

Women in Civil Engineering: Continuity and Change

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ABSTRACT

This thesis explores the career experiences of women civil engineers in the UK and examines how women negotiate their place in a highly male-dominated profession. The thesis considers why women are under-represented in this profession, are rarely appointed to senior management positions and how changes in the business pattern of UK engineering consulting companies has created barriers or opportunities for women.

Uncovering the detail of women's career expectations and experience was more suited to a qualitative approach to data collection. A series of semi-structured interviews was carried out with thirty-one women engineers working in different sectors of the profession. The women were in a variety of personal circumstances, including single and married women, some with young children and others with no dependent caring responsibilities. The ages of the women ranged from twenty three to fifty six years with the majority having attained chartered status. The interviews focused on factors that affect career progression and these were discussed within the three themes of subcultures of the profession, work/life balance and possible agents for change. Quantitative membership data from the Institution of Civil Engineers (ICE) and other construction professions has been analysed to provide the context for the research.

Feminist concerns about the relationship between women's role in the private sphere of the home and the public sphere of paid work have led to a theoretical framework that draws mainly on the work of Walby and Cockburn. This has been enhanced by Greed's gendered critique of the wider construction sector. The findings show that women feel isolated within the profession and this isolation seems more pronounced for the few women who reach the top and also generally in the setting of the construction site. Despite attempts by some contracting firms to reform the culture of construction sites, this sense of isolation is heightened by problems of harassment in that setting. Thus, for many women the prospect of working on site is still very daunting. Equal opportunities policies have a low profile in the industry and this research shows that women working as professionals in construction do not see 'equality' measures of this type as likely agents for change.

The image of the profession as predominantly a 'male preserve' continues, and the ICE is regarded as a 'very male club' which admits women only reluctantly. Although women report feeling marginalised within the profession many receive personal support from individual male and female colleagues and this factor can be critical to their career progress. Moving into management is seen as necessary for career success but some women are ambivalent about the negative impacts this may have on work/life balance. The culture of long hours is dominant and this marginalises women with caring commitments and reinforces male hierarchy within the profession.

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CONTENTS

		Page
CHAPTER ONE	INTRODUCTION <i>Research aims; Participation rates of women as engineering professionals; The origins and main concerns of the study; Research Methods; Outline of Chapters</i>	1
CHAPTER TWO	CIVIL ENGINEERING IN THE UK <i>Civil engineering - a construction profession; Professional female participation rates in civil engineering; What is a civil engineer?; Professional/occupational careers versus organisational careers; How the UK civil engineering profession is organised; Work practices; Management; Perspectives on change within construction and civil engineering; Industry initiatives; Company case studies; Conclusion</i>	14
CHAPTER THREE	WOMEN IN THE LABOUR MARKET <i>Introduction; Some historical perspectives on work; Public and private patriarchal structures; Subcultures; Work/life balance; Agents for change; The issue of management; Conclusion</i>	47
CHAPTER FOUR	METHODOLOGY <i>Introduction; Theoretical perspective and participant selection; Developing the interview schedule; The interview process; Data analysis; Conclusion</i>	89
CHAPTER FIVE	PARTICIPANT PROFILE <i>Introduction; General summary of the participant profile; Detailed participant biographies; Conclusion</i>	111
CHAPTER SIX	SUBCULTURES <i>Introduction; Stereotypical expectations; Construction sites; Professional status – the role of the chartered engineer; The function of the ICE; Management; Conclusion</i>	131

CHAPTER SEVEN	WORK/LIFE BALANCE	169
	<i>Introduction; Long hours culture; Overseas working; Work/family conflict; Sources and consequences of pressure; Balancing strategies and factors; Conclusion</i>	
CHAPTER EIGHT	AGENTS FOR CHANGE	194
	<i>Introduction; Influences on career choice; Equal opportunities; Role models and mentoring; Networking; Conclusion</i>	
CHAPTER NINE	CONCLUSIONS	231
	<i>Introduction; Subcultures – Visibility – Career progression – The image of the Institution of Civil Engineers - Summary; Work/life balance – To manage or not to manage? – Flexible working – Overseas working - Summary; Agents for change – Equal opportunities policies – Support networks – Summary; Conclusion</i>	
APPENDIX I	<i>Participant Profile – Age, Family Circumstances and Professional Position</i>	250
APPENDIX I I	<i>A research study - The Career Experiences of Women Civil Engineers in the UK</i>	253
APPENDIX I I I	<i>Research study - participant details</i>	254
APPENDIX I V	<i>Researching the Career Experience of women civil engineers in Britain - discussion issues and interview prompts</i>	255
BIBLIOGRAPHY		258

CHAPTER ONE

INTRODUCTION

1. Introduction and research aims

Civil engineering in the UK has experienced great structural change over the past ten years in response to the shrinking size of its traditional market and the commercial realities of globalisation. The need to adapt to a new business climate has coincided with a shortage of entrants to the profession and has resulted in an associated drive to encourage greater numbers of men and women to join this and other construction professions. Some of these measures have been directed particularly at women but have failed to attract them in significant numbers. Promises of an exciting and varied career with opportunities for travel and promotion do not seem to have persuaded many women to join the industry and this research offers insight into why these incentives have not been successful. Civil engineering thus continues to be strongly male-dominated and operates in a 'masculine' environment dominated by conflict and crisis management (Langford et al, 1995).

The overarching aim of the research, therefore, is to explore the changing position of women within the civil engineering profession. The research concentrates attention on the specific problems women encounter working as professional civil engineers within UK construction. This adds to existing knowledge concerning women in a range of manual, technical, administrative and other professional occupations within the sector and highlights particular structural and organisational issues affecting their progress.

The study focuses on civil engineering within the context of the wider construction industry and the involvement and progress of women in professional roles within the sector. The research explores the career experiences of women within the profession, identifying factors that have acted as enablers and constraints to their progress. These aims lead to specific research questions.

- which factors have specifically helped or hindered the individual progress of women
- to what extent have women been able to make career advancement within the profession
- how has the profession changed and what in particular would improve the profession for women

Much of the research design was concerned with investigating factors that might deter or encourage women's entry and progress and this relates to the first two research questions. These factors are broadly categorised within three thematic strands: subcultures, work/life balance and possible agents for change. In relation to constraining factors the research was directed at understanding how women perceived these difficulties or whether indeed they experienced them as barriers at all. There are a number of variables that can explain success and gender is just one of them. A concern with the extent to which the women identified with this particular variable as a predictor of their progress underpinned the construction of many of the interview questions.

The study discusses how modern civil engineering has adopted a stronger managerial focus within a changed global market and addresses the related issue of professional progression and the perceived requirement to move into a management role to achieve high status. This is linked to the third research question which considers how women's career paths are affected by these changes and particularly whether women want to assume greater levels of decision-making responsibility and are prepared to do this on the terms already in place. Discussion of how the profession could be improved for all those within it, with emphasis on areas of particular concern to women, is a key focus of the study. This discussion raises the question of whether the absence of women amongst the senior positions within the industry results from exclusion or preference. The debate is concerned with management styles and practices and considers whether women manage differently from men.

Reflecting on the juxtaposition of female roles at home and in the workplace, the emphasis on women's role in the former was of particular interest as a potential obstacle to progress. Cockburn (1991) suggests that women are still '*defined in domesticity*' even if they are unpartnered, childless, beyond childbearing age and clearly aimed at a high-flying career. One impact might be that 'fast track' women have to work twice as hard as similarly ambitious men, at confirming their competence and eligibility for advancement. Of primary interest is whether women civil engineers themselves identify with these possible explanations of their continued secondary position within the industry.

2. Participation rates of women as engineering professionals

Civil engineering is still an unpopular career choice for women especially when compared with other once male-dominated professions like law or accountancy.

Research published by the Department of Trade and Industry (DTI) in November 1998 shows that just 15 per cent of full-time science based jobs are carried out by women (NCE, 19 November 1998:18). The DTI seems to attribute the problem to one of image and perception. In its study, fourteen and fifteen-year-old girls were asked for their impressions of science and engineering. Their responses focused on the remoteness and impersonal nature of science teaching that made them feel alienated. Personal creativity, working within a supportive social environment and dealing with human beings, were highly valued by the girls, but these qualities were seen as lacking in science and engineering. It could thus be argued that women may choose to work in the social, health and service sectors because they provide a better fit with women's perceived needs and wants. Their under-representation in the science and engineering fields, therefore, may be due less to exclusion and relate more to choices based on a value orientation influenced by convention and stereotype.

The WISE (Women in Science and Engineering) initiative mounted by the Engineering Council has had some success in at least bringing the issue to public notice. The campaign works on several fronts promoting to girls and young women the excitement, job satisfaction and financial rewards (potentially greater in civil engineering than in some traditionally 'female' careers such as nursing, for example) that engineering careers can offer. WISE's message is one of global focus; the worldwide demand for increased innovation and productivity requires the best knowledge and abilities regardless of gender. Influenced by both the WISE programme and shortages of skilled staff, several civil engineering consultants have run workshops for staff on a number of 'equality' themes aimed at promoting the idea that equality and diversity can enhance business. These initiatives were also in response to the external wider commercial stimuli for change that at the same time acknowledged both the benefits and the problems in changing the traditional ethos of the profession.

Although it is difficult to evaluate the success of the WISE campaign, there is some evidence (including from this research) that the marginal increase in the relative and absolute numbers of women taking up careers in the fields of science and engineering may be attributed to this initiative, though, overall, women still appear to be discouraged from entering civil engineering. Currently women comprise just under five per cent of the Institution of Civil Engineers' (ICE) overall membership (see Table Two, Chapter Two). Admittedly, this is an advance on nine years earlier when the

figure stood at just 3.5 per cent. Possibly the WISE campaign can claim responsibility for some of this increase but it certainly cannot claim to have turned the tide. The influence on career choice of these formal encouragement programmes has been considered as part of this study.

The ICE is participating in wider activities to promote civil engineering to both men and women and aims to get young people interested in the profession when they begin secondary school (NCE, 21 June 2001:18). A new magazine, 'NCEinsite' is being distributed to schools; there will be one issue per term which will include a topical round up of news and innovations from around the profession, highlighting case studies and projects from all over the world. Publication of the magazine was driven by the need to tackle the falling numbers of school leavers entering the profession either directly or via university or college courses. While there are many reasons for the continuing recruitment problems within the industry, much of the problem is thought by senior industry figures to stem simply from a lack of useful information about what a civil engineering career can involve. The summer 2001 issue characterises civil engineering as offering adventure, variety and good travel opportunities. The issue of pay is not mentioned; this may be due to the widespread view that it is a relatively low-paid profession.

In using the term 'overall' membership, it is helpful to note that the ICE currently operates different grades/levels of membership though changes are underway to create a more unified membership category. A breakdown of membership statistics by category reveals a trend regarding the professional progress of women. In 1998 thirteen per cent of student members were women but women only comprised 2.5 per cent of full chartered members. Similarly only 0.2 per cent of the Institution's Fellows (a category of outstanding recognition) at that time were female (NCE, 19 November 1998:19). This raises the question as to why more of the women student and graduate members do not progress in their careers and assume greater levels of professional or accredited status.

Helen Stone, who sits on the Construction Industry Council's Equal Opportunities Task Force, writing in the NCE, says that she is encouraged by the growing numbers of women in civil engineering:

"When I started out twenty five years ago, it was very rare to be working with another woman. I was the first woman in my firm to go on site. Female members of the ICE

would double roughly every five years from a tiny starting number. The rate of growth has levelled off in the last few years and is now about 15 per cent at the undergraduate level but a lower percentage of overall membership” (NCE, 19 November 1998:19).

The NCE 1998 salary survey shows that in salary terms there is evidence that women entering the profession are paid at least as well as their male colleagues. Of more concern are the problems faced by women trying to climb the career ladder. The salary survey shows that women earn on average 18 per cent less than their male counterparts in the middle ranks of the profession. By 2002 the gap had increased to 35 per cent (see Chapter Two). These figures are consistent with the findings of a US study by Judith McIlwee and Gregg Robinson (1992) looking at the relative progression of male and female engineering graduates. They found that female graduate engineers leaving college found well paid jobs with salaries at least as high and in some cases higher than their male counterparts but within ten years they occupied lower status positions than the men. The main explanation for this widening gap was that significantly more men were promoted to managerial positions than women. The experience for the women, then, had been one of relative downward mobility (McIlwee and Robinson, 1992). It seems that with greater responsibility the gender pay gap in the industry widens. Thus, Stone comments that *“boards of companies made up mostly of men have a habit of cloning themselves, especially in the private sector”* (NCE, 19 November 1998:19). Referring back to the question posed earlier, it would seem that from the financial aspect it could be argued that for women, civil engineering might not offer the most promising career opportunities.

3. The origins and main concerns of the study

This research project arises from my association over many years with the civil engineering profession, working as a contractor organising continuing professional development (CPD) events in the form of training courses, seminars, workshops, study tours and international conferences for civil engineers. Observations made in my professional role concerning the very small number of women attending CPD events led me to consider the continuing ‘maleness’ of the profession. Representations of civil engineering in the media suggest that men constitute the ‘norm’ in relation to professional practice. They are pictured as designers, managers and decision-makers. But, although men are the dominant ‘face’ of civil engineering, increasingly women are adding their contribution to this image though their progress remains slow. As Eisenhart

and Finkel (2001:13) point out “*the gap between men’s and women’s success, especially in elite science and engineering, remains significant*”.

The principal purpose of this study, therefore, is to explore the process of change within the profession to gain an understanding of why women appear so marginalised. Gender has formed the key focus of the study though the impact of diversity issues more generally is relevant, particularly in light of the ICE’s initiative to modernise the profession as part of a drive to maximise human resource potential.

This investigation began as a pilot study for a postgraduate dissertation that focused on the process of becoming a chartered civil engineer and the effects of gender on the relative success rates of men and women (Watts, 1995). It was clear that the work could be broadened to include a range of theoretical, structural and organisational issues about the civil engineering profession as a whole focusing on how the industry has changed and the impacts on women within it. The pilot study discussed the teaching of numeracy and science and the ways in which this confirms gendered stereotypes that discourage young women from pursuing science and engineering careers. This confirmed the view of Lightbody and Durndell (1998) that academic subject choice is a socialised process subject to a range of influences and expectations amongst which are occupational choices.

This research, however, begins with women who have chosen a career in civil engineering, and is based on their accounts of work experiences and related life choices. The purpose of this approach was to gain a deeper understanding of the organisational structures and cultural practices that underpin the profession and of the strategies that women pursue to confirm their professional identity in what seemed to me to be incredibly ‘male’ spaces. Within this male territory, women, as a category, tend to fill the lower ranks at a disproportionate rate compared to the numbers of women entering the profession. Understanding the nature of this disadvantage/differential treatment and some of the ways that this could be amenable to change is an overarching research aim. This raises a complex set of issues that include personal and organisational behaviour, role stereotyping, value systems, cultural frameworks and power distribution within groups. This study then is about women civil engineers both in terms of their individual experience at work and as members of a minority group within a strongly ‘male’ defined occupation.

There is limited material in the literature specifically on the topic of civil engineering and much of this relates to civil engineering within the broader context of construction. The literature review, therefore, concentrates on relevant associated themes such as employment trends, organisational behaviour, workplace culture, career patterns, issues surrounding management and critical commentaries on contemporary gender relations. The women who contributed to the study told their stories and these accounts have been set within this wider empirical framework from a feminist perspective.

A feminist theoretical perspective argues that gender is socially constructed and has as its focus the differing roles that men and women are expected to fulfil in society. In particular, it concentrates on the different perceptions of the work undertaken by men and women. Underpinning men and women's different relationship to the labour market is the concept that men's work is generally accounted for in economic policy calculations whilst women's work, which is seen as primarily linked to the private sphere, (particularly in reproducing the family) is largely unrecognised, undervalued and often made invisible. Gender was seen not simply as a matter of individual characteristics or identity, but rather as a source of social identity and power that involves relations of domination and oppression. Specifically for this study I wanted to examine the cultural norms that the language and practice of gender difference has brought to the practice and development of engineering which continues to reinforce this as a highly male-dominated activity.

Civil engineering takes its discipline base from mathematics and physical sciences that are often characterised as 'male' subjects within the academy. The feminist scientist Evelyn Fox Keller has contributed to the debate about the gendered stereotyping of science. Her critique of how science operates and whose interests it serves has revealed that scientific knowledge is not 'pure', 'objective' knowledge, but rather it is the product of a range of cultural and social processes which themselves are value laden.

"Analysis of the relevance of gender structures in conventionally male worlds only makes sense once we recognise gender not only as a bimodal term, applying symmetrically to men and women (that is once we see that men too are gendered, that men too are made rather than born), but also as denoting social rather than natural kinds" (Keller, 2001: 133).

It was not only feminist writers who recognised that the knowledge produced within the natural and physical sciences was in fact social process as much as it was scientific process. Thomas Khun (1962), writing as social historian and philosopher, explored this

theme and charted how the production of scientific knowledge is subject to cultural and social influences, and its claim, therefore, of universal validity based on objective experimental method, cannot be substantiated.

A starting point of the research, therefore, was consideration of the ways in which dominant ideas about men and women shape their life histories and career chances. Observations of how the civil engineering profession operates indicate that the issue of 'equal' opportunities is a key one for this project (NCE, 3 February 2000). Whilst formal equal opportunity and sex discrimination legislation has now been in place for more than twenty-five years (the Sex Discrimination Act of 1975 made both direct and indirect discrimination in employment on the grounds of sex unlawful), its implementation by employers often does little to eradicate more informal forms of discrimination which operate in the workplace to limit career development for many women and some men, too (Alvesson and Billing, 1997). The continuing under-representation of women on the boards of 'blue chip' companies, is one example. This legislation could be said to have changed the public face of what is acceptable in the workplace, but in practice the difference between 'formal' and 'substantive' equality continues to be of concern (Bradley, 1999). Recognition that material issues such as caring responsibilities effect women more than men lies at the heart of this 'opportunity gap'.

There is recognition that women are not well represented amongst the scientific and engineering staff of the civil engineering consulting firms. Several of these companies, aware of this project, offered their support by making available to me female members of staff for interviewing (summary details for these women are given in Appendix I) as well as information about the work and management profile of their organisations.¹ The mainstream industry weekly journal 'New Civil Engineer' (NCE) in November 1998 ran a major editorial piece about women in construction (NCE, 19 November 1998:18-22). The article entitled 'Changing the Gender Agenda' discusses why so few women civil engineers take up positions in construction and includes an account of one woman's experiences of working on a construction site. It suggests that problems of being made to feel on the fringe of activities, sexual harassment and straightforward hostility (verbal abuse) were regular occurrences. Practical difficulties such as a forty-minute round trip to a Ladies' toilet simply added to the stress. This raises concerns

¹ See Acknowledgements

about whether women should enter these traditional male-dominated professions because of the particular personal and social difficulties that they face in establishing themselves within these territories colonised by men.

Discussion of gender politics within the industry is a relatively recent development and often a contentious issue. Articles on the state of the profession, focusing on women's role within it, are capable of eliciting reactionary responses such as that included in the letters page of a November 1998 issue of the NCE, where a male engineer from County Durham advises women to stick to their strengths, claiming that:

“only a female chauvinist would proclaim that the profession would be improved if more members were female. It is evident the magazine wishes to go further, and cajole women into a job which most have shown themselves to be as unsuitable as a male midwife. It is just as harmful (if not more so) to pressurise people into seeking employment for which they are not suitable, as to dissuade them because of sexual stereotype” (NCE, 26 November 1998:14).

Although there is now greater discussion about women's professional role within construction, women are still conspicuous by their absence.

4. Research Methods

This study is mainly based on qualitative methods focusing on women's personal accounts to provide direct and engaging insight into first-hand experience of how it feels to work within this strongly male defined profession. Semi-structured interviews were considered to be the most effective way of achieving this in-depth view and were preferred over other methods such as, for example, a questionnaire survey based on larger samples. I describe my methodological concerns and practices in greater detail in Chapter Four but now briefly summarise the key elements of this approach below.

(i) Literature review

The first element is a literature review that begins with a critique of women's general position within the labour market from a feminist sociological perspective. A summary of women's experience of working in male-dominated professions follows. This has provided the framework for the last part of the review that looks specifically at women's technical and professional role within science and the built environment sector that form the context of civil engineering.

(ii) Review and interpretation of statistical information from professional bodies within construction

Quantitative data about women's membership of professional bodies within the construction sector was examined to give a clear picture of their representation within the industry. A particular focus on the data from the ICE analyses trends in the numbers of women entering civil engineering and the proportion attaining professional chartered status. With a growing skills shortage reported in the industry, the issue of 'fall out' rates seems relevant but this is beyond the scope of this study.

(iii) Qualitative semi-structured interviews

In order to do justice to the complex nature of the research questions to be investigated I chose a mainly qualitative approach to the data collection. Interviewing of thirty-one women civil engineers formed the main tool of this investigation. The interviews were semi-structured and involved a range of women currently working in the industry with differing status and family backgrounds and responsibilities. These interviews explored the factors that they perceived to have enhanced their career and those which may have obstructed it (including both their domestic circumstances and their working environment). Interviews included a discussion of their ideas about how the profession could be changed to attract more women and improve their career prospects. Interviewees were identified through existing contacts within the industry. Approximately a quarter of the women interviewed were in middle and senior management positions. Some women could be considered to be industry leaders, in terms of their profile, and this presented me with the particularly difficult challenge of retaining confidentiality in these cases. As well as 're-naming' all the women, I have been careful not to include detailed information about individual work histories or identify high profile projects with which some have been associated.

5. Outline of Chapters

Understanding how civil engineering in the UK is organised is essential to give meaning to the research findings and **Chapter Two** sets out to describe the profession's origins and modern day development. This chapter begins with membership data from the key professional bodies within the built environment sector and focuses particularly on the membership size and grade structure of the ICE. This contextualises the general information about the profession that forms the main part of the chapter.

Consideration is given to the contemporary role of civil engineers outlining the most common tasks and job functions. The ways that these functions are performed in different settings are discussed, together with some of the possible gender implications. The impacts of globalisation on employment trends, training requirements and career opportunities are discussed. Changes to management practice within the profession receives attention demonstrating the variety of roles and job titles that comprise this function and how management is increasingly recognised as quite a separate specialism rather than just an extension of technical expertise. The chapter concludes with three company case studies each selected to illustrate aspects of organisational and commercial change within the industry and the possible effects of this change on employment practices in general and the position of women in particular.

The theoretical framework of the research is the subject of the literature review outlined in **Chapter Three**. The review includes books, articles and papers in both academic and professional journals as well as some 'grey literature' sources; these comprise reports and commentary from organisations within the profession as well as trade press material and editorial from national newspapers. Reference has also been made to published information from organisations such as the Equal Opportunities Commission. Its underlying focus is women's relationship to the labour market based on a critique of the feminist debate on public and private patriarchal structures drawing particularly on the work of Walby. Discussion of Cockburn's work on corporate organisational structures and the impact of job segregation introduce the concept of *subcultures* within the workplace. This forms the first of three central themes. The particular features of subculture within male-dominated professions are discussed and these issues are developed in light of further work that has examined the role of subculture within construction against the background of the theoretical framework offered by Greed (1991, 1998, 2000, 2001), Langford et al (1995) and Evetts (1996).

The second key theme is *work/life balance*, particularly in relation to how choice is exercised by men and women in the workplace to create acceptable boundaries between work and leisure time. Cockburn's (1991) and Hakim's (1991) contrasting explanations of how choice is socially constructed to produce different outcomes for men and women in their role as paid workers is discussed. This leads to consideration of how change might occur within the profession. *Agents for change* is the third key theme focusing on strategies such as equal opportunities, 'bottom-up' and 'top-down' change, 'critical

mass' and flexible working. The degree to which the rationale for equal opportunity action can be misunderstood to mean action that advantages women and disadvantages men, instead of its intended aim to create a 'level playing field', is considered. The work of Greed (1991), Court and Moralee (1995), Bagilhole, Dainty and Neale (1997a&b) and Michielsens et al (2001) informs this section.

The chapter closes with a review of the literature on the gendered relations of management and suggests that management may have a subculture of its own. The view of Holton (1998: 162) that "*though women today in the UK have an equal right with men to choose a management career, it is clear that they do not yet have an equal chance to succeed*" summarises the theme of the debate.

The complexity of these issues dictated the research methods and these are outlined in **Chapter Four**. The aim of uncovering women's experiences as professionals within formerly exclusively male spheres suggested that a mainly qualitative approach to the data collection would be the most appropriate. Statistical information about the quantitative representation of women in the profession and their rates of progress is important for contextual reasons and these are examined within the chapter. The development of the interview schedule and the detail of the interview process comprise the final sections. The chapter that follows introduces the research participants and is intended to establish the context for the next three chapters that discuss the findings of the study. **Chapter Five** thus begins with a general summary of the group situating them according to age, personal circumstances, sectors of work and professional status. The second part outlines the individual biographies of the thirty-one participants and emphasises particularly significant features of their accounts.

The qualitative data was analysed thematically based on the structure of the interview schedule and a number of key findings emerged. The discussion of these themes (subcultures, work/life balance and agents for change) has been broadly organised within the theoretical framework identified earlier. The theme of **Chapter Six** is subcultures. These comprise the range of attitudes, behaviours, expectations and practices that make up civil engineering. It considers these in the context of different settings and processes, namely construction sites, the institutional framework of the ICE that regulates chartering procedures and the management setting. The chapter begins by discussing 'image construction' within the profession, particularly how women are expected to conform to a traditional 'male' norm. A critique of construction sites and

how women deal with working, often as the only woman, in this particular environment follows. The chapter concludes with a commentary on management practices within the industry, concentrating on organisational behaviour and the impact on gender relations of corporate culture in the workplace.

This discussion gives rise to issues concerning the boundary between work and non-work time. Work/life balance is the theme of **Chapter Seven** which deals with issues that were of great concern to a majority of participants. The particular problems associated with the culture of construction that assumes full flexibility and availability of its workers are discussed together with working practices that do little to help women combine working life and family life. The perceived 'stigma' of part-time working is the subject of extensive comment by interviewees and the difficulties of being a part-time manager receive particular attention. Lastly, this chapter discusses a range of balancing and support strategies. These reveal that participants rely on a plethora of privatised solutions to help manage the running of their households.

Chapter Eight discusses change within the profession, focusing both on quantitative and qualitative aspects. It includes a range of possible 'agents for change' including structured encouragement initiatives, individual support mechanisms and equal opportunities. In particular, the role of equal opportunities in affecting transformative change is considered in light of Cockburn's (1991) theoretical framework outlined in Chapter Three.

The key findings of the research are discussed in **Chapter Nine** within the three themes of subcultures, work/life balance and agents for change identified earlier. The chapter discusses limitations on change. Although some quantitative change has occurred in the numbers of women entering the profession, qualitative research revealed that significant problems remain for women. Specifically, the chapter includes some general comment concerning the dearth of recognition of the leadership role that women can play within the profession both in the consulting and contracting sectors. Concerns about the perceived gender inequalities that exist within some professional accreditation procedures are highlighted. The chapter discusses the tension between the policy and practice of equal opportunities and the selective nature of some personal support strategies adopted by women to further their careers and improve work/life balance.

CHAPTER TWO

CIVIL ENGINEERING IN THE UK

1. Civil engineering – a construction profession

Civil engineering is one of a number of built environment professions serving the construction industry within the UK. It operates alongside town planning, structural engineering, architecture, surveying and building engineering as part of a huge industry employing around 1.3 million people (Greed, 2001:4). All these professions have 'building' as their context and are still highly male-dominated with women poorly represented, particularly at senior levels. Table 1 below gives details of membership of the construction professions with civil engineering shown as the second largest behind surveying.

Table 1: Women's representation in professional bodies
Figures for Summer 2002

Professional Body	Total Membership	Women Members
Royal Institute of Chartered Surveyors	107,817	11,173
Institution of Civil Engineers	78,641	3678
Chartered Institute of Building	37,511	1181
Royal Institute of British Architects	28,328	2858
Institution of Structural Engineers	20,173	950
Royal Town Planning Institute	17,924	4714
Totals	290,394	24,554

Source: unpublished figures supplied by membership departments of each institute

These professional bodies have as a core aim the promotion and protection of their specialist expertise which is grounded in professional education programmes that have tended to concentrate on the development of graduate entrants (Druker & White, 1996: 127). The need to provide evidence of learning, competent practice and a commitment to professional values characterises the route to accreditation with these bodies. Charting the differing detail of the various stages for accreditation within each profession is beyond the scope of this research but a common pattern is the poor representation of women (a little over 8% of the total). These professional structures remain strongly male-dominated and have reinforced male cultures within construction.

Aside from subscribing to an underpinning set of 'professional' values that provide a framework for practice, there also exist a set of 'other' values or attitudes within construction that are predominantly male and have to be 'bought into' to ensure inclusion. These are the social processes of attitudes and belief systems that Greed (1992) has characterised as subculture. This behavioural and attitudinal framework operates outside the formal structures of the profession, is often less tangible and is difficult to measure. Any discussion of the 'practice' of civil engineering has first of all to take account of its general context (which is construction) and secondly must address its particular subcultural features which, together, make up its professional identity. An understanding, therefore, of what is meant by the concept of subculture, is necessary to provide the social context of the formal activities and structures that make up the profession.

Greed's critique of subculture originated with her early research into the position of women in the surveying profession but was later extended to the broader construction context. Initially her enquiry focused on the objective issues connected with professional structures and the education process but increasingly her investigation led her to factors operating beneath the surface of this seemingly rational and objective world. She found that surveying had its own set of attitudes and cultural traits that operated to foster the career progression of some of its members whilst blocking that of others. The concept of 'fitting in' or being the 'right type' appeared to be particularly instrumental with gender as a major factor in understanding who receives what type of treatment (Greed, 1992: 203). These are highly subjective factors and some are essentially territorial in nature with those at the heart of the subculture striving to maintain the dominant values against dilution from anyone who is different. Whilst social factors such as race and class impact on who takes up these professions (for example there are very few black and minority ethnic surveyors) the male subculture remains dominant so that women in these roles are often characterised as 'strange', 'exceptional' and even as 'deviant'.

Identifying these factors gave structural meaning to the personal experiences of the women in Greed's study so that the day-to-day incidents of harassing humour, innuendo, snide remarks, patronising encouragement as well as positive encouragement could be seen as part of the subcultural infrastructure. Greed argues that although it is easy to dismiss these occurrences as 'minor irritants' or 'trivial'

they, in fact, form the very substance of the subculture that has a profound impact on women's careers and personal lives.

Construction, as Table 1 demonstrates, is an interdisciplinary process with some or all of the above professions contributing expertise at various stages. Each profession has its own set of cultural traits which informs both its practice and image (architects, for example, are seen as creative designers and positioned at the sophisticated and more glamorous end of the building cycle with civil engineers characterised as elite applied designers). Greed notes that even the concept of design is culturally mediated by the context within which it is undertaken. For example, the design expertise of architects is perceived as creative flair whilst the design work of civil engineers is seen in more negative terms because it is often associated with minimising what can go wrong (Greed, 1998). However, whatever the nuances of each subculture, because women are in a minority their experience at work will be that of those marginalised on the perimeter of the subculture of all of these groups. This is because the subcultures have been developed by men and sustained in their interest. Greed argues that in practice the main effect is to keep women out of decision making positions.

2. Professional female participation rates in civil engineering

Before outlining the various roles and tasks that civil engineers might expect to undertake during their career, it is helpful to have a sense of the extent of women's representation within the industry. Civil engineering in the UK continues to be a very male-dominated profession as Table 2 indicates.

Table 2: ICE membership by grade

Grade	Current Totals	Current Women
Affiliate	666	28
Associate Member AMICE	312	22
Associate Member IEng AMICE	3,558	119
Companion	28	4
Fellow	6,221	24
Graduate	15,533	1457
Honorary Fellow Corporate	5	0
Honorary Fellow Non-Corporate	25	2
Member	42395	1058
Student	9261	927
Technician	637	37
Totals	78,641	3,678

Source: unpublished figures supplied by the ICE on 23 January 2002

The entry sequence into various grades is as follows: students enrolling on undergraduate civil engineering degree courses are eligible to join the ICE as

'student' members. On obtaining their degree they can cease their membership altogether or transfer to the 'graduate' grade. Once chartered status has been achieved they can progress to the 'member' grade. The status of 'fellow' is awarded as a mark of recognition of long experience and contribution to the profession. In the figures detailed in the above table women comprise 4.7% of the total membership but there are significant variations across the different grades. Within the 'student' category women make up 10% of the total and 9.5% of the 'graduate' grade. Women represent 2.5% of the 'member' category but only 0.38% of the 'fellows'. This raises the question of why the proportionate rate of women's representation is not sustained at the same level amongst the 'higher' grades. In further information supplied by the ICE it is possible to trace low conversion rates of women from the 'student' and 'graduate' grades to 'member' and 'fellow' as detailed in Table 3.

Table 3 shows the rate of women taking up ICE membership by grade in each year during the period 1996 to 2001. (For example the figures for 1996 are on the basis of women who 'joined' each grade between 01/01/96 and 31/12/96). If the average time taken to become a chartered engineer is five years then the figures demonstrate that the conversion rate from the 'graduate' grade to 'member' grade is very low at less than ten per cent, indicating that many women do not progress to become professionally qualified civil engineers. One of the central aims of the thesis is to investigate the possible causes of the under-representation of women within the senior echelons of the profession.

Table 3
Actual numbers of women taking up membership of the ICE in each grade

Grade	1996	1997	1998	1999	2000	2001
Affiliate	5	12	2	3	0	0
Associate member	2	3	1	3	0	0
Companion	1	0	0	0	0	0
Fellow	1	0	1	1	1	1
Graduate	150	210	134	124	107	90
Member	14	2	9	8	23	6
Student	100	225	220	437	393	206
Technician	2	1	1	0	0	0
Totals	275	453	368	576	524	303

Source: unpublished figures supplied by the ICE on 23 January 2002

The next section discusses how the profession is organised and the changes that have taken place to the way that modern civil engineering is carried out. This discussion illustrates the diverse nature of the role.

3. What is a civil engineer?

To understand how civil engineering in the UK is organised it is useful to have some appreciation of the roles and functions performed by civil engineers and the different kinds of day to day working environment within which these tasks take place.

The main sectoral activities covered by the profession include: design and construction of transportation infrastructure such as roads, railways, bridges, ports, harbours and airports; building construction with building broadly defined as commercial buildings, homes, educational and medical buildings, warehouses, hotels and public buildings; the water sector including dams, flood defences, reservoirs, water mains, treatment, irrigation, pumping stations and desalination plants; sewerage; waste including handling, treatment and removal of solid, liquid, chemical, toxic and nuclear wastes; power including power stations, hydroelectric dams, transmission lines and substations. The list is a long one and because of the wide range of specialist activities covered by civil engineers, the profession is often seen as attractive in providing diverse career opportunities. Within these sectoral activities there is also a diverse range of technical specialisms. Thus engineers may specialise in geotechnics, transport modelling, structural engineering (steel and/or concrete), hydraulics or public health engineering.

These functions are delivered by a complex mix of technical and managerial tasks. They include office, laboratory and site work, designing, draughting, report writing, bid preparation, computing, supervising, attending meetings, internal liaison, client presentations, modelling, planning, testing, experimenting, predicting, budgeting and decision making. High professional standards are vital because often projects are ultimately concerned with ensuring the safety of human life. Civil engineering, like many other professions, is today a computerised business and many of the older members of the profession have had to learn new skills in this area. Traditional methods of making calculations and preparing estimates have been replaced by sophisticated suites of computer models designed to increase accuracy, and minimise the risk of errors that can often turn out to be hugely expensive. Being a computer 'whizz kid' is often characterised as the expertise of the young and some older engineers feel that some of their autonomy and authority has been undermined by this wave of

computerisation sweeping across the industry. Some even have had to undertake special training to develop new skills to keep pace with this transformation.

There have been other changes to the core role. Research conducted by the NCE points to the emergence of the urban engineer dealing with operational and maintenance infrastructure problems moving away from a traditional design and construction role (NCE, 11 November 1999). This raises the question of what makes the civil engineering discipline unique in a society with a mature infrastructure and suggests that the nature of the discipline may radically alter in the future. There is a sense of a profession at the crossroads with increasing commercial pressures moving engineers into roles that are neither technical nor specific to civil engineering.

Increasingly, engineers bring more than just a set of scientific and technical skills to their work. They have to make complex decisions about the interpretation of data, about which lines of investigation to pursue and what to exclude. They have to decide how best to work with others and exchange information. These are matters of professional judgement and they contribute greatly to how engineering solutions are produced. Civil engineers working within a creative framework operate within the constraints of organised social arrangements and are increasingly being held accountable for their decisions. In this context, many of the specifically non-specialist (in the engineering sense) skills required by civil engineers such as literacy, social awareness, time organisation, team building and communication have to be learned outside the confines of the discipline itself as occurs within other professions. Thus there has been a proliferation of general business advisers/facilitators in the industry to promote greater efficiency and sharper project management with much of this driven by the perceived need to be client focused (NCE, 11 November 1999). This has encouraged a more multi-disciplinary approach to the business with a recognition that a world class engineer does not necessarily make a good people/project manager nor a good practice teacher. In this sense the profession over the past few years has become more outward looking, ready to absorb the contribution of a wide range of specialists to delivering the business. The increased industry dependence on computer technology is a good example and the move of some contractors into project and facilities management is another.

For many civil engineers who are now approaching the end of their careers their professional identity has been forged within one or two organisations reflecting the

image of 'company man or woman'. Because of structural changes to the industry already noted this seems a more unlikely option for new entrants to the profession.

4. Professional/occupational careers versus organisational careers

Julia Evetts (1996), writing about the juxtaposition of gender and career in the science and engineering professions, has looked at how the opportunities for professional progression have changed. Her focus has been on career both as an organisational process (progression within a single company) and as an occupational route with the emphasis on moving from employer to employer and also on gender as a variable in career experiences and organisational practices (Evetts, 1996). This dual focus has particular relevance to civil engineering, which has developed in the UK in quite a culturally specific way. With the establishment of family-based practices and partnership arrangements new recruits were directed towards developing a range of technical and managerial skills so that through a succession of jobs they could move into positions of increased responsibility and seniority within the firm. These recruits were not always graduates as companies were keen to develop a range of expertise and appropriate training opportunities were thus offered on a number of technical and professional levels.

However, in civil engineering, as in many other professions, the prospect of a job for life has now virtually disappeared. In former times it was the practice of most of the leading consulting firms to focus their professional recruitment on taking the brightest graduates and then providing a broad introductory training laying the foundation for specialisation as a way of climbing the career ladder. This investment had a dual effect: for the employer it often led to high levels of staff retention with the positive benefits of continuity as a good return on the investment and for the employee it offered a long term job often resulting in promotion to the position of partner or associate. In this environment many companies received loyalty and a high level of commitment from their employees resulting in low staff turnover. Dainty's (1999) study demonstrated that this loyalty strategy had been well rewarded for men with organisational loyalty being more likely to result in rapid vertical progression. Thus men preferred to remain with companies within which they had built up a large amount of human capital, where they felt comfortable and understood. Continuity of service was thus a major factor in their progression. In contrast to this most women in Dainty's study believed that inter-organisational mobility was essential to circumvent

the barriers obstructing their progression. However, further research suggests that women are disadvantaged by such personal choices, particularly their mobility between companies can slow their development in terms of management succession (Dainty et al, 2000). This apparent inconsistency illustrates the 'gap' between the perception by women that organisational mobility enables progression and the reality that staying in a post is more likely to result in upward career development. The continuing skills shortage within civil engineering may radically alter career paths for both men and women as companies have to place themselves as the employer 'of choice' within the sector to attract skilled employees in a very competitive labour market.

The concept of organisational careers cannot be understood without reference to the ways in which organisations evolve and change over time requiring employees to adapt. Evetts (1996: 103) argues that employees can be both active and passive agents within the change process creating, as well as responding to, opportunities. Dainty et al (1999) incorporated this dimension of organisational change into their study of women's careers within large construction companies, and found that men and women responded differently to organisational change. Women perceived the change to be an opportunity for cultural organisational improvement and possible career enhancement whilst men perceived this change as a threat to their careers and also to the status quo which had underpinned their success. This study also revealed that the wider business climate affects the internal dynamics within organisations so that the early part of the 1990s saw the restructuring of many large construction companies in response to recession. As a result there was much uncertainty about job security which encouraged a competitive subculture in relation to the limited promotional opportunities available at the time. It is important to emphasise that Dainty's study covers the period of the early 1990s which was characterised by very difficult trading conditions within construction due mainly to the contraction in the house-building market. The business growth in construction over the past three years, though, offers a radically altered position with more professional posts available than there are suitably qualified people to fill them. Thus the focus on internal competition for posts has been replaced by an increased competition between companies for a greater share of the expanding market.

It is clear that 'organisational' careers, where persons move through a succession of jobs towards higher levels of responsibility and reward in a clearly defined hierarchical structure within a single company, are now less common. The changing business environment of construction means that graduates expect to change jobs and sectors (and even specialisms) several times in their careers. Kanter draws a parallel from her research into corporate power in the USA by making the point that *"challenging jobs on significant projects are more important, in the calculus, than promises about the future or benefits programs contingent on long service"* (Kanter, 1993:326). With the skills shortage within UK construction looking set to continue well into the first decade of this century, the opportunity to change employers for more challenging and exciting work as well as for promotion seems to offer almost limitless possibilities. This is particularly the case in the private sector where projects are often more varied and salaries more competitive. This points to the concept of career routes where *"employees are the units rather than the organisation and a 'career' is the succession of posts and positions through which employees move during their working lives"* (Evetts, 1996:2). Bagilhole et al (1997b) confirm that a 'zigzag' pathway for career development has now become more the norm within the building professions and is positively encouraged by employers. This route entails moving between organisations as much as possible to gain a broad experience, taking promotions where offered (possibly in smaller firms) and then moving on to a larger employer to take advantage of corporate benefits and higher status positions.

The need to change jobs to secure either promotion or more challenging work may, however, be a less effective career strategy for women whose careers are developed against a background of contradictory work and family roles (Dainty et al, 2000). This is particularly the case if they foresee a career break or need to move to another geographic location for advancement and have a partner who (as statistics indicate is likely) is more highly paid and therefore unwilling to relinquish his job. In Bagilhole's (1997b) study, for instance, although some women had followed this 'moving' policy to further their career, many others commented that the upheaval of shifting location, with all its implications for family responsibilities, made this option impossible. A letter which appeared in the *New Civil Engineer* written by an 'absent' woman engineer clearly illustrates the problem:

" I suggest that there are other reasons for not joining the civil engineering industry which are particularly relevant to women: low pay, long hours, low status and the requirement to be completely peripatetic. I have the misfortune to be working in Peterborough at present, due to there being no work available in my field nearer to my home in Devon. This involves a round trip of 800km every week, which is environmentally unfriendly as well as extremely tiring. Then when I get home for the weekend I have to prepare a week's food for my husband and children, do a whole week's worth of washing and ironing and turn a deaf ear to the complaints regarding the things that do not get done because I am not there" (NCE, 3 December 1998:19).

For some highly specialised sectors of civil engineering opportunities still remain to pursue 'organisational ' careers within single companies with internal mobility being the main route to promotion. In these circumstances, it is still usually the case that senior positions involve management of both people and function. However, as discussed earlier, such progression often necessitates moving from doing the actual engineering or science to managing others who are doing it. This career route out of engineering into management can pose problems of professional identity for engineers, but it is also clearly a problem for women engineers because so few of them either choose to move into senior management positions or are overlooked for promotion. The increasing emphasis on the 'management' component of civil engineering roles is discussed later in this chapter, but the place of management within the industry is a function both of sectors of work and organisational settings and this is now discussed with a particular focus on the part played by the Institution of Civil Engineers.

5. How the UK civil engineering profession is organised

Much of the material that follows comes from ICE publications and industry journals, particularly the NCE and backs up my personal knowledge and experience of the profession.

Historically, civil engineering in the UK has operated through companies established under partnership or associate arrangements, with family-owned firms being a common feature of the profession, particularly in the early part of the last century. All those companies providing civil engineering design expertise are known as civil engineering consultants. These consultants design and plan projects and schemes in the sectors outlined above. Obviously not all of the consultants can offer expertise in every sector so that some firms have developed a strong track record in the water sector whilst others may have more experience in road and bridge building. Thus companies gain a reputation for specialist services in certain segments of the business. One area that has

seen a lot of growth in recent years is environmental engineering and there is some evidence from this research to show that women may be particularly attracted to this type of work.

In the late nineteenth and early twentieth centuries only a small number of consulting firms existed and these flourished in a climate of great industrial and public sector expansion. Although not highly rewarded in financial terms the profession was established as highly respectable and had an air of traditional authority about it. Women as professional engineers had no place in this male environment and were effectively excluded from entering because of the prevailing assumption that this was not an appropriate role for them. The profession's aura of being almost like an exclusive male club continues to the present day when the senior partners, associates and directors of the main consulting firms are, with very few exceptions, still all men.

Traditionally consultants work with statutory agencies or local/regional authorities who commission the work (much of the business is in the public works sector such as the design of roads, sewer networks, bridges and ports/marinas), contractors who build the project and a whole range of other intermediaries who have an interest in the job. In the global marketplace jobs have to be bid for through overseas government and local regulatory structures as well as through international aid agencies and development banks. For many consultants an increasing part of their work is now to be found overseas; this has led to some significant changes in recruitment patterns and also to different styles of working.

The Institution of Civil Engineers (ICE), the industry's principal professional body, is constituted under Royal Charter and, founded in 1818, it is one of the oldest of the professional engineering bodies in the UK and today has the largest membership with numbers approaching 80,000. It has very grand offices located at Westminster close to the heart of government and sees itself as having three main functions, that of a learned society, as a qualifying body and as a voice for the civil engineering profession (Druker & White, 1996:129). Through the operation of a broad committee structure it seeks to influence government policy on all matters connected with the profession. Through its education and public events programme it has been instrumental in raising the profile of

the profession in the public domain and even in times of economic recession has maintained high levels of membership.¹

There are three levels to which a British engineer in any specialism can aspire: craftsman/craftswoman engineer, incorporated technician engineer and professional or chartered engineer. The Engineering Council (UK) is the co-ordinating body which regulates the standards of education and experience appropriate for admission to each level across all the engineering institutions; for civil engineering it is the ICE which implements the procedures for professional status attainment. Because becoming chartered now is almost akin to a licence to practice there is increasing pressure on both employers and young recruits to participate in this process. In addition clients want to know more about the qualifications of staff assigned to their job (Druker & White, 1996:117) and the greater wealth of professional qualifications and experience of staff can give companies the market edge. The participation by employers in professional development programmes (particularly those that lead to the chartering of graduates) seems now to be an essential human resource investment. However, recognition that the whole process is prescriptive, costly, lengthy and bureaucratic has made some companies more circumspect about whom from their staff they nominate for this pathway. As part of an earlier study I looked at the chartering experience from the employees' perspective (Watts, 1995) and found that this process is often problematic for the candidates and has built into it a degree of gender bias. The significance of the chartering process as part of the day-to-day working experience of the women interviewed for this study is of special interest, particularly as the ICE has pledged to enforce more rigorously its ongoing training requirements for engineers.

The way that civil engineers are to be professionally recognised or accredited in the UK in future will be changing following agreement by the ICE Council in September 2000 to approve recommendations to move to a dual membership status. This ensures that in future civil engineers satisfying the requirements of the ICE's incorporated professional review or its chartered professional review can become full Members of the Institution. Incorporated engineers will register as IEng MICE at the Engineering Council, chartered as CEng MICE; this applies to those qualifying after January 2001. This change is intended to facilitate the achievement of professional accreditation by engineers who enter the profession without a civil engineering degree, but who possess

¹ (Unpublished figures from ICE membership department, 23 January 2002).

other relevant qualifications and training, and wish to apply for membership and chartered status with the ICE. This change has occurred in response to the increasing concern about the continuing decline in numbers of civil engineering graduates. It is worth recording here that this decision has been keenly contested within the profession with those wanting to retain and 'protect' the former single chartered status being charged with elitism (NCE, 11 January 2001:5).

There is no doubt that the ICE has an influential role within the profession not least because its activities and initiatives (developed under the auspices of its technical boards or committees) are widely supported by its members representing all strands of the business - by contractors, consultants, academics, local authorities, research and development companies, port authorities, power generators, and government agencies/departments. Regular discussion meetings are convened for members across the regions to consider topical issues and to share knowledge and information about technical matters and broader industry developments. Competitions are arranged to acknowledge and reward good engineering practice with the aim of raising the profile of the profession. In addition a variety of social functions taking place in London and the regions appear on the annual ICE events calendar. (Whilst senior figures in the profession continue to commit their personal energies and corporate support for the work of the Institution, its role in maintaining professional standards of competence will continue).

6. Work practices

The two core activities that make up civil engineering can be characterised as 'designing' and 'building'. It is the consultants that traditionally carry out the design function and the contractors who do the building of structures. These two functions each comprise a different set of working styles and conditions and can be seen as separate but connected subcultures within the construction process. However, in recent years there has been some blurring of these 'boundaries' as companies have sought to establish a stronger interdisciplinary skills base. Thus, some contractors, such as Tarmac, now have a consulting division. Despite a partial convergence, the profession retains this conceptual split and the images conveyed by each of these functions in terms of the working pattern and environment for engineers is quite different.

Construction sites are dirty, cold and noisy places, and working conditions are often made worse by bad weather. As Greed (1999: 14) points out it is often the building site

that is used as the excuse as to why women should not go into construction. Despite the presence in small numbers of tradeswomen and female engineers, the culture and the workforce composition of the traditionally male construction site have remained fairly intact. Women on construction sites still seem to be in a pioneering phase. In contrast, the office environment is usually warm and clean and there is certainly a greater female presence, taking into account the administrative and support staff, nearly all of whom are women. Whilst the differences in the physical surroundings of office and site seem obvious, what is less clear is the degree to which the culture of site and office differs. The exclusive and abrasive nature of construction sites is now well documented (Eisenberg, 1998) but the assumption that women may feel more comfortable working as engineers behind a desk in an office may not be correct and one of the questions addressed by this research is whether office based working provides a more welcoming environment for female engineers.

The amount of time that civil engineers spend on site and in the office is very variable. For some, their work is almost entirely office-based, whilst for others there might be a period of several years of continuous site work, particularly on long term projects such as, for example, the Cardiff Bay Barrage or the Jubilee Line Extension. However, the chartering process requires engineers to have had some experience of site work, for instance as a resident or assistant resident engineer on a project. This means that some period of site working will form part of the career experience of most engineers who will have to interact closely with a wide range of construction workers.

On construction sites, the behaviour of those in authority (the foreman or general foreman representing the contractor) sets a tone and an example for the crew to follow, and strongly affects the working atmosphere. Codes of conduct in relation to bad language, the display of pornographic material in site offices and the way that disputes over quality of work are handled are usually the foreman's responsibility. The industry is noted for its conflictual working especially in respect of the relationship between consultants and contractors, each being ready to blame the other for a whole range of problems that inevitably arise on jobs. The foreman is often heavily involved in the conflict resolution process and at the same time has to retain the co-operation of the labouring team. This is notoriously difficult. Health and safety practices, especially in relation to the use of tools and equipment have been drawn into sharper focus by the industry, and it would usually fall to the foreman to brief the site engineers about these

issues. For those new to a site, there is much to become familiar with and given the gender imbalance on sites, it may be more difficult for women to ask questions since this could make them appear vulnerable. Any new worker wants to make the workplace more comfortable for themselves by establishing congenial relationships with co-workers. For women engineers on site, though, striking the right balance between friendliness and compromising their authority is particularly difficult.

There is no doubt that whilst women are very visible on site (whether they are there in an engineering role or in a trades role) their presence as professionals within the office-based setting may be less acknowledged and render them much less visible. Women may thus find themselves in a contradictory position depending on which setting they may be working. The extent to which having to adjust to these different work environments and establishing their professional identity within each is seen by them as a challenge or an opportunity is discussed in Chapter Six.

7. Management

The term 'manager' within civil engineering and the wider construction sector is used to denote a broad range of roles and levels of responsibility. Management may mean the management of others, as in respect of line-management responsibility or it may mean the supervision of a team as part of a project, or it may be a descriptive term for a hierarchical position denoting a level of responsibility rather than a direct supervisory role (Asburner, 1994:190). On construction sites, for example, a range of occupational titles is used to denote some form of management/supervisory responsibility; these include charge-hand, ganger and site foreman (Druker & White, 1996:125). Druker and White make the point that these 'supervisors' are generally drawn from the ranks and receive no special training for their enhanced role. Within civil engineering we see a similar variety of organisational job titles denoting some element of management responsibility; 'section leader', 'team co-ordinator', 'section manager', 'project manager', 'associate director', 'partner', 'director' are all terms frequently used in the industry. Often these more 'office-based' roles also carry no special training in relation to the management element of the role as those taking up these positions are expected to 'grow into' them. Trying to draw parallels across companies concerning the degree of authority invested in these roles is almost impossible and certainly presented some challenges in trying to understand exactly the nature of the roles held by participants within the study.

Site management is especially hierarchical with every worker knowing his or her place within the culture. This results in a clear vertical segregation of the workforce that maintains professional and social boundaries. Construction is strongly classed as well as gendered. Those in management positions get things done by using a 'command and control' model. Instructions are issued with the expectation that they will be carried out with very little discussion or deliberation. Greed has characterised this as the "*John Wayne approach to site management*" (Greed, 1999:14).

The nature of civil engineering is that it is a project-dominated industry. Projects come and go; they start and they stop, often with very little warning. They are subject to constant change and, most troublesome of all, they are all different. This means that there is an ever present learning curve for all involved and as a result management work in civil engineering is by its nature untidy and disjointed. To add to this, the changes in the UK industry over the past ten years have produced a more globalised way of working and the demands on senior managers have become more sophisticated with the cultural requirement of total commitment to the job being seen as yet more essential. The ways in which this cultural requirement impacts on women is an important part of this investigation, specifically whether this is a strategy to restrict their progress.

My search for information about where women are positioned within the industry was not straightforward. The top twenty consultants all publish annual reports that include the standard categories of performance and structure. The individual composition of their boards is listed, but in most cases, it was not possible to ascertain the gender breakdown of these boards. Direct enquiries to three companies to solicit further details were met with uncooperative responses, broadly on the lines that had this information been regarded as important it would already be in the public domain. Despite the resistance to that line of questioning, I did check whether any of the companies had a female chief executive, with the predictable finding that no woman has yet risen to this position in the UK.

The role of the ICE in speaking on behalf of the profession to policy makers is significant, although its effectiveness was questioned by several of the participants. Some, though, specifically identified a stronger leadership role for the Institution in promoting the role and status of the profession within society. It is therefore useful to consider the way that the ICE organises its own internal governance and management structure.

The Institution is governed by a council that considers the recommendations of its committees and panels in relation to all areas of operation including policy, professional accreditation and personnel. The Council as the regulating and decision making body of the Institution is made up of forty-two members elected by the overall membership. The Council is headed by a President and up to eight Vice-Presidents, three of whom are 'succeeding', which means that in turn they are guaranteed to become President. In the spring of 2001, five of the forty-two council members were women; there were seven vice-presidents, two of whom were women. Neither of the two female Vice-Presidents was in 'succeeding' positions, a fact that did not go unnoticed by several of the women in the study. This means that a female president of the ICE remains unlikely for the time being. The implication seems to be that if, as a woman, you can get yourself nominated on to the election list for council, the 'difference' factor will ensure you get elected but moving into any greater position of influence has been shown to be much more difficult. In this respect, the presence of women in senior governance roles within the Institution smacks of tokenism ensuring that it remains a bastion of male authority.

8. Perspectives on change within construction and civil engineering

There is widespread agreement that civil engineering in the UK has undergone significant change in the last ten to twenty years which has affected all aspects of the business including recruitment patterns, training, organisational style, strategic research and type and location of projects. One of the principal factors bringing this change has been the change of the client base. Huge public sector infrastructure projects such as the Jubilee Line extension are in decline; these have been replaced by private finance initiative projects and commercially funded projects, including even those as large and complicated as the channel tunnel. Another factor has been the recession of the 1980s and the early 1990s from which some consultants have never recovered. For some consultants a sizeable proportion of their work was connected to house-building projects. For them, the collapse in the UK housing market had a considerable impact on their long-term business pattern, forcing them to diversify into other disciplines such as transport, water and geotechnical engineering sectors. With the increasing environmental lobby, some companies have invested in 'growing' a specialist environmental expertise, particularly in the areas of managing all types of noise, water

and air pollution. Several interviewees commented that women seemed to be particularly attracted to this area of work.

The business cycle for consultants became more uncertain in the late 1980s and early 1990s due mainly to the decline in work levels in the UK. This caused a downturn in recruitment patterns and overall staffing levels fell. However, these are steadily improving from the very low levels seen in the early 1990's to a rapid growth situation in 2001 (NCE, Consultants File, 2001). In January 1999 it was reported in the NCE that according to forecasts from business analysts, Hewes & Associates, civil engineering in the UK was heading for three consecutive years of decline. A 6.2 per cent fall in output in 1998 would be followed by a predicted further decline in 1999 of 6.3 per cent. Their predictions also showed that during 2000-2001 the market would further fall by another 1.9 per cent. Projections also indicated that the new build market would peak in 1999 and then experience a contraction of 10.4 per cent during the first two years of the millennium (NCE, 28 January 1999). These predictions have not proved to be wholly accurate. Whilst figures for the new build market for 2000/2001 are not available, there are clear signs of a significant upturn in business overall. Indeed the 2001 Consultants File reports, for instance, that of the top twenty consultants (as defined by staff numbers) only Halcrows saw both their staffing and earnings fall in the previous year. All of the top twenty consultants reported increased confidence in activity levels with further rises anticipated in the proportion of work undertaken overseas.

Increased competition in both the national and international marketplace has forced some of the old established UK consulting firms to merge with each other to provide a more comprehensive skills base more like a 'one stop shop'. For example the consultants Sir William Halcrow and Partners, despite having a fairly multidisciplinary skills base, considered that its expertise in the building sector was too light to enable it to grow market share in that area. Thus in 1997 Halcrows entered into merger negotiations with the Scottish consultants, Crouch Hogg Waterman who have a strong track record in the building sector both north and south of the border. The newly merged company is now in a position to offer a full range of capabilities on large scale building projects (NCE, Consultants File, 1998).

Others have sought alliances with overseas companies. In both types of mergers there is inevitably some staff 'fall-out' at senior management and lower practitioner level. One such merger, announced in December 1998, was the planned amalgamation of W S

Atkins (which in 1998 was again ranked as the largest of the UK consultants in terms of staff numbers and second only to Brown and Root for fees rendered) with the construction company Bovis (NCE, Consultants File, 1999:50-52).² W S Atkins is a high margin facilities management and consulting company whilst Bovis operates a low margin construction based business. This merger, like other similar mergers, is based on the perception that clients increasingly demand integrated solutions. This is especially true on Private Finance Initiative (PFI) contracts where private concession companies are expected to design, build, finance and operate infrastructure. PFI is spreading across the world, and at the same time, large private sector clients are increasingly looking for construction firms who can deliver and manage new facilities. The planned merger of Atkins and Bovis did not in fact come to fruition mainly because city analysts did not have confidence in the predicted share price; it was felt that the price Atkins had agreed for the take-over of Bovis was too high. Despite this failure, the NCE reported in January 1999 that Atkins had established the principle of diversification and expansion through acquisition and would therefore be considering other alternatives in the future (NCE, 28 January 1999). The Bovis/Atkins group would have created a company able to compete on the world stage with groups like US giant Bechtel. With the loss of the traditional partnership or associate-based practice, it will increasingly be corporate culture that will determine how civil engineering is undertaken in the UK.

The industry survey results carried in the 2001 Consultants File indicate that this trend is continuing with almost 10,000 engineers in the UK working for companies which had been sold either to another owner or to their own management in the previous year. Others have seen their employers make the switch from partnership to limited company. The factors driving these changes seem to be the need to grow coupled with the need to preserve independence. In addition to the real practical issue of merging two different companies, there is the challenge of welding together the different cultures of two large organisations. Some engineers I know who have been through this process explain that adapting to the culture change from a merger or take-over is not always easy, because organisational values can vary so much and reconciling the agendas of competing interests has to be managed very skilfully so that 'conflict' is kept to a minimum.

² Brown and Root have overall technical and strategic management of the largest civil engineering project the world has ever seen-the Man Made River Project in Libya-and this has had a very positive effect on their balance sheet. Public lecture given at Wallingford, Oxfordshire on 14 October 1998 to the Thames Valley branch of the ICE by two company directors of Brown and Root.

Not all consulting firms favour, at least in principle, such fixed merged organisational change. One of the largest consultants, Mott Macdonald, has consistently stated its preference for looser, more independent arrangements, allowing the firm to bid for work on an ad hoc partnership basis with other specialists taking advantage of opportunities in a more flexible way (NCE, 3 December 1998:15). Another of the top ten consultants, Gibb Ltd, had operated for many years in a similar way but difficult trading conditions and strong competition can force a change in business attitude, so that Gibb Ltd eventually did succumb to the attraction of joining with a larger enterprise and was acquired by the US Law Group in 1989. Having successfully managed to re-brand itself as LawGibb, the company was only to find early in 2001 that they were being sold off by their parent company because they no longer fitted in with the longer term plans of the group. The new buyer was named as another US giant, the California based Jacobs Engineering.

Looking at where UK consultants are working provides an interesting insight into changed work patterns. Twenty years ago only 20 per cent of their work was located overseas; now it is well over 50 per cent in most cases (NCE, Consultants File, 2001:4-5). On average, the proportion of overseas work undertaken by the leading British consultants appears in 2000 to have fallen very slightly. Given the improving market conditions in the UK and the problems in South East Asia this is not surprising. However, the continued reliance of UK consultants on overseas work remains critical with seven out of the fifteen largest firms having 50 per cent or more of their work outside the UK (NCE, Consultants File, 2001:4-5). UK civil engineering has thus become an international business with many companies directing certain types of work to different countries to take advantage of cost bases and staff availability. In research into the training and development of international staff Baumgarten (1995) identified four factors that influence who is assigned to overseas projects: leadership skills, initiative, emotional stability and personal drive or motivation. Other factors, though, can play a role in influencing the choice such as the foreign language skills of an engineer; also the location and expected duration of the project can be particularly important. Some jobs involve working in quite harsh physical conditions with an impaired local infrastructure as well as a hostile social environment. In this context, the culture of the host country in which the job is located could also inform staff assignments. For instance, many of the large-scale water supply and irrigation projects are situated in the Indian sub-continent

and Africa where the presence of women site engineers could pose real operational difficulties because of the social and cultural expectation that engineering expertise, as part of the public sphere, is practised by men. The business requirement, therefore, to recruit flexible, high quality engineers (who may also be *appropriate* for overseas assignments) could in practice be a gender issue. Currently the great majority of expatriates are men whose families 'go with them'. This arrangement is not always successful which demonstrates that the chance of working abroad has to be balanced against the demands of having a family. "*This may effectively preclude many women from taking up such a challenge*" (Druker & White, 1996:227). This can have an adverse affect on career development as some international projects carry great prestige and provide an opportunity for especially interesting and unusual work.

There is no doubt that as far as the domestic market is concerned, slow growth in government spending on infrastructure and defence, combined with tight commercial markets, will continue to force companies to restructure their expertise and business focus. The key challenge currently facing UK civil engineering is the growing skills shortage with longer term projections looking very serious. Most consultants now report a shortage of suitably qualified graduates which, with declining numbers pursuing civil engineering degrees and the closure of a number of UK university civil engineering departments, is unlikely to be rectified quickly. This serious shortage is leading to a rapid increase in salary levels payable to graduates. For 2000, consultants were reporting salary increases of up to 15% for graduates so that graduates with two to three years experience can now expect their salaries to top £20,000 (NCE, 5 April 2001). This strengthening market has also given rise to intense competition for both new recruits and established professionals. Hyder, for instance, has reported the mass defection of its Special Structures team that had established much credibility in the area of long span steel bridge design, to rivals Maunsells (NCE, 18 January 2001). The steel bridge sector has been identified as a potential boom market that will generate healthier margins than traditional new build work. The image that consultants carry in the business is still very important. Maunsells was apparently of the view that they could not capitalise on the opportunities of this profitable sector because it was seen by clients as a concrete or composite bridge specialist which undermined their chances of winning this alternative type of work. The subtleties of competitor profiles are now considered more closely

than ever before, because it is crucial for consultants to be able to demonstrate niche expertise for niche markets.

The improving business climate for UK consultants may, in the longer term, bring increased personal opportunities for those already in the profession as well as attracting essential new recruits; improved salaries are just one example. Looking further afield, the introduction of increasingly high environmental, health and safety standards worldwide and the developing infrastructure needs of emerging economies will continue to present substantial opportunities for the UK civil engineering sector. How the trading identity of the leading consultants will be affected by the increasing trend towards establishing larger cross-national companies is difficult to predict. However, the future of the smaller firms looks doomed, as they find it more and more difficult to sustain their position and compete with the integrated skills base of larger rivals.

Delivery of a technical solution to a client used to be the main challenge faced by civil engineering managers. Rigid processes, combined with a philosophical tradition of a definitive 'right and wrong way', meant that historically there was little scope for deviation. Recent changes to the business now demand a more flexible approach, and an extended skills set to match. In practice, the management of relationships, be it one-to-one, within or across teams or in a supply chain, has risen in importance. The rise of 'partnering', for example, has placed a greater emphasis on the skills needed to work effectively with people. Managers, now, are increasingly appointed to projects as much for their ability to motivate, network and influence, as for their engineering expertise though generally little training is provided to develop these non-technical 'social' and 'business' skills. The implication seems to be that these are somehow expected to be 'naturally' acquired.

Earlier in this chapter, I referred to the increasing computerisation of civil engineering and the crucial role that all forms of technology now play in delivering the solution. This represents an enormous shift in the culture and operation of the profession and for many older engineers this has been the most significant change of all. We now see the proliferation of 'virtual' teams on civil engineering projects. This has been made possible by advances in communications technology and has heightened rather than diminished the need for effective communication. Both managers and team members working remotely may need to have established a higher degree of trust and understanding than normal if the project and client service is not to suffer. Employers

state that getting the right person, therefore, is as important as having the right knowledge (NCE, 21 June 2001).

Thus far I have discussed the changing nature of civil engineering very much from the business perspective particularly looking at the effects of globalisation on trading patterns. However, concerns about the *way* that business is undertaken and the very nature of project-dominated work patterns (uncertain, tightly costed, narrow profit margins and contractual disputes) has given rise to initiatives aimed at understanding the culture of construction and presenting some recommendations for improvements.

9. Industry initiatives

The Latham Report (1994), commissioned as a joint government/industry review of procurement and contractual arrangements in the UK construction industry, was completed in 1994 (Latham, 1994). The Report documented how work practices have developed within the industry around a model of conflict between consultants and contractors in the delivery of projects. Particular issues, such as over-runs on contracts, liability claims, delivery and quality of materials and disputes about building methods, were addressed. The Report highlighted the financial and personal cost of adversarial working practices that dominate the industry. It pointed to a general culture of conflict and blame in which good personal working relationships with colleagues and clients are undervalued. Employers in the industry have acknowledged the need to develop the 'people' side of the business so that the various employment relationships in the industry (especially when taking into account the extent of 'sub-contract' workers) can be better managed. One way of developing 'people skills' was the recruitment of a more diverse workforce. In recognition of the need to widen the recruitment base in construction, one of the Report's recommendations was the establishment of an Equal Opportunities Task Force to develop a strategy to improve the representation of women in the industry.

The theme of the Latham Report has been developed by Bagilhole, Dainty and Neale (1997a) in their review of employment practices within construction, concentrating on the position of professional women. The undervaluing of individuals and resulting staff turnover is highlighted as a major problem for the industry. Their paper suggests that arguing for diversity within the construction workforce from a moral perspective has failed, and the only chance this initiative will have of success is by invoking the

business case. They argue that widening the recruitment base will bring higher calibre employees to companies and thus increase profit levels.

Another initiative stemming from the 1994 Latham Report which highlighted the need to improve equal opportunities in the construction industry and in particular to increase the involvement of women was the establishment of a special working party (Working Group 8) by the Construction Industry Board to investigate diversity issues within construction. The resulting report entitled 'Tomorrow's team: women and men in construction' (CIB, 1996) focused mainly on the business case as the principal driver for change, citing a long-term skills shortage as the main concern. Developing people in terms of skills, qualifications and experience was highlighted as a key way of maximising the contribution of those already in the industry and also as a way of demonstrating to prospective entrants that, whilst the industry often appears to be technologically led, its intrinsic worth lies in the quality of its employees. Emphasis was placed on the recruitment and retention of women at all levels covering both craft and professional occupations but much less comment was made about the chronic under-representation of ethnic minorities within construction. Although the report cites the Disabled Persons (Employment) Acts of 1944 and 1958 as part of its review of equal opportunities legislation it makes no mention of this group as part of the diversity framework. It appears, therefore, that the industry is likely to 'invest' more in some groups than others.

This industry-led investigation was followed by a government-led initiative (undertaken by the Construction Industry Task Force, chaired by Sir John Egan) to review working practices in construction addressing issues such as efficiency, client satisfaction, partnering, project implementation, improving conditions on site and more effective contracting procedures. The resulting report entitled 'Rethinking Construction', but often referred to as the 'Egan Report' (1998), did not build on the findings of Working Group 8 incorporating a focus on people issues. Instead it chose to concentrate on process, procedures and management practices. How these issues can be effectively discussed without at the same time considering the composition of the industry's workforce is difficult to understand. Given that the industry has been characterised by widespread conflict on contractual issues with an increasing number of disputes ending up in court and many jobs operating at only a very minimal profit margin, the question has to be asked, are there better ways of doing business? Would

a greater contribution from women, for example, help to minimise conflictual ways of working or does the very nature of construction neutralise gender identity? Whatever the answers to these questions, these kinds of issues were not considered within the Egan Report. The result was a failure to get to grips with a revisionist approach to cultural change which included some attention to the nature of the workforce composition that continues to predominantly comprise white middle or working class men. One participant in this study (Susan Hamilton) commented that Egan had just “skirted round the issue”.

More recently the Engineering and Physical Sciences Research Council (EPSRC) has been considering the role of women in research within science, engineering and technology (SET), all of which underpin construction. Figures for academic departments continue to show that men far outnumber women and the situation in engineering shows the greatest disparity with just 8 women professors out of a total of 790 for the academic year 1999/2000 (EPSRC, 2002). The focus of the EPSRC enquiry has been on both the academic and industrial sectors and comments from men and women involved in research feature in a collection of articles that discuss issues of discrimination, family commitments, support networks, mentoring and flexible work practices (EPSRC, 2002). One question raised by the enquiry is whether positive discrimination is the answer to encouraging more women into the sector. The overwhelming view of those canvassed was that this would undermine the position of women in the workplace and could lead to ‘bad science’. Several contributors felt that the problems in attracting more women into SET begin in schools which, they felt, do little to break down stereotypes that suggest that “boys work on cars, while girls do something else” (EPSRC, 2002:3). The issue of career advancement for women is considered as part of the EPSRC enquiry in relation to a number of support projects including some formal mentoring programmes. These reveal that women benefit from having a female mentor because these tended to act as role models and the mentoring relationship is underpinned by a sharing of common experiences including planning for career-breaks and part-time working.

In summary, one of the major changes in construction is the industry awareness that meeting performance indicators is as much about understanding culture as commerce. In a highly competitive business climate, the need to balance a range of styles and attributes (all contributing to a positive balance sheet) may create more opportunities for

women. The need to co-operate and problem solve are becoming recognised as core skills. If we accept gender stereotyping with women generally being regarded as stronger at these 'softer' skills we might then expect to see an improvement in their recruitment and retention within the industry. However, set against this is the reality of modern construction projects; they are transitory and often set in distant locations (increasingly overseas) and are costed at very tight prices requiring the shortest possible construction period. As a consequence sites work long hours and the application of good employment practices becomes difficult to implement which may make construction in general and civil engineering, in particular, unattractive to women and to some men too as evidenced by the annual decrease in the overall numbers of men and women taking civil engineering degrees. It is thus not difficult to see how family life for both men and women working in construction can become lost from view in the face of sustained pressure to complete jobs on time and within budget (Bagilhole et al, 1997a).

This discussion of barriers to women entering the construction professions and remaining within them have so far centred on social and cultural factors but one issue that is highly relevant is that of pay, especially equal pay. Findings reported in the NCE (NCE, 6 June 2002) show that women are still paid less than their male counterparts in professional civil engineering roles. The 'gap' is particularly pronounced amongst mid-career engineers who have project-management responsibility with evidence that women on average earn 35% less than male colleagues and have seen their pay rise in real terms by less than 3% in the period 1999 to 2002. It seems that women would be justified in feeling that they are getting a raw deal. This is set against a background of steadily rising salaries across the profession with annual increases that far outstrip inflation. Predictably (due to the worsening skills shortage) the greatest increases have been seen amongst young recruits to the industry whose starting salaries have risen on average by 42% representing a 33% rise in real terms in the same three-year period.

A rapidly changing industry environment places demands both on organisations and the employees within them. As a consequence maintaining traditional structures may prove difficult to sustain especially if other companies (often competitors) adopt more progressive ways of working, taking advantage of technological innovation and combining expertise to ensure growth. This chapter, therefore, closes with three organisational case studies illustrating different pathways of change in response to the demands of globalisation and the challenges posed by the perceived benefits of offering

an integrated multi-disciplinary skills base. Possibilities for improving the gender balance amongst the technical staff within re-formed and modernised organisations, particularly in light of a continuing recruitment crisis, is considered within the context of the three chosen organisations.

10. Company Case Studies

Big private partnerships of consulting engineers have almost disappeared though they used to dominate the profession. Their financial accounts and executive pay arrangements were never disclosed. Today sees different company operating structures which broadly fall into three types: private companies often involving trusts; some companies listed on the stock exchange; and private limited companies owned by a few directors or US conglomerates (NCE, 13 May 1999). In response to the challenge of a globalised marketplace most consulting firms have had to adapt their skills and business focus within these types of operational structures and it is possible to identify three distinct types of change models. Some companies have proactively sought change, others have had to change (and in that sense) have had change forced upon them and, lastly, others have (by and large) resisted radical organisational re-structuring. Although very few of the take-overs of civil engineering consultants could be described as 'hostile' it is clear that some companies have welcomed take-overs more than others as a way of maintaining or increasing market share. Underpinning this is the acknowledgement that there are advantages to being bigger, particularly the financial muscle it brings to enter PFI schemes and the opportunity to access a particular market sector or geographic region.

The three case studies that follow are intended to demonstrate that civil engineering consultants are driven by the need to grow and also by the desire to achieve excellence and innovation in their practice. Each of the company case studies corresponds to one of the organisational responses to change identified above and are relevant because many of the participants are employed by companies that have developed their business by broadly following one of these 'change routes'. No two companies are the same and there now exists a plurality of organisational types in addition to the three main ones discussed above. These range from partnerships to Plcs to those limited by guarantee where profits cannot be distributed but are ploughed back into the company. Within these different organisational arrangements the issues of diversity and equal opportunities have started to be taken more seriously and gender has been 'factored in',

often as part of the discussion about the lack of suitably qualified staff for the increasing number of vacancies. As far as the three case studies are concerned the impact on women of merged or reformed companies is not yet clear so the critiques of change are necessarily limited to a general structural perspective.

(i) The WSP Group

WSP is young as far as UK consultancies go, having been established for only twenty-nine years and is an example of a consultant that has sought rapid change in both its size and structure. With its head office in central London it now has twenty-six regional offices and is the fastest growing of all UK consultants. It was originally privately owned but went 'public' in 1987 with the stated objective of diversifying its expertise and expanding its share of the UK market by means of merger and acquisition that was to be funded by the equity from its public flotation. WSP is thus an example of a consultant that has placed the acquisition of other enterprises at the heart of its growth strategy. Whilst none of the participants in this research were employed by WSP, three were working for a consultant that had consolidated its growth in a similar way.

From its original focus as a building services consultancy WSP has diversified its activities into environmental engineering, transport planning, facilities management and IT. It has also developed its overseas work profile principally by acquisition of local companies and views its success in Africa and South East Asia as essentially locally grown. The group derives 40% of its income from the UK and 60% from overseas and sees its continued growth rooted in its identity as a global construction consultancy. In 2001 it had 3002 employees with 372 civil or structural engineers; women comprised 8% of the professional staff. (NCE, Consultants File, 2001). This puts the group way behind such companies as Binnie Black & Veatch where women make up 20 % of the civil and structural staff. The Group has adopted an equal opportunities policy (personal communication) but nowhere is this mentioned either on the group web site or in its newsletter. Some enquiries to the company revealed that implementation of this policy is currently being discussed and that no formal measures are in place to monitor diversity or promote higher recruitment of under-represented groups. The Groups' rapid expansion has very much been business and market led and contrasts with Oscar Faber, for example, who have concentrated on the development of its staff to consolidate its market position.

(ii) Montgomery Watson

Montgomery Watson started trading as Watson Hawkesley in a small partnership based practice specialising in water and wastewater markets. Even with steady growth it was difficult for the company, as a partnership-based enterprise, to build a strong capital base to enable it to make acquisitions or to take significant risks in following different business opportunities. This illustrates that partnerships can be a good way of running a business as a personal business but they can constitute a barrier to change, particularly significant growth.

In its 150 year history Montgomery Watson has been the object of acquisition by US based conglomerates, and most recently by the Chicago based Harza Engineering Company. The merged organisation of MWH has strengthened its portfolio to provide services to a much broader sector including transportation, facilities development, energy solutions, general construction and infrastructure protection. This diversification has significantly altered the trading identity of Montgomery Watson that found concentrating too heavily on the wastewater sector was limiting its fee earning potential. Montgomery Watson's response to the changing marketplace has therefore been very much one of making its existing specialist niche expertise attractive to larger, more general engineering organisations and as a result it has assumed a 'merged identity'. In respect of its latest merger with Harza there are signs that its new corporate structure may lead to an increase in diversity within its workforce as well as in relation to the type of work undertaken.

The new merged company profile places a high priority on diversity and identifies strategies that are being implemented to promote a greater representation of women and ethnic minorities. These initiatives include the formation of a diversity council to act as an advisory and monitoring body to senior management on the effectiveness of diversity measures. This council also serves another function as a confidential "sounding board" for employees to voice their experiences of the workplace. The new company has integrated education about diversity issues into its training programmes for new and existing staff to demonstrate its commitment to individual success based on merit irrespective of race or gender. Greater cultural awareness is also seen as necessary to support the work of international offices that have a mix of 'local' workers as well as staff seconded from head office. It is too soon to gauge what difference this will make to the UK arm of the new company but these measures represent a distinct cultural shift

from the earlier inward-looking approach to staff recruitment and development. Despite this change in emphasis, it is interesting to note that the web site for the merged organisation makes no reference to equal opportunities. The extent to which the diversity measures are also intended to expose discriminatory practices is not clear but they do represent recognition of the need to have a diverse workforce in an international company and thus may be a cause for optimism. Three of the women taking part in the study are employed by Montgomery Watson but their contributions were made quite some time before this merger took place.

(iii) Oscar Faber

In contrast to the mergers and acquisition approach to expansion, Oscar Faber has chosen a path principally of organic growth to develop its business and in 2001 it was rated as one of the fifty best UK companies to work for (NCE, Consultants File, 2001). This is in stark contrast to the position in 1995 when the company was losing money and looked doomed. New approaches to management of the business (which can best be described as creating a stakeholder environment for employees) enabled it to survive and later grow without redundancies or salary-cuts. Recognition that continuing professional development of its staff was of key importance both to individuals and to the business formed part of this more inclusive environment. Thus support for those going through the chartering process has been generous culminating in a £1000 bonus in salary when this is completed.

This 'amoebic' approach to change has enabled the company to retain its core identity without radical restructuring. In the two-year period from 1999 to 2001 the company grew by 50 % with women comprising 19% of all staff. Looking at the range of measures it has introduced to retain and develop staff, as part of this large increase in staff numbers, there are some key factors that differentiate it from other UK consultants. For example all staff are invited to participate in an ongoing critique of company performance to define its cultural values. One consequence of this has been the donation to charity of 1% of the company's annual profits which, in 2001, stood at £4M. All employees are offered share ownership and the objective is to give the staff an overall 25% holding. Another example has been the establishment of generous maternity provision and also the offer of paternity leave which certainly makes it unusual in the sector. The company pays the child care costs on behalf of employees which is seen as one way of acknowledging that for many of its staff there are 'costs' attached to

working and also that being a parent should not be a handicap in the workplace. Despite these employee-friendly policies (including paying higher than average industry salaries) staff turnover is just below 20% which, although lower than the average for the sector as a whole, still seems surprisingly high.

The company has chosen to concentrate on five business streams consolidating its expertise in these areas initially rather than diversifying too broadly. This policy seems to be generated by the belief that there will be plenty of work in these business areas for many years to come so obviating the need for ventures into completely new technical fields. This does not rule out the possibility for the future of exporting this specialist expertise to underpin major growth in overseas markets. Oscar Faber's approach to the challenge of globalisation is, therefore, quite different from many of its competitors and reflects the organisational model of career development discussed earlier. Four participants were working for this type of consultant that had chosen to reject diversification as a route to growth and concentrate instead on becoming more specialist by investing in training its staff to enhance its niche position. The range of benefits offered by Oscar Faber to its staff, however, was not replicated in this latter case and Oscar Faber would seem to be almost unique within the profession in terms of the nature and extent of its 'stakeholder approach' to underpinning organisational development.

11. Conclusion

As this chapter demonstrates, the civil engineering profession is inextricably linked to the fortunes of the construction industry which over the past decade has moved from a situation of decline to one of rapid growth. Employment opportunities within the profession have fluctuated accordingly and currently are plentiful. However, this does not necessarily mean that opportunities for progression for men and women are equally distributed and figures shown earlier (Table 2) suggest that a gendered internal labour market operates within the profession that enables men to achieve higher professional and managerial status with women marginalised at all levels. Even if the over supply of jobs and greatly enhanced rates of pay (particularly for graduate entrants) succeed in attracting more women into the profession there is no indication that they will achieve rates of progress on a par with male entrants. The model of progress that is assumed to be merit-based but in reality includes a whole range of 'other' attributes associated with reputation-building, sponsorship and networking may continue to deny women full

membership of the 'club'. A key question, then, is whether in a climate of prosperity within construction women can 'break into' these career enhancing activities that make up the subculture of the profession. The issue of subcultures constitutes the first of three main themes of the research. The impact of subcultures on the progress of women within the profession is closely connected to the second theme, work/life balance which may be the most powerful influence on choice of career path for women. The ways that work practices and attitudes within the profession can be changed and modernised comprise the third theme.

The issue of change within the profession has formed the main theme of the chapter with the dramatic improvement of the business outlook for most consulting firms underpinning significant expansion programmes. A review of the profession has identified particular areas of change associated with new working practices (computerisation is one example); others include a move towards larger companies and corporate organisational structures, an increased emphasis on overseas projects (as part of globalisation), new criteria for membership of the ICE and the growing presence within the industry of the non-technical business manager. The impact of these changes on women in relation to which areas of specialism to pursue, which companies to join and whether management should form part of their career path lies at the heart of this enquiry.

Globalisation has been shown to be driving a large part of the UK civil engineering business and with this comes the assumption that engineers may need to be available to travel or work overseas at short notice. This flexibility is not just limited to the international context as there is now a tendency for UK consultants to establish regional bases as a way of capitalising on 'local' business opportunities (the WSP Group is one example). This raises the issue of staff relocation particularly at a time of widespread staff shortages within the industry. Both scenarios may not be popular with women (or with some men) as they attempt to balance their career and family expectations. Fatherhood, though, does not contradict these expectations in the way that motherhood does.

With management now seen as a signifier of success within the profession and still a highly male-dominated activity, women are having to choose whether to compete for promotion on these 'masculine' terms. This gives rise to the equality/difference debate (see Chapter Three) on a general level but in particular for engineering it raises concerns

about becoming separated from technical problem solving and concentrating on managing people, projects and budgets instead. This is mirrored in other professions where we see women moving away from practitioner positions opting for more highly paid and higher status management roles (Crompton & Sanderson, 1990).

Although some of the issues discussed in this chapter are specific to civil engineering, others have close parallels in other male-dominated areas of work, particularly within the professions which are characterised as expert sites of competence and practice. The combination of high level qualifications with a licence to practice maintains the ideology of professionalism. This is discussed in the next chapter as part of the theoretical framework of the research which takes as its starting point the development of patriarchal relations within employment that are underpinned by gender relations in both the public and private spheres.

CHAPTER THREE

WOMEN IN THE LABOUR MARKET

1. Introduction

This chapter discusses the theoretical framework of the research and reviews literature on the gendered relations of employment. A number of explanations have been offered for women's subordinate position within the labour market but I have chosen to concentrate on a feminist theoretical perspective that argues that the social relations of work and its sexual divisions are structured around gendered power relations. The chapter opens with some reflections on the changing social meaning of work within an historical perspective and examines how public definitions or understandings of work impact on private roles in the domestic sphere. This brings together the notion of 'public' and 'private' spheres that underpin the concept of the gendered division of labour. This historical perspective on work as both domestic production and commodity production (Rowbotham, 1983) is intended to provide a context within which to discuss the complex nature of work in contemporary western society.

The subsequent sections focus on five key issues, beginning with the social construction of work that is framed by public and private patriarchal structures in the workplace and the home; the ideas of Walby (1990), in particular, inform this section. The concept of subcultures within the workplace and as part of organisational life is the second major topic of the chapter and is discussed through a review of feminist writings and developed with reference to the particular problems women face in male-dominated occupations. This topic also constitutes the first key theme of the research. The concepts of the 'sexual contract' (Pateman, 1988) and 'masculine identities' within organisations (Cockburn, 1991) that characterise these subcultures are considered in relation to patriarchal structures and the different types of 'value' accorded to men and women in the labour market. Sexual harassment, as a set of power relations, is one representation of the sexual contract and receives detailed attention. The last part of this section examines subcultures within professions and looks particularly at how the dominant male subculture within science and construction (the context for civil engineering) acts as a barrier to women's progress. The discussion is based mainly on the conceptual framework offered by Spencer and Podmore (1987) to identify the main factors contributing to the professional marginalisation of women. This framework has been

developed by Greed (1991) to highlight the complex layers of cultural constraints posed by dominant traditional images of professional identity. Linked to this is the issue of work/life balance which continues to focus discussion on the ways that work in its paid and institutional context may have to change in the future to accommodate caring responsibilities and leisure and family interests. This constitutes the second research theme and particularly examines how the concept of professional commitment (Williams, 2000) conflicts with the cultural expectation of motherhood (Hattery, 2001).

The fourth section of the chapter concentrates on how different authors have seen ways that change may occur within the construction professions in relation to an increased representation of women and also on whether qualitative improvements in their experience at work may be a function of 'critical mass'. The work of Greed (1991), Gale (1992), Court and Moralee (1995) and Bagilhole et al (1997b) informs discussion of this issue which makes up the third research theme. Finally the issue of management is considered with emphasis on how 'the manager' is socially constructed as part of the gendered relations of employment. The discussion of management as a specialised business activity poses the question of whether management could be seen as having its own separate subculture.

This chapter thus moves from a theoretical critique of women's general position within the labour market to the particular factors that affect their employment as engineering and construction professionals. A range of literature sources has been identified though material dealing specifically with women in professional engineering roles is limited. For the purposes of this literature review, therefore, it has been necessary to consider civil engineering in relation to the wider construction sector within which it derives its cultural and operational base (see Chapter Two).

2. Some historical perspectives on work

The way that work is defined and valued by modern British/European society seems to be determined principally by whether or not the activity of work is financially rewarded, giving rise to the concept of paid employment. In the formal sense, if someone is paying tax and national insurance contributions, then they are working and even those who work as part of the 'black economy' (cash work) are seen as economically active. In contrast, those who are not 'employed' in paid work are considered not to be working. Thus, the social status of work depends primarily on whether or not it is paid. This model of work reflects the emergence of the market economy as the cornerstone of

industrialised modern western society. The population is thus broadly divided between those who are economically active and those who are economically inactive, between those who are employed and those who are dependent on the family or the state, either because they are unemployed, or because they are not able to work. Work, then, in modern society is generally regarded as an economic activity mainly undertaken away from the home. Home working, now extended by the computer revolution, is on the increase but despite this the majority of those in paid employment go 'out to work'. This has not always been the case.

In the pre-capitalist era, household production of goods, principally for domestic consumption, was the main form of work, which included all but the very youngest and oldest members of the peasant family. This was true for both rural and urban families so that the home constituted the main unit of production, within what could best be described as a subsistence culture with all members of the family contributing what they could to the production process (Scott and Tilly, 1982). Because the home often 'doubled' as a workshop or site of production, work and family time were interwoven, and thus were more balanced, though women were still expected to take responsibility for the care of children and the preparation of food. In contrast, dominant contemporary conceptions of work render the home invisible (Rich, 1976). This pattern of productivity that was present in the pre-industrial era challenges the ideological claim by some that in the 'golden past' mothers stayed at home to raise children whilst men did the economic work. There were always class differences, however, with women from the upper and middle classes not engaging in any form of work but rather employing and supervising servants to look after their houses and children.

The onset of industrialisation in Britain in the eighteenth and nineteenth centuries, though, brought different forms of separation: in the different types of work done within the factories and the home, and ultimately in the separation of home and workplace. Working class men and women were employed in the factories but the changes in manufacturing also brought the opportunity of home working, particularly in the garment industry, with the rise of ready-made clothing. This was done almost exclusively by women and, unlike in the pre-capitalist era, brought with it the benefit of paid wages, albeit at exploitatively low levels. This exploitation was based on the premise that women working at home could combine work and caring and the work was

paid on a piece-rate system. Thus, women who could work in the new small factories often did so precisely because their income would be so much higher (Grint, 1998).

Waged labour both at home and in the factory gave rise to a shift from the idea of work as the occupation of the family to work as the paid labour of an individual. The opportunity for men and women to engage in large numbers in paid work outside the home sharpened the distinction between the different spheres of activity. The public sphere of work outside the home was controlled by men and was built on a pre-existing inequality that expected women to undertake the bulk of care or 'family' work in the private sphere. This 'family' work could be combined with paid home working that included activities such as taking in sewing and washing so that the home had not yet become the site of consumption and unpaid work as it generally is today (though this too is changing with the increase in the numbers of self-employed professional men and women operating from home).

These divisions had a class dimension. For the middle classes, the concept of separate spheres was already well established by the middle of the eighteenth century. Men were associated with business and public activities which were physically and socially separated from the home whilst women were confined to the tasks of maintaining the household, supervising servants and organising children. They were also legally and by custom under the authority of their husbands, fathers or brothers and without social status in their own right. Their participation in paid work was considered inappropriate (Rendall, 1990). In the later part of the nineteenth century, women were voicing their discontent at their exclusion from occupations dominated by men, and demanding access to higher education and entry into the professions.

The experiences of two world wars radically altered the wages and conditions of work for women in Britain and the need for female labour to undertake essential 'war' work opened up new opportunities. Women were therefore recruited in a whole range of engineering and service industries to take the place of the men at the 'front'. This was seen as their patriotic duty. Having been drafted into previously 'male' occupations for the duration of hostilities, at their cessation, they were expected to return to the home to resume their primary responsibility of reproducing the family (Hattery, 2001: 15).

Several structural and ideological forces were at work during the post second world war period and most influential of these was the concept, established in the nineteenth century, of the male breadwinner as head of the nuclear family with his right to a paid

job. Indeed, it was the vision of male full employment that underpinned Beveridge's post war welfare settlement. Specifically, the image of the nuclear family with a male breadwinner and dependent wife was at the centre of this model of welfare (Williams, 1989:124) and feminists have argued that, still today, these assumptions impact on women's access to the labour market.

However the precedent had been set; women had demonstrated that they could do the work that men usually do, and the resulting change in women's expectations, combined with the provision of universal secondary education, would very gradually open up a broader range of careers and occupational choices for women. Walby (1986) cites these war time employment opportunities, especially for married women, as the dominant factor in changing gender relations. This was so especially after the Second World War because although Beveridge had assumed a primarily dependent status for women, he had not envisaged the huge demand for labour that the establishment of the welfare state would produce. This new welfare sector thus provided a variety of jobs for women in both caring and administrative functions. Some of this work, which was low paid and deemed unskilled (such as that of catering and cleaning), did not prove attractive to the 'home' population and so began the recruitment and immigration of men and women primarily from the Commonwealth to staff the public sector, especially in the areas of health and transport. The 1950s and 1960s were two decades of continued economic growth and an expanding service sector: this meant that jobs were easily available and offered an increase in opportunities for part-time work that suited employers because of the reduced liabilities to employees.

Towards the end of the twentieth century, the thinking of both the New Right and New Labour has given prominence to the debate about whether those caring for dependants (mainly women) should be expected to fulfil the social obligation of paid work either as a route to welfare entitlement or as a duty of citizenship. The position of each has some ambivalence within it. According to New Right ideology it is the nuclear family with a male breadwinner and a female homemaker that should be the main provider of welfare. However, as Muncie and Wetherall (1997) explain, there are contradictions within this political discourse. In reality the view of appropriateness of women's participation in the labour force varies greatly according to household type. For example, New Right discourse prioritises the virtue of paid work but at the same time criticises mothers for working full-time and 'leaving' their children in the care of others. But in the case of

single parent families, which are headed in the main by mothers, women are condemned for caring for their children whilst claiming benefit and being dependent on the state (Fitzgerald, 1983). Thus, the concept of a 'dependency culture', is very much mediated by the nature of the dependency, specifically the 'private' or 'public' nature of the dependency. The distinguishing feature of New Right ideology is that it is legitimate for a woman to depend 'privately' on a male partner for her economic survival, but 'public' dependence on the agency of the state is not acceptable (Lister, 1997). Middle class women do not escape comment within this discourse that prioritises caring over professional fulfilment. Their roles of carer and worker have to be balanced to provide the underpinning nurturing of the family around which any professional work has to fit. This feature of New Right thinking holds particular relevance to this study.

New Labour has sought to link family and employment policy and has positioned work at the heart of its welfare reforms. For example the New Deal for lone parents (mainly lone mothers) is designed to facilitate a return to work. The 'Working Family Tax Credit' is another example of how paid work lies at the heart of New Labour's reforming agenda which is seeking to establish an anti-dependency culture. Thus there are signs that the traditional ambivalence towards mothers with young children taking paid employment is gradually being removed.

The above discussion indicates that the notion of women 'not working', was in fact more ideological than real. What also emerges is the way in which work, in the context of waged labour, has established its meaning as 'employment'. This then, raises the question of how work for which there is no financial remuneration can be attributed social value. Such work, often termed domestic labour, encompasses many tasks and responsibilities, ranging from the care of young children and elderly relatives to housework, shopping, cooking and ironing. This constitutes 'family work'. As Grint states "*since almost every activity undertaken without payment in the home is also undertaken for money in the formal economy the distinction between work and non-work is seriously flawed*" (Grint, 1998:30).

It should also be remembered that such work is not only undertaken by women who are not engaged in waged labour but also by women in paid work and, increasingly, many of these are working 'full-time'. For these women there is a double burden of both paid and unpaid work. Folbre summarises the position thus: "*even where women enter the*

wage labour force in large numbers, non-market work remains economically important, and women continue to perform a disproportionate share” (Folbre, 1994:91).

There thus seems to be no division between work and home that is free of ideological expectation. One aim of the research is to examine how women manage the cultural expectation of motherhood while developing a career as civil engineers. The ideology of motherhood has many strands of emphasis (beliefs about child rearing, psychological and cognitive models of child development and intensive mothering), but it does not include women providing financially for the family, as part of being a good mother (Hattery, 2001). The concept of mothering is centred on responsibilities rather than rights, so that mothers are expected to be selfless in terms of their own needs and find personal fulfilment in their caring responsibilities (Gilligan, 1982). Apter (1993: 109) refers to this as the “*rigidity of maternal responsibility*”. This is especially the case in a ‘nuclear’ family structure where the assumption still prevails that women do not ‘have to work’ out of economic necessity, and those that decide to do so, make this choice for (other) reasons of self-gratification. This ideology is very powerful in the way it conditions both men and women into making judgements about what is right and possible for women who wish to have the dual role of mother and paid worker. Furthermore, because the nuclear family arrangement has been viewed as ‘natural’, it has assumed legitimacy as the ideal way of organising ‘work’ roles within the family. In fact ‘work’ within the home was never recognised as *work* within male-oriented sociological discourse and it was feminist writers such as Oakley (1974) who theorised domestic work as having economic as well as social value. The expectation of the ‘ideal’ nuclear family form takes no account of the way in which family units have changed in modern society. Not all households have a man at their head to command the male ‘breadwinner wage’ (and in fact this has never been universally the case with, for example, many women raising children alone following the death of their husbands in times of war). Figures for 2001 show that 23% of families with dependent children are headed by a lone mother and 3% by a lone father (Social Trends, 2002).

The assumptions that underpin the nuclear family model do not take account of increases in women’s educational achievements that equip them for professional careers outside the home and increasingly we are seeing professional women working full-time whilst raising children. In fact employment rates (full and part-time) generally amongst women have risen dramatically in the post war period from 47% in 1959 to 70% in 2000

with 18% of women whose youngest child was under five working full-time (Social Trends, 2002).

The longer history of men in the paid labour force and the exclusion of women from the professions until the late nineteenth century gives rise to the expectation that it is men who will tend to monopolise top positions in most professions and occupations. This does not mean that women never make it to the top, but rather that they do so by virtue of individual ability and circumstance despite their position of structural disadvantage within a labour market that generally 'denies' caring responsibilities (Spencer & Podmore, 1987).

The dominant work model within the UK is one that assumes that workers (men) will invest more in their 'human capital' given that there will be no other claims (such as domestic duties) on their time and effort (Crompton, 1997). Conversely for women, this model assumes that they will invest primarily in their domestic role that has high non-market return (Jacobsen, 2003: 163) and thus will economise in the effort they put into paid employment. In other words, women are assumed to be carers first and workers second. This is the basis for the gendered segregation of work which gives rise to the concept of 'women's work' that is socially constructed to 'fit in' around caring responsibilities. In fact we are so accustomed to a work force segregated along gender lines that we hardly notice it until we come into contact with a female electrician or even a male dinner 'lady'. Of relevance to this study, it was reported in 'Engineering First' published by the Engineering Council (February, 1999) that Mo Mowlam used the language of gender stereotyping to challenge the status quo when she declared at a WISE launch in Northern Ireland that "*science, engineering and technology is women's work*".

The segregation of work into gendered categories will be discussed in more detail in the section that follows. However, it is relevant to mention here that the assumptions that place women as carers first and workers second applies equally to professional women as it does to those women in occupations classified as unskilled or semi-skilled. This leads us to consider in more detail the notion of patriarchal structures in both the public and private sphere as a constraint to women's progress in the labour market.

3. Public and private patriarchal structures

Before embarking on the narrower discussion of why professional women become marginalised in their working environment, it is necessary to review some general aspects of labour market theory from a feminist perspective. There are a number of different ways in which to conceptualise gender relations, but for the purposes of this discussion I will draw heavily on the work of Walby (1990) and Cockburn (1991) and their conceptualisation of 'patriarchal structures' both in the home and in the workplace. The introduction of gender theory into analyses of women's employment, with concepts such as the sex-gender system (Rubin, 1975) has been crucial to broadening the analysis of work to encompass both the waged labour process in the public sphere and the unpaid work of reproducing the family in the private sphere. Feminist discourse characterises the subordination of women as systemic or structured and therefore not just located within individual experience. Some feminist writers have analysed the overarching concept of patriarchy (a system of male authority) to identify particular sites of patriarchal relations as being at the root of women's subordination. Brownmiller (1976) and Firestone (1979) argue that women's oppression is primarily due to a universal male control of women's bodies and sexuality with women's reproductive role at the core of the problem. Spender (1980), on the other hand, has focused on the use of language as the major weapon in patriarchy's armoury, and she has extensively theorised the way that patterns of language privilege men and render women invisible. Barrett and McIntosh (1982) have argued the necessity to critique the family, asserting that only when the sexual division of labour within the family is eradicated can women take up an equal economic role with men. With the exception of theorists such as Firestone, there is broad agreement amongst feminist writers that differences between men and women in all forms of social systems are not primarily biologically driven, but rather are socially constructed, with patriarchal structures acting as the organising instruments of these differences. However, it is the apparent and real biological differences between men and women that have been used to justify and underpin the structure of social arrangements, whereby women are defined by their reproductive capacity and men by their productive capacity. The consequences of this continue to operate in the contemporary labour market and are reflected in a wide range of issues such as pay inequality, part-time working, management, segmentation, promotion, tenure and professional development opportunities.

Walby (1990) has identified six sites of patriarchal relations that she sees as co-relational in their impact on women. These six structures refer to patriarchal relations in the home, in the waged labour market, in the operation of the state, in the propensity for male violence against women, in the culture of 'compulsory' heterosexuality and lastly in the cultural values found in art, education, science and religion. Although all the sites identified by Walby are relevant to this study I will concentrate on the first two and to a lesser degree on the issues of cultural norms and the continuum of male violence.

Walby has built on the perspective of earlier writers such as Hartmann (1976) and Beechey (1987) who argue that capitalist societies are made up of two structures, patriarchy and capitalism. Cynthia Cockburn (1991), in her study of sex equality in organisations, has taken a similar position, arguing that capitalist societies are predicated on the existence of both domestic and industrial capitalism. The former exploits the unpaid labour of women in the home and the latter requires the labour of an expendable work force at the lowest possible cost, in the pursuit of profit. She sees these two systems as separate but closely connected, with men's domination over women as central to both. Each of the two systems reproduces structured inequalities and the institutional oppression of women. She makes clear that this oppression does not derive simply from individual actions, but is built into structural and institutional patterns and organisational policies.

Dual systems theory as part of feminist scholarship argues that women's oppression arises from two separate systems at home and in the workplace and Walby identifies the workplace as the main site of women's exploitation. She traces this exploitation through a range of exclusionary practices and subscribes to a predominantly (but not exclusively) one-way causal relationship from paid work to home, so that women's position in the family is largely determined by gender inequality in the labour market rather than vice versa (Walby, 1990:56). The main tenet of this argument is that for many women, especially those from the working class who are unskilled (this in itself being a socially constructed gendered category), the prospect of finding work that pays enough to allow them to support themselves and any dependants, is remote. This now applies to many unskilled male workers who also find themselves in marginalised low paid employment, unable to provide the still expected 'family wage'. Thus, according to Walby many women are discouraged from entering the labour market, choosing instead the option of marriage or 'partnership' as a means of economic survival. Thus, their

status as independent worker is traded for the role of unwaged dependent wife. Middle class professional women may also choose to withdraw from the labour market despite being able to command a reasonable salary (Williams, 2000: 14-16). In making this choice they also trade their role of professional worker for that of dependent partner but can expect a higher standard of living than working class women in the same position. Increasingly though, now, the split is between dual income households and 'no-income' households with the latter characterised as part of an underclass (Yeandle, 1999).

Walby's conceptualisation of patriarchal structures within employment focuses on mechanisms of exclusion and segregation. The term exclusion describes actions, practices and structures designed to refuse women entry to certain types or areas of employment. In modern society, formal exclusionary practices to keep women out of certain professions or occupations are not permissible within the law but legislation does not protect women from the inequities that can result from job segregation. Segregation takes different forms. Horizontal segregation of the labour market is achieved by the gendering of many jobs, particularly in the caring and service sectors which has come to be regarded predominantly as 'women's work'. Catering and cleaning staff, health care assistants and retail workers continue to be poorly paid with women holding most of the jobs in these areas (Social Trends, 2002). Much of this work is part-time and offers limited training and opportunities for progression. The most 'responsible' jobs are considered unsuitable for part-time or job-sharing arrangements and are constructed as full-time jobs only. In the professional sector of care women often find themselves confined to the lower end of the pay and opportunity scales. Social work is a good example of this where occupational segregation is based on a 'sexual division of labour', with women holding the majority of lower status, lower paid jobs whilst men occupy the majority of more highly paid, higher status positions (Coulshed and Mullender, 2001). The vertical division of labour refers to the degree to which men and women are represented amongst the leadership and management of professions and organisations. A study by the Cranfield School of Management reported that women are losing ground in Britain's biggest companies. Only fifty seven per cent of the FTSE-100 companies had a female director in 2001, compared with fifty eight per cent in 2000 and sixty four per cent in 1999.¹

¹ Guardian 'Editor' magazine, 1 December 2001

I am not convinced by Walby's view of the priority of causation as I see women's role as reproductive agents (both as bearers of children and as daily reproducers of the family) as the dominant (though not the only) factor influencing their potential for waged work, so reversing this causal relationship. Walby's view does not for instance explain why women with good human capital (this being the sum of an individual's employability including education, training, experience and personal skills) are still not able to progress at the same rate as male colleagues or why the gender gap in earnings continues. However, she does consider the effects of exclusionary practices in the workplace which might account for this 'under achievement'. An alternative view is that women are regarded by employers as potential liabilities because of the expectation that theirs will be an interrupted work pattern as they respond to demands to care for dependants (Cockburn, 1991). Thus, what is in fact problematised is a woman's relation to the private sphere of the home, as we are still socialised into assuming that it will be women, not men or the state, that will bear this responsibility. Cockburn (1991: 76) thus concludes that women are '*defined in domesticity*'. Pascall summarises the nature of the problem:

"child-care is at the heart of the sexual division of labour. Responsibility for children keeps women isolated in the home and disadvantages them in the labour market. While raising children must often be more satisfying than the male side of the labour bargain, the ramifications...spread into every area of women's lives...Motherhood is central, both in the general social concept of woman, and in most women's experience. It casts women into marginal positions in public life. In this it is quite unlike fatherhood" (Pascall, 1986: 96-97).

One material consequence of this is the failure of women to break through into industrial leadership positions in significant numbers and another is the continuing disparity in comparative pay rates between men and women. Figures for 2000 indicate that the hourly earnings of women working full-time was 82% of those of men (Social Trends, 2002). Walby's analysis of women's subordinate position in the labour market centres on factors that can be grouped as structured constraints; these include exclusionary practices which operate on a number of levels (cultural, social and institutional) to deny women employment opportunities. This points to the workplace as a contested site and applies to female-dominated work (such as nursing, for example) as well as to male-dominated occupations (Davies, 1995; Halford et al, 1997). The next section considers the nature and extent of these practices with particular reference to the construction sector.

4. Subcultures

This section will look at how the workplace and the institutions and organisations that frame the world of employment have within them a range of attitudes, practices and behaviours which can be described as constituting a subculture. I have used the term 'subculture' rather than culture to suggest the complex 'layered' nature and effect of these practices that operate on many levels within both organisations and professions. A brief review of the place of subcultures generally in the workplace will argue that masculine values predominate. A more detailed review of how subcultures are created and represented within male-dominated professions follows and the section concludes with a focus on how specific subcultures within science, engineering and construction create a marginal place for women.

Conventional economic theory that assumes gender neutrality in employment contracts hides the reality of very gender specific practices, so a woman's relation to the labour market cannot be understood without reference to her gender (Webb, 1982). Cockburn's view is that women occupy a dual position of inferior status; their disadvantaged position in the workplace arises from exclusionary practices and their perceived and sometimes actual lack of human capital reduces their status in the home. The assumed dependency of women on a male partner completes the cycle of disadvantage.

Employers exploit this by structuring their work force to incorporate female jobs that are part-time, less secure, poorly paid and often temporary. This forms part of what Pateman (1988) calls the 'sexual contract'.

Pateman traces how citizenship rights have developed differently for men and women. She argues that men's rights and women's subordination were created through the original sexual contract enacted within marriage, which resulted in civil freedom being a male right exercised through active citizenship and participation in public life.

Women, on the other hand, had a dependent status and only had access to the public realm through their husbands. In reality then, civil freedom has not always been universal, but was both gender and class specific. Pateman thus argues that, although women now enjoy citizenship rights, it is the sexual contract that ensures the continuing symbolic representation of political power as masculine. Systemic male power which was based on 'husband' and 'father' right, has been replaced in modern society by general male sex-right (Cockburn, 1991:28).

Cockburn extends Pateman's concept of the sexual contract into her discussion of the ways that men and women's bodies are commodified as labour power within the capitalist waged labour process. She argues, though, that for women it is specifically their sexuality (which itself is socially constructed) that is identified as the attribute, and is implicitly calculated within the perceived total sum of their value to employers. All business engages in selling, whether it is a product or a service or an expertise, and the ways in which women's bodies are used to transact the sale are not necessarily clearly understood by those involved in the process. Wajcman's (1998: 117) view is that it is more difficult for women working in male-dominated workplaces to resist this commodification of their sexuality than for women working in occupations where they are in the majority.

Wajcman contends that women are used in a variety of ways to advance the cause of organisations and sometimes this occurs almost imperceptibly, as women are manoeuvred by male colleagues into roles or situations where it is their femaleness that is seen as the key influence, not their technical or intellectual competence. She characterises this as '*gender as performance*' (Wajcman, 1998:119) with organisations being one site in which the 'doing of gender' routinely occurs. I argue later that this applies within civil engineering too, despite the fact that there are very few women available, at least on a professional level, to undertake these image-creating roles. The impact of female sexuality within civil engineering can be seen as multifaceted, with a woman being seen as potentially 'useful' in closing a deal with a client but acting as a distraction on a building site.

A woman's appearance in terms of style, her tone of voice, the way she dresses, in short her femininity, all form part of her worth. If women's bodies can be theorised as forming part of an organisation's human capital, their sexuality is at the same time problematised as potentially destabilising the control exercised by companies over their staff. Cockburn focuses on organisation theory to analyse the relationship between what initially might be viewed as two totally unconnected, or in some accounts, incompatible, phenomena; sex and organisation (Cockburn, 1991: 138). She is critical of the theoretical perspective that positions organisations as hierarchical, instrumental and purely task oriented, devoid of any kind of emotion or sexuality. This 'purist' theory of organisations cannot account for sexual harassment in the workplace for instance, and certainly does not incorporate the plethora of informal relationships which go

unacknowledged within this theory, but which nevertheless in practice underpin the regulated procedural formality of organisations. Cockburn's (1985) view, in contrast to traditional organisational theory, focuses on emotions and feelings that run through all organisations and find expression in the 'social' culture of the workplace. This can result in the gendering of roles with the boss/secretary relationship as just one example. This is another representation of the 'sexual contract' and also a reflection of the heterosexualised subculture of corporate life.

As women continue to struggle with negative stereotyping of their roles within corporate institutions, maybe it is prudent to ask whether this can be exploited to women's advantage. Should women use their female attributes and differences from men to try to advance their individual position or does this just reinforce the negative stereotype? Gherardi (1995) takes the view that many women do not want to banish sexuality from the workplace because having a sexualised status is in fact better than having no status and 'being' invisible. Sometimes it can even make an otherwise dreary or monotonous workplace routine feel like fun. However, the dynamics of sexuality within organisations have to be considered within the framework of patriarchal power relations that underpin the structure of the labour market. This question is touched upon by the women interviewed for this study (see Chapter Six). Cockburn warns that the politics of gender difference or separation in the workplace can obscure the very real differences between women and also can strike at the heart of the equality debate. Women face difficult choices when deciding how to respond within a work environment that ostensibly places sex outside its gates, yet in reality is deeply sexualised. Even the slightest acknowledgement of their sexuality may be dangerous, laying them open to not being taken seriously for their skills and career potential. Cockburn (1991:159) concludes that it is only as women become more organised as a grouping within organisations that it will be safe to re-introduce emotion and sexuality into the workplace on their own terms. As far as male-dominated occupations are concerned the concept of 'critical mass' may apply and this is discussed later in the chapter.

The way that men and women behave within organisations significantly affects the culture of the workplace. Culture involves meanings, assumptions and ideas that are taken for granted and are difficult to question (Alvesson & Billing, 1997). The network of beliefs, assumptions, organisational goals, rewards, constraints and penalties all combine to form workplace culture which is then mediated and moulded by the

particular institutional setting. Culture can thus be understood as the level at which different groups develop patterns and relationships through a shared set of beliefs and expectations and the style it adopts is translated into specific subcultures with their own cultural claims. Cockburn (1991), for example, argues that there are different constructions of masculinity within organisations across different employment sectors that serve as barriers to women's progress. Masculine identity in the workplace is itself socially constructed and is subject to a range of cultural and organisational values. In some contexts it is male hierarchical authority that is powerful; in other settings, such as construction, it is physical strength that is the dominant form. The male civil servant, for example, might exercise authority in a very traditional, hierarchical way different from the manager of a high street retail company dealing with a range of employees from van drivers to sales staff. In the latter case, the exercise of male power is negotiated, and less imposed by the structure of the business itself. These different forms of male authority are expected and seen as appropriate within the particular setting (and are difficult to challenge). In male-dominated professions such as civil engineering, women have no history at the top so male authority is regarded as the norm. The light hearted sexist joking of the boardroom combined with other more subtle masculine behaviour that may undermine female colleagues finds a different expression on the building site where overt sexist banter and innuendo is regarded as perfectly normal. Thus, women in civil engineering are forced to move between these various forms of masculine identity. Expanding on Cockburn's perspective on the place of sexuality within organisational life, the wider issue of sexual relations at work has become a focus for feminist debate. In particular, some feminists have used the issue of sexual harassment in the workplace to explain women's subordinate status and inferior pay and conditions in the paid labour market (Segal, 1990; Stockdale, 1996). The problem of sexual harassment at work is faced by women across a whole range of occupations, not just women who are more visible because of their minority presence in a particular industry. Knapp and Kustis, (1996) claim that about half of all women experience some form of sexual harassment at work and that this damages organisations as well as individuals.

The meaning of the term 'sexual harassment' is contested and subject to a range of cultural perspectives. One very broad definition offered by Stanko (1988) is that it constitutes any kind of unwanted sexual attention. Adding the dimension of frequency to Stanko's definition, sexual harassment can be characterised as persistent unwanted

sexual attention and it is this definition that I have used in analysing the women's stories. Smith (2000), though, argues that sexual harassment is essentially gender harassment, and includes any behaviour by men that undermines women; this need not have any sexual element at all. Sexual harassment, then, as an instrument of patriarchal power, in terms of this definition, has a very broad base which I feel is too vague to be useful.

The issue of sexual harassment is highly contentious, not least because sexuality and associated behaviours are clearly subject to personal interpretation and the issue of sexual harassment has sometimes been confused with sexuality in general. However, there is clear evidence that the behaviour that an individual defines as sexual harassment is gender-related, with women consistently defining more experiences as harassing than men (Stockdale, 1991). The damage experienced by the targets of sexual harassment can take many forms, including lower self-confidence, loss of motivation, reduced productivity and deterioration of interpersonal relationships (Knapp & Kustis, 1996). These effects demonstrate that there are also associated costs to organisations of this kind of behaviour.

For many women, managing sexuality within an organisational setting is part of their every day working routine and specifically making judgements about personal appearance is part of this management strategy. Because women's sexuality can be perceived as more important than their designated work roles, women dare not leave their image to chance. Adkins (1995) notes that women are constrained by a set of criteria relating to their appearance in a way that men are not. Where these strategies fail, she argues that women are seen as the cause of the problem and made accountable for the inappropriate actions of male colleagues. Crompton (1997) argues that male sexuality, by comparison, is much less visible in organisations, as they occupy their corporate positions by right and have majority status. The 'genderless' individual is in fact male.

This raises the question: can we expect women working in male-dominated environments, who are seen as 'role-deviates', to report more sexual harassment than women in traditionally female jobs? Studies of different workplaces such as that by DiTomaso (1989) have found that women are more likely to experience sexual harassment as members of male-dominated occupations. Crompton (1997) also endorses this view. Hadjifotiou is of the view that the form of the harassment might be more

sophisticated in the professional setting (as opposed to the shop floor) but it is none the less effective.

"Although women in management and the professions may appear to have successfully entered a man's world, their position within it is precarious. Despite their jobs, their identity as women continues to condition their treatment at work. High status does not eliminate sexual harassment" (Hadjifotiou, 1983:49).

Cockburn's (1991:141) findings also support this. She recounts how a newly appointed woman executive within a large organisation was systematically 'cut down to size' by sexually harassing behaviour from a senior male colleague. This left her stunned and powerless to act because the incident occurred away from the public gaze and could not be corroborated.

There is evidence that women are resisting this kind of threatening male behaviour (Crompton, 1997:117), but challenging these practices can be problematic. Confronting this kind of behaviour is often a personal and individual matter and can leave women open to further discrimination. Recourse to the law is another option but the way that the legal process often works, in practice, to discredit women who invoke the law as a means of redress is well documented (e.g. Smart, 1989; DeLaat, 1999). Women can be regarded as 'unreasonable' if the process fails and be subject to further harassment (Hadjifotiou, 1983:22). This characteristic of 'reasonableness' is imbued with the sense of a cultural norm that incorporates a spectrum of social attitudes and behaviours which, though not culturally specific, are gender specific. Kelly argues that it is the claim of 'normality' for this undermining male behaviour, which lies at the heart of the problem. *"By defining harassment as normal, men justify their behaviour and when it is challenged are able to dismiss (read redefine) women's perceptions"* (Kelly, 1988:104).

It is important to recognise that sexual harassment is one representation of sexuality within organisations and operates on both a structural and an individual level as a power issue, with harassers generally possessing organisational power over those whom they harass. Thus, it is precisely because of this power differential that it has proved so difficult for 'victims' (mainly women) of this behaviour to confront and challenge these abuses.

Professional subcultures

Thus far I have discussed subculture within the general context of institutional life but these representations can be applied more specifically to male-dominated occupations

and professions. I will start first by considering what is understood by the term 'profession'. Paid employment may be characterised variously as a job, occupation, career, profession, or simply as work. The language of work thus suggests different expectations of paid employment ranging from being a necessary means to an end with little personal investment in terms of training or ongoing development to work defined as professional activity, involving underpinning academic qualifications with further structured training as a way, often, of developing practice. The concept of profession thus carries higher social status and an assumption of greater financial reward and responsibility with opportunities for progression. Associated with this is greater autonomy in organising work patterns and the assumption that professionals are responsible for their own practice and that their behaviour will conform to certain norms arising from the functional requirements of their role.

Evetts (1996: 36) points out that every profession offers a range of typical careers, such as moving from practice to management or to independent consultancy. Often, those who describe themselves as professionals belong to distinct occupational groups such as doctors, lawyers and teachers. Many professions have a system of registration and regulation which acts as a licence to practice and this is overseen by an association or form of governing body that admits those who fulfil the entry criteria and excludes those who do not. Abbott (1988) referred to these bodies of expert knowledge as professional jurisdictions where both the culture and structure of a profession, as an applied discipline, is created and maintained. However, with the broadening of further and higher education and a move towards a more differentiated job market, the boundaries between professional and non-professional occupations have become blurred. For example, a highly successful and wealthy business executive is likely to regard him or herself as a professional, despite lacking a university education and not being a member of a particular professional group. It is the material achievement and resulting lifestyle that is being accorded the 'professional' label, so that being a member of the professional class is a social construction. It is, in fact, the features of achievement and associated social status that allow for the broader meaning of what is now termed 'being a professional'. As a response to this, individual professions are increasingly intent on preserving their credentials and identity, thereby resisting any dilution of their skilled expertise. However, we are currently seeing fire fighters demanding a 40% increase in salary citing their professional life-saving role as essential

and highly skilled. Such claims of professionalism may extend the concept of professional identity beyond accepted traditional meanings.

The segregation of men and women into different occupations (horizontal segregation) and the distinction between the genders in terms of positions of authority (vertical segregation) is still very marked in Britain. However, the proportional representation of employed men and women in occupations formally classified as professional has become almost equalised with 13% of employed men in the professions and 11% of employed women (Social Trends, 2002). Although overall men continue to dominate in the professions they do not do so in *all* professions. Women are more highly represented in education, for instance but men continue to dominate the engineering, construction and transport professions (Social Trends, 2002). This suggests that there is unequal access to particular professional roles for women or that women are choosing to enter certain professions and rejecting others.

Spencer and Podmore (1987: 2) have identified ten factors contributing to the professional marginalisation of women in male-dominated professions. These are linked to issues already discussed. The ten factors are: stereotypes about women; 'women's work' (these have a combined effect suggesting that women have specific attributes and are therefore more suited to particular types of work in 'caring' and support roles that are designated as 'unskilled'); stereotypes about the nature of professions and professionals; the sponsorship system; informal relationships (these serve to nurture and underpin individual progress and give access to informed power bases); lack of role models and peers; the concept of professional commitment; the unplanned and interrupted nature of women's careers; clients' expectations; fear of competition.

Although not all the factors are of equal relevance to my investigation, they are useful in that they offer some grounded insight into the different obstacles that many women face when they join a male-dominated profession. Some factors relate to the labour market approach to understanding why women are subordinated and others reflect the 'defined by domesticity' approach. These factors point to the powerful subculture of professions which Spencer and Podmore characterise as the site of objective achievement within a linear career path that itself is grounded in high levels of commitment. They suggest that professional careers are prioritised and nurtured in both formal and informal settings and are likely to be taken up by men. Some professions carry particular stereotypes of their own and although these can be historically rooted and may not apply

in modern society, nevertheless the stereotype prevails. One example would be the construction industry which is traditionally characterised by the building site imagery of heavy physical work and unpleasant working conditions, making it unsuited to women. The polarisation of expectations of men and women working in strongly identified male professions can lead to a type of gender ghettoising within professions. Thus, horizontal job segregation as well as vertical segregation continues to operate across the professions with their effects being more profound for women working in male-dominated areas. Lawrence (1987) has identified “ghettoism” as a distinct subculture within medicine whereby women doctors are expected to want to specialise in treating ‘women’s problems’ as GPs. This is a form of job segregation within a profession. Maddock writing in 1999 confirms this:

“medicine and medical schools remain very male and medieval institutions, which actively encourage female students into community health and primary care and discourage them from entering specialities such as surgery. All surgical specialities require a very special determination from women medical students” (Maddock, 1999:76).

Medicine has been singled out as a particularly extreme case of patriarchal exclusionary closure, whereby overt and covert discrimination has kept out all but a handful of women in the areas of high status specialisms. Although increasing numbers of women are entering medicine Riska (1993) concludes that:

“women more often than their male colleagues tend to practise in primary-care specialities, in low-rank positions, and in bureaucratic settings as salaried employees. Male physicians have maintained dominance over high-status specialities and practice settings that involve higher independence and incomes than their female colleagues have been able to achieve” (Riska, 1993:5).

This ‘feminisation’ of medicine has continued, with figures for the year 2000 showing that women now constitute just over fifty five per cent of first year medical students (HESA Student Returns). Whether the increasing numbers of women entering the profession can result in their moving into high status and high earning positions requires further investigation but on a theoretical level can be linked to the concept of critical mass which is discussed later in the chapter.

The concept of ‘appropriate’ work has been taken up by Greed (1994) in her critique of women’s position in planning. She points out that although women are to be found in almost every area of practice, they are usually on a low grade and have the role of ‘helper’ rather than any substantive design or managerial role. Also, women are

expected to be involved with any aspect of the job concerned with 'prettifying' or aesthetic enhancement, their role being to 'dress things up' (Greed, 1994: 138).

Having focused on work as a social construction I now move on to consider the particular issue of women as engineering and construction professionals, starting with a brief critique of the role that science plays as a preparation for a career in the applied engineering disciplines.

Civil engineers very much see themselves at the 'elite' end of the construction process, identifying their skills as originating within the context of 'pure' science (Greed, 2000). Along with architects they are the aristocrats of the construction industry (Greed, 1999). The paucity of women taking up the study of science and technology continues to be of concern to policy makers and the trend for women to reject science as a career choice has for sometime occupied the attention of government (Guardian, 11 October 2002). Hilary Rose (1994) in developing a feminist critique of scientific knowledge and the way that this is practised, has provided a major contribution to understanding how women have, until very recently, been systematically denied admission to the elite scientific academy. All civil engineers are required to have a scientific educational background from school involving qualifications in one or more of mathematics, physics, chemistry, technology and design or computer studies. An integral part of this is the training of the analytical/rational mind towards adopting the theoretical values of 'pure' science. 'Applied' science is regarded as having lower status (Rose, 1994:32).

Throughout history 'pure' science has been characterised as a male activity (Wertheim, 1997) but in modern western society science, as an applied discipline, underpins a whole range of industries including manufacturing, defence, energy, health care, transport and pharmaceuticals and has strong links with the civil engineering discipline.

In a series of contributions entitled "Voices from Women in Science" (Engineering Council, 1996) women offer accounts of their working experiences as scientists. For those women working as researchers or lecturers in academic institutions, the complex mix of attributes and achievements required to give any chance at all of advancement seemed particularly challenging. Often, too, the research issues that women are involved with are defined by male colleagues, so that women feel like the junior partner in the process (Keller, 1982). The women focused on the relentlessly competitive environment in which they worked and on the time involved in ensuring that they were 'not left

behind'. They compared their experience with that of male colleagues who, less constrained by family commitments, were more able to take up available career opportunities and undertake a greater amount of research. This was in contrast to the teaching role that was accorded a much lower priority. These women's accounts indicate that it is the social relations within which science functions, rather than the discipline itself, that is problematised for women.

Although studies investigating women's role as engineers are limited, some interesting work has been done in this area. Carter and Kirkup summarised their findings from interviewing thirty-seven women engineers both in the UK and in the USA. The women interviewed included civil, mechanical, transport and chemical engineers working in a variety of industries. Many interviewees reported a range of difficulties they had encountered at work, including issues such as image and dress code, sexual harassment and the almost constant need to justify their professional competence in a formerly all-male workplace (Carter and Kirkup, 1990). The masculine subculture of engineering presented these women with the challenge of 'fitting in' or leaving their chosen profession.

Drawing on the findings of Carter and Kirkup, my own small-scale study conducted in 1995 (Watts, 1995) sought to compare the experiences of young female and male candidates working towards becoming chartered civil engineers. No significant differences were found in the experience of the process between the men and women, though all the men expected that the 'maleness' of the profession would inevitably create problems for women applicants. Their view was that the male tradition of the industry underpinned a grudging acceptance that women would increasingly be part of their ranks. This finding was significant because, even though the women did not acknowledge this different expectation, the male engineers clearly felt that women would have to work harder to demonstrate competence to gain recognition. The view of the women was that women engineers have a difficult time within the profession but so also do some men. The acknowledgement that male progress within the profession is not always smooth appeared to be one way that the women could cope with women's unequal treatment.

Although there is little literature specifically about women in professional engineering roles, especially within the UK, some research has been carried out into gender issues more widely within construction and the building professions. In particular, Greed has

discussed the highly gendered nature of the construction industry which she has conceptualised as being fragmented and tribal comprising a wide range of disciplines, all with their own subculture (see Chapter Two). The importance of culture in moulding work practices (both formal and informal) within the construction industry has been found by Druker and White (1996) to be highly significant. They argue that patterns of behaviour within an organisation and, to an even greater degree, within a particular discipline or subculture are learnt and become deeply embedded within the consciousness of those who work within that specialism. Where an organisation includes a range of specialisms, one could therefore expect to find a corresponding range of subcultures each with its own legacy, values, behavioural norms and even, in part, its own language (see earlier). This concept of organisational and specialist subculture has been extended by Druker and White to include what they describe as a “*unique project-based culture*” within construction (Druker & White, 1996:155). This suggests that projects (especially the larger and longer term ones) can create their own culture to adapt to a particular set of challenges and circumstances. The creation of this new brand of subculture may be necessary as part of the multi-disciplinary approach to delivering construction projects. Although a project subculture may be born out of the necessity to harmonise disparate ways of working, it still may be difficult to manage. Increasingly companies seek to win work as part of a combined bid, so that partnering has now become mainstream. One effect of this has been the blurring (albeit temporarily) of organisational boundaries, so that a new set of alliances and allegiances are formed in the interests of completing the job on time and within budget. Loyalty to a project can therefore be instrumental in mediating the power of subcultures present within the ‘building team’.

The concept of subcultures within construction has been developed by Greed (1991) who in her early work focused her attention on the quantitative and qualitative experience of women surveyors as construction professionals. Her study revealed that a hierarchy of power and suitability exists within the surveying subculture, just as it does within other construction professions and male-dominated occupations. Thus Greed describes how some areas of surveying practice are regarded as being more suitable for women than others.

" Another area which women are seen as 'naturally' fitting into is 'property management' - not management in the executive sense, but in the sense of 'caring for' property almost as an extension of the traditional housewife and 'helpmeet' role. For

example, such women will be concerned with keeping the tenants happy in a shopping complex development and dealing with rent reviews, servicing contracts, and public relations. It should be noted that in none of these specialisms are the women directly involved in actually planning, building, designing, or making developments happen, nor in large-scale investment and risk-taking activities. All this is mainly reserved for the men" (Greed, 1991:139).

Greed emphasises the importance of the power of these sub-cultural groups to determine who gains full membership of the group and who is excluded or kept on the margins.

The key factor appears to be the willingness of an individual to 'fit in' with the mainstream cultural values of the group, thereby gaining acceptance (Greed, 2001:8).

Gender is a major determinant of who is likely to be the 'right type' (Greed, 1994:153) with women being regarded as intruders. However, as Langford et al (1995: 185) comment, men too have to have to 'fit in' and some men may also not feel entirely comfortable as 'one of the boys'. This suggests an 'unbending' industry with a fixed set of cultural practices and expectations. Some women do achieve assimilation within the dominant culture and, as Greed points out, we should not expect that women will necessarily have a different value or belief system than that held by their male counterparts. On this basis, therefore, assimilation may not be problematic for some women, who may have little difficulty in aligning themselves with the 'macho' cultural values pervading construction. However, acceptance within a subculture is an external as well as an internal process and is therefore also dependent on being accepted by those already present within the subculture. Linked to this, Greed's research shows that women who hold radical views and challenge the status quo are less acceptable members of the construction industry; they are seen as different and are unlikely to reach positions of seniority. Professional identity is culturally constructed and is forged through engagement with and allegiance to prescribed values and practices. Becoming a member of a particular group or subculture means learning to adopt the values and behavioural patterns of the group. Anyone questioning these sets his or her self outside the 'norm' and is likely to experience some degree of exclusion.

Although one could argue that international comparisons are of limited value in trying to gauge whether women's qualitative experience of working in construction is different across national boundaries as cultural and business practices may vary greatly, Eisenberg's (1998) account of women in the USA working as construction tradeswomen and artisans offers some insight into how their minority position is experienced within the particular subculture of the construction site. Eisenberg portrays

a workforce under siege from male colleagues in the form of sexual harassment, victimisation and other forms of discrimination. Her account suggests that women may work as construction operatives but they do so only as 'guests' of the subculture. My own research argues similarly in relation to women's professional roles within construction.

5. Work/life balance

The issue of work/life balance is a key theme of this research and discussion about how this can be achieved in the face of conflicting demands from career and family has been the focus for many researchers and commentators (Walter, 1999; Williams, 2000; Hattery, 2001). Spencer and Podmore (1987) consider this issue in relation to the concept of professional commitment, which is a further factor marginalising women in the professional sector. They argue that the concept of professional commitment that dictates that work must come first and personal or family life has to be fitted around this priority has increasingly become the norm, particularly as part of the corporate ethos in the private sector. Associated with this is the culture of 'presenteeism'. Many women do not wish to assume this 'life value', but for those that do (especially if this is combined with motherhood) there is an expectation that this is inappropriate (Figs, 1994: 90).

Currently the UK seems to be in the grip of a long hours work culture where employees have to demonstrate a relentless commitment to work. Franks reports that:

"In a survey of two thousand parents, undertaken by Parents at Work, on the question of pressure of work, 64 per cent reported that they regularly worked longer hours than they were contractually bound to do, due to pressure of workload and the culture of long hours. They made the familiar observation that even when there is no concrete work to be done, the way to show commitment is to stay late. Nobody dares to be the first to leave" (Franks, 1999:72).

However, where there are possibilities for more sensible working hours and even arrangements that allow an employee to fulfil caring commitments there can still be problems. Cockburn has revealed how equality strategies that could improve the work/life balance can be contradictory and can in fact reinforce women's disadvantage in the workplace, by emphasising their different relationship to reproduction (Cockburn, 1991:12). To illustrate this, if women are offered shorter working hours as a way of employers recognising women's caring responsibilities, whilst this may facilitate this dual role, women become characterised as being less committed to their role as paid workers. In other words, *"you can't be equal and different"* (Cockburn, 1991:13).

The debate about whether women aim to be equal to or different from men has been central to feminist analysis and discussion and it continues to be relevant as women work out for themselves on an individual level which path to tread. The equality/difference issue cuts across a business world that is constructed to exclude the private and the feminine; specifically, should women deny sexual or biological difference and claim equal rights on the basis that they are the same as men? Alternatively, should women stress their 'feminine', caring qualities and seek recognition of these socially constructed attributes on a par with 'masculine' qualities so that they are equal to but different from men? Within the category of 'woman' there is a significant range of difference in terms of race, class and sexuality so this too informs the debate, leaving us with the question: which women will be equal to which men? Freedman (2001) summarises the various theoretical positions along the spectrum of the debate and suggests that one's position need not be fixed, and that the very complexity of the variables allows for a flexible response to particular issues. This flexible approach suggests that women may fight for substantive equality in all spheres, whilst at the same time recognising that it is women who do most of the caring and that this requires support.

As discussed earlier, the debate about which factors critically affect women's participation in the labour market has a dual focus on domestic explanations and labour market structures. This duality is not present when considering men's work patterns, as the conventional view has been that it is appropriate to focus solely on labour market structures or an uninterrupted career model to explain male participation rates (Langford et al, 1995). Factors such as parenting and caring are not expected to impact on men's work and therefore they do not need to be included in any analytical model. This factor is cited by Spencer and Podmore (1987) as preventing women assuming full professional identities. However, for women's work patterns to be understood, a life cycle approach has been thought to be more relevant in order that these factors can be incorporated. Walby's view, outlined above, is that too much emphasis has been placed on domestic explanations of women's labour force experience, obscuring the considerable impacts of a structured labour market that is dominated by men and discriminates against women (Walby, 1990:56).

Hakim (1991) argues that women's labour force participation is largely a consequence of women's choices, and that occupational segregation results from many women

choosing to give priority to their domestic work, rather than to their market work as part of a lifestyle preference. Hakim's emphasis on personal tastes and preferences obscures the reality of a highly segregated job market that significantly reduces the choice for most women of finding satisfying and reasonably paid employment. Crompton and Harris (1999) in discussing Hakim's rejection of structural factors as the main influence on women's labour market participation, argue that women do have choice but that this is always mediated by their lack of power relative to men and therefore is a constrained choice.

The issue of work/life balance is multi-faceted and operates on a number of different levels, incorporating qualitative and quantitative aspects. On a daily basis, for example, it operates in relation to hours spent in paid work and time spent undertaking domestic tasks and leisure activities. Taking a longer view, it affects choices and priorities over a life-time, with some workers feeling unable to take career breaks or take holidays or commit themselves to particular leisure pursuits or devote 'quality' time to their families. For many workers the issue of work/life balance is increasingly connected to caring responsibilities for older family members and the expectation persists that it will be women (and especially older women) who adapt work to accommodate these responsibilities. An implicit assumption of The Community Care Act 1990 is that some care previously undertaken in the formal sector will be transferred to the informal domestic setting and that there will be women available to provide this (Thompson, 2001:50). Stevenson (1994) found that women caring for adult dependants reported that one of the greatest difficulties they faced was sustaining their own employment, with a majority of women in her study deciding in the end that the demands of caring and paid work were irreconcilable. The psychological impact of juggling working and caring roles and 'fitting in' a whole range of 'duties' is often very stressful and sometimes overwhelming.

With the continuing shortage of skilled engineers in Britain, some attention has been focused on how to retain women who may want to take a career break. Because of the rate of change within the profession the duration of the break could prove critical. Daphne Jackson's study of the problems faced by women returners, particularly women returners who are well qualified in science and engineering, showed that among women in this group, the most common pattern seems to be a fairly complete career break from the birth of the first child until the youngest child enters primary school. In civil

engineering this could be regarded by employers as too long and these women, therefore, need access to retainer schemes to keep them in touch with the industry and with changes in their profession (Jackson, 1991:99). For women who take a long career break, retraining is essential and this is certainly so in the field of civil engineering, where technology changes are rapid and profoundly affect the way in which work is carried out. Jackson asserts that the more highly qualified the woman is, the more difficult it seems to be to return to work, though the paucity of highly trained civil engineers may in fact mitigate against this in future. Those who return and opt for part-time work may not be considered as truly committed to their careers and may be overlooked for promotion. Indeed, in civil engineering some employers are unwilling to consider part-time work for their professional staff. Part-time returners can thus experience difficulties because they are both part-time and mature and therefore do not fit neatly into the standard hierarchy (Jackson, 1991:102).

One of the most distinct types of gender segregation in Britain is that between part-time and full-time work, with the majority of part-time workers being women. The extent to which part-time work can be seen as an active choice (Hakim, 1991) to create a better balance between home and work is discussed later. Here it is relevant to record that part-time work is not just a feature of the service sector or manufacturing employment, but is now on offer in many professional areas such as social work, engineering, medicine and teaching. If part-time work contributes positively to the work/life balance, so too can flexible work arrangements both for full and part-time employees. Figures for 2001 show that this is now a popular way of working, with 20% of full-time workers and 23% of part-time workers adopting some type of flexible working arrangements. Broken down further, the figures also show that women were more likely than men to have a flexible working pattern (Social Trends, 2002). The extent to which part-time work for professionals is associated with a lesser commitment to career is difficult to evaluate. However, the reality of the concept of 'flexible working', which has come to mean part-time working for women and long hours for men, suggests that part-time professional workers (mainly women) may experience a loss of job status relative to that accorded to colleagues working full-time, even though their attitude to work is not any less committed.

6. Agents for change

In general, the concept of change in relation to gender at work within the construction professions has focused mainly on quantitative improvements focusing on strategies to increase the number of women in the construction professions. Figures for 2001 show that 1% of women in paid work are employed in construction (in a range of professional and non-professional roles) compared with 8% of men (Social Trends, 2002). Less attention has focused on qualitative improvements and it could be argued that until the qualitative experience of being a woman construction professional can be shown to be improving, then we are hardly likely to see significant increases in the numbers of women entering and staying in these occupations.

An emphasis of some of the structured initiatives, such as WISE, to attract more young women into engineering and technology has been on influencing educational choices relating to subjects taken for GCSE and 'A' level encouraging a stronger earlier focus on later occupational choice. The extent to which programmes such as WISE can act as an agent for change in fostering a greater awareness of engineering and scientific careers is not clear, though there is now more effort on the part of some schools to positively encourage girls to take up these male-dominated careers. Andersen (1998), in her work on career development and psychometric research, however, challenges the concept of 'choice' in occupational selection and particularly questions the role of education in this process. She stresses the influences of the whole socialisation process from early childhood which itself informs and moulds expectations about job possibilities long before any decision-making is needed. She discusses the significance of the implementation of the 'self-concept' in relation to work first proposed by Super (1953) and asks whether a real choice framework ever exists if it brings one into conflict with an already established identity. The key question here is whether this identity is at odds with the expectations of one's peer group and family and those in authoritative positions such as teachers and particularly parents. This then makes the choice one which is couched within a setting of opposition in a personal sense, and this may be a more significant barrier than those posed by the stereotypical expectations of wider society.

These considerations are set against a background of changing achievement patterns in education. The work of Debbie Epstein (1998), Ann Colley (1998) and Lorna Unwin (1998) points to the complex relationship between the attributed social roles of men and

women and the consequent gender related stereotypes of academic subjects. The choice of educational routes and patterns of study is influenced by a number of factors; key amongst these is the school environment and family background. This is born out by my findings.

Moving on to consider both qualitative change to construction industry practices as well as quantitative change in the increased representation of women in technical roles, the work of Greed (1998, 1999, 2000) provides a useful conceptual framework with which to discuss the extent and type of change that may be possible. An important theme of Greed's work has been the identification of possible change agents which she categorises into two main types: those operating as 'bottom-up' groups and those working as 'top-down' groups. These two categories could also be seen as change from the margins (bottom-up) and from the centre (top-down). Greed sees both these types of change agents as acting outside the mainstream construction industry, each with a different legitimacy or power base and each with a different potential for 'igniting' change. My classifications of 'margins' (minority groups that operate at a distance from positions of power) and 'centre' (existing influential positions such as those derived from government enquiries or commissions) seem helpful in conceptualising the potential origins of change. They also fit well with the 'bottom up' and 'top down' approach representing the pathways for change presented in Greed's analysis.

Challenges to the status quo coming from the bottom-up are characterised by Greed as initiatives undertaken by such groups as the Women's Design Service, the Society of Black Architects and London Women and the Manual Trades. These all operate outside the mainstream of construction and certainly beyond the 'perimeter walls' of civil engineering. (Greed's 'fortress' image of the world of construction is apposite).

Although small in number, these groups are important because of their high profile public campaigning and their symbolic power as grassroots activists promoting new models of practice for the industry. Initiatives for change from the centre, or the top, continue in the form of industry reviews. A range of examples can be cited: the 1994 Latham Report concerned with encouraging more women into construction, the government Foresight programme which covers not only construction but science and technology, the Construction Best Practice Programme, Investors in People and the 'Change the Face of Construction' programme. These projects are all aimed at modernisation of business practices to make construction attractive to prospective

entrants and also to aid retention of those already in. Greed also discusses the efforts of mainstream 'insider groups' (equal opportunities and educational groups), concluding that they act as a link between the central and marginal agents for change (Greed, 1999: 17), bringing about a 'fusion' of intent. The extent to which these 'insider groups' can act as drivers for change may depend on the business context, particularly in relation to public and private sector working.

Many organisations within the construction sector, including the majority of companies represented in this research, claim the label 'equal opportunities employer', implying that they have established policies to eradicate discrimination in employment. For those wishing to see more women joining the sector, equal opportunities seems to offer a way forward but the reality of the 'equality' experience may be limited.

Michielsens et al (2001), reporting on research into gender discrimination within the UK construction industry, make the distinction between the public and private sectors of the industry and suggest that equal opportunities policies have had different impacts in each sector. Their research looked at how a range of equality policies operates in practice and focused on tradeswomen employed in three local authority Direct Labour Organisations (DLOs) in London. Although under threat previously from Compulsory Competitive Tendering and currently from Best Value, these DLOs still comprise 25 per cent of all directly employed operatives in the industry (Michielsens et al, 2001: 122). The mechanisms within the public sector to promote the entry of more women into construction have largely concentrated on substantive and formal special encouragement measures, including information on entry relating to issues such as harassment and working alone, childcare, support groups and flexible working. These all comprise positive action measures and have been shown to produce limited success. Underpinning these initiatives is the concept of equal opportunities embodied within the anti-discrimination legislation such as the Sex Discrimination Acts 1975 and 1988 and the Equal Pay Acts 1970 and 1984. Michielsens et al make the point that the enforcement of this legislation has been weak generally and its implementation within the construction industry has been very variable in the public sector, and virtually non-existent within the private sector. If public sector employment within construction is either more possible or popular for women due to the sector's greater commitment to 'equality' policies this could explain the findings of earlier work carried out by Fielden et al (2000). Their research into the position of women within construction found that

proportionately women were over-represented in the public sector and grossly under-represented in the private sector. This has implications for civil engineering which is mainly a private sector business (see Chapter Two).

Michielsens and her colleagues found that it is the *way* in which equal opportunities policies are interpreted that can make the difference. An understanding, for example, that women do not begin from the same starting point as men, suggests that positive action programmes may be necessary to challenge the 'unseen' obstacles to women joining this highly male-dominated industry. Cockburn has considered this from an organisational perspective and has theorised organisational change resulting from the implementation of equal opportunities policies in terms of a short and long agenda (Cockburn, 1991:216). The short agenda takes a minimalist position in relation to recruitment measures aimed at minimising discriminatory practices, whilst the long agenda is focused on transformative change that extends beyond concerns with statutory compliance. The extent to which equal opportunities is likely to affect change within the industry is discussed in chapter eight in light of women's understanding of the ideas and principles that constitute this conceptual framework.

Other research suggests that women are discouraged from taking up professional careers within construction due to the sector's poor public image and to the attitude of employers about the suitability of women for construction work (Langford et al, 1995) and that these obstacles continue after they have joined (Watts, 1995). One response to this has been the use of mentoring and the development of informal networks which can be seen as 'bottom-up' strategies to support individual career development. Mentoring and coaching schemes are now widely used in construction both as part of an induction programme for new recruits and also in relation to on-going training programmes for new managers. Druker and White (1996) consider that these mechanisms are useful in providing information and advice on the cultural values of organisations but that they are unlikely to be the vehicle for changing subcultures. Despite this, they argue that personal mentoring is especially helpful to women and other minorities, aiding the negotiation of the 'unwritten rules' of organisational power which improves retention. This is consistent with other studies of women and mentoring (Evetts, 1996).

Research commissioned by the Chartered Institute of Building and the Department of the Environment and carried out by Court and Moralee (1995) is an example of an instrument for 'top down' change. The women taking part in the study were working in

a range of jobs including estimating, surveying, construction management, purchasing and building control. The combined use of quantitative and qualitative research methods enabled them to undertake a large-scale survey that considered issues similar to those addressed by my research and particularly to uncover the ways in which the industry must change to diversify and retain its workforce. The study's findings have informed the debate about ways of modernising construction practices.

The key issues of concern raised by the women in Court and Moralee's study were poor attitudes by employers to equal opportunities, the problems of site working and a lack of recognition by employers that flexible working can be advantageous, both for individuals and for the industry. These findings were set against a wider discussion of women's relation to the labour market, differences in behaviour of men and women within organisations and cultural attitudes towards management and authority. The study reported much ambivalence on the part of the women towards strategies aimed at recruiting women to construction and to policies that would further identify them as 'different' or a special group. This raises the question of whether it is the business that has to adapt to its changing staff profile, or whether it is the individual that just has to fit in with existing ways of working.

One of the key questions addressed by Court and Moralee was why women leave the building industry. Reasons reported ranged from wanting more secure employment, shorter working hours, poor pay and benefits, lack of training and development opportunities, experience of sexual harassment, preferring the company of more women and lack of job satisfaction. Six per cent of women leavers indicated that sexual harassment was an extremely important factor influencing their decision. The single most important influence, though, was the difficulty in finding work. Some of these factors are likely to affect men in the industry as well as women, but without comparable data on men, it is difficult to assess the degree to which different factors impact more strongly on women than they do on men. There is, therefore, scope for further research on the factors affecting both men's and women's decision to leave the industry, particularly in light of the current skills shortage and the expense of producing a skilled worker.

The individual experience of women construction workers in the US (Eisenberg, 1998) has been set against a background of 'top down' initiatives to generate quantitative improvements in the representation of women within the industry. Women comprise

roughly two per cent of the construction workforce, though the stated goal of the government was that women should make up one fifth of each apprenticeship class and an example would be set by establishing a clear timetable for the recruitment of women construction workers on federally funded projects. The fact that several women reported that a lot of companies just do not hire women indicates the extent of the problem. This mirrors the findings of Court and Moralee (1995) in relation to the recruitment culture within UK construction. When work was short women were often the first to be laid off, being seen as more expendable and their wage as less necessary than that for male workers. Underpinning this inequality was the deeply embedded workplace culture that characterised construction as 'men's work' so that only exceptional women could be admitted as part of the fraternity. In fact the myth of the exceptional woman construction worker reinforced the exclusion of women and despite affirmative action has prevented the establishment of a critical mass of women who could begin to transform this culture. Eisenberg summarises the US position thus:

'For women, the pioneering phase of breaking into union construction was not followed by a critical mass of settlers. Instead, pioneering, contrary to its meaning, became a seemingly permanent condition' (1998: 4).

Central to Eisenberg's analysis of the US situation is the concept of 'critical mass'. Debate about whether 'more means better', in terms of increased numbers of women within construction and engineering, has been a focus of other researchers (Greed, 1988 & 2001, Langford et al, 1995, Bagilhole et al, 1997b). The extent to which women have to adopt male behaviour to succeed within the industry underpins this discussion, with the inference being that they have to abandon attempts to change the culture to achieve success. Also it is open to debate how much 'more' is required, in a proportional sense, to have any real impact on changing the culture of construction, which Gale (1992) describes as having three principal features of crisis, conflict and masculinity. The concept of critical mass (the proportion of a minority that will enable change to occur) has been used to suggest that a proportion of around 35 per cent is needed to produce real or qualitative change. Langford et al (1995: 183) describe this change in terms of 'undoing' stereotyping with new role models emerging for women, so that *"the open resistance towards engineer-women in the labour market will disappear, women's professional decisions will be trusted, except by elderly people and female values will be accepted as appropriate and natural"*. Although this theory is as yet unproven the suggestion is clear: an increased presence of women in skilled professional roles may

not necessarily radically alter the qualitative experience for women in the industry, but it may act as an incentive for other women to join. Langford et al make the important point that gender values are not necessarily polarised but operate on a continuum. As a consequence, men and women with similar value systems could be expected to be attracted to similar occupations, thus explaining why 'more' may not necessarily be 'better' or even 'different' so that women who do move into management positions, for instance, may not automatically be expected to act as agents for change. This view is endorsed by Cockburn who found that many women do not seek transformative change within organisations and "*are as conventional in their view of hierarchy, bureaucracy and management as most of the men they join*" (Cockburn, 1991:71).

This brings us to consider the culture of management and how those who become managers are expected to have certain personal characteristics as well as a sense of 'ownership' of the organisations to which they belong. Gender is one factor or personal characteristic that seems to be significant, with 8% of women in employment occupying management positions compared to 18% of men (Social Trends, 2002).

7. The issue of management

There is now a developed literature on the gender relations of management and particularly senior management (Smith, 2000; Gerver and Hart, 1991; Davidson and Burke, 2000; Davidson and Cooper, 1992; Wajcman, 1998; Vinnicombe and Colwill, 1995). Evetts (1996: 119) makes the important point that in the context of science and engineering, definitions of 'manager' are critical because the blurring of organisational functions and line-management roles often makes it difficult to clearly identify where responsibilities lie. Reflecting more generally on women's progress within management, there is a suggestion that the contemporary world of equal opportunities has promised much but delivered little (Scott & Creighton, 1998). This may be due to policies being adopted but not implemented, so that women's career paths are still defined by the uninterrupted male career model, which itself is based on a strict separation between the public world of work and the private world of the family and personal relationships. Another aspect relates to the sense that many women feel that the battle for equality has been won and so interest in equality or feminist issues has waned, with the result that continuing inequality is a low profile issue (Sharpe, 1995). One of the participants made exactly this point and further suggested that because of a greater presence of women in engineering roles it is increasingly difficult to argue that

discrimination against women exists at all. Indeed this seemed to be the dominant view expressed within the study.

The previous chapter outlined how increasingly civil engineering companies now operate as large corporate entities, incorporating a broad range of skills and specialisms, both on the contracting and consulting side of the business. The role that management plays in delivering both projects and profits is now recognised as crucial particularly in a highly competitive environment. Moving into management is the goal of most engineers, as this is the principal route for career development and higher financial reward. If, as Handy (1985) contends, men are more concerned with the quantitative aspects of life and women more with qualitative considerations, then it follows that we are more likely to see men making career decisions based on income earning potential. This will inevitably lead them down the management path, resulting in what Kanter sees as the increased overlap between professional and managerial categories (Kanter, 1993: 301). Related to this is Hakim's argument that many women still choose to give priority to their 'family' work over their paid work and so may be less concerned to achieve managerial positions. Although women are still chronically underrepresented in senior executive positions, with men filling 98% of these posts (Guardian, 5 October 2002), the increase in women-headed households, alone, suggests that income earning potential may become an increasingly significant factor in influencing women's career paths. The question of who is selected for management (especially senior management) within civil engineering appears to be a gender issue based on the belief that managers are '*born not made*' (Langford et al, 1995: 137), with the implication that men lead and women follow.

Judy Wajcman (1998) has written extensively on the gender relations of management and her work influenced my decision to include some specific questions in the interview schedule about management styles, management as a career objective, and also questions exploring experiences of 'managing' and of 'being managed'. Her work has been closely linked to the issues of organisational change and the paradigm of corporate culture. She has suggested that the social construction of women as different from men is itself sufficient to maintain the hegemony of men at the top of the business tree. Her analysis has drawn heavily on the ways in which differences between the sexes have become highly gendered in terms of the polarised attributes that constitute the socially constructed categories of feminine and masculine. Within this model men are presented

as rational and women as emotional, men as objective and women as subjective, men organise hierarchically and women collectively, men are aggressive but women are gentle and more passive, nature is identified as female and the scientific mind as male, leaders are men aided by supportive women. These paradigms of gender association or sex role stereotyping impact on all aspects of life and extend into the workplace (Spencer & Podmore, 1987) to produce a specific set of cultural role expectations. Sex role stereotyping continues to be powerful in influencing who is considered suitable for certain types of work and the assumption that senior managers and executives will, in the main, be men is reinforced by the fact that they occupy the great majority of these positions (Marshall, 1984).

This broader picture of how management has generally been perceived as a male activity is brought into sharper focus when we look at management within the engineering and building sector. Management within construction has been likened to a military organisational model (Langford et al, 1995: 181) with a command and control structure underpinning the culture of management practice. According to Langford the principal behavioural characteristic of this managerial approach is being directive rather than consensual, so that an individual located lower down the hierarchy may experience little or no autonomy within their day to day work. The traditional view within construction has been that it is experience that develops managers with a corresponding lack of emphasis on structured management development programmes (Druker & White, 1996:133). Much of this is carried over into civil engineering operating as one of the construction professions. This expected style of management could be one of the reasons why women may feel less than comfortable 'managing' in this environment. Other reasons for this discomfort are connected to the cultural attitudes of construction workers. Druker and White (1996) have painted a picture of a potentially disaffected and independent (almost exclusively male) workforce on site that presents itself as resistant to being managed at all. This is partly due to a culture of mobility and self-employment that has become embedded within the industry over a long period (one fifth of all self-employed people work in the construction industry – Social Trends, 2002). Thus being a female manager in this environment is likely to be qualitatively very different from being a woman manager in other industries such as insurance, banking or the media, all service industries where women predominate (Pilcher, 1999:47).

The importance of culture, which is defined as “*the prevailing attitudes and beliefs within the organisation*” (Druker & White, 1996:153), has been thought to be particularly significant in influencing management style. Wider influences such as market sectors and different physical environments also impact on management approaches. Construction has been historically framed by a fiercely competitive business climate and managers that do not share these values are unlikely to succeed or progress further. Thus it is not management per se that poses difficulties but it is management within the particular cultural context of construction that seems to be problematic.

The discussion hitherto has centred on notions of ‘difference’ and, for women wanting to become senior managers, it has focused on the negative aspects of difficulties and barriers. Although in the literature the emphasis on obstacles is strong, there is an alternative position that there may be advantages to being a woman in modern business and there is some material to support this (Wilkinson & Howard, 1997; Smith & Bell, 2000). Some of the writing on this topic can be characterised as arguing that ‘the future is female’ suggesting a positive valuation of so-called ‘feminine’ styles of management which concentrate more on the strategy of persuasion rather than dicta to get things done.

With the large increase in management development programmes now on offer across a wide range of educational institutions (MBA courses being the most prestigious), we are seeing a new phenomenon: that of the mobile professional manager. Thus “*many young MBAs think of themselves not as members of particular industries but as professionals who can apply their skills to many industries*” (Kanter, 1993: 300). This new breed of highly skilled manager is not ‘company-bound’ and often moves from one organisation to another once the problem has been fixed, adopting the role of trouble-shooter. This may have implications for UK construction which has been dogged by claims of under-performance for many years. Murphy (1990) (cited by Evetts, 1996: 30), writing about the bureaucratisation of professionals, traces a now more common pattern whereby professionals are managed by managers trained in management schools, when formerly they were managed by peer professionals who could more readily identify with their cultural values. How, in the long term, the advent of the ‘super manager’ who comes without an engineering training will be received by the wider industry is uncertain but Evetts (1996: 30) notes that increasingly engineers and scientists find themselves in

competition with management specialists (often accountants) for some of the most senior posts. This is a consequence of the perception that engineers are there to solve technical problems first and manage budgets and business accounts second.

Responsibility for technical issues thus generally still remains with technical specialists, but it is corporate 'visionary' development and organisational goal-setting that is now often undertaken by this new breed of manager. Whether this generates a separate management subculture within the industry as part of wider moves to modernise business practices will be a focus for industry leaders and a challenge to those engineers who wish to use their technical abilities as the foundation for a career in management. A further consideration is whether this trend towards generic non-technical business management within the profession presents women with complications or opportunities.

8. Conclusion

Patriarchal structures in the workplace and within the family act to restrict women's progress within the paid labour force. Specifically, the expectation that it will be women who reproduce the family affects their perceived value to employers. Whilst capitalism can explain the class base for the oppression of both male and female workers as part of the process of profit maximisation, it is patriarchal structures as the defence of male privilege which can explain the gendered marginalisation of women within paid work. In particular, the ideological persistence of the male breadwinner model continues to influence the employment market and this is one explanation of the continuing gap in earnings between men and women. Opinions differ about why women are marginalised within employment. Both Walby and Cockburn place women's role within the family as a significant factor though their conclusions about its critical effect differ. Cockburn's research points to this as the primary cause, whilst Walby sees the vertical and horizontal segregation of the labour market, as the main cause of women's inferior status as paid workers, and their continued greater participation in domestic labour within the home. I find Cockburn's view more convincing, but whatever the dominant cause, labour market practices and women's domestic subordination can be seen as mutually reinforcing and this connection is summarised well in the comment below:

"It is clear that a narrow focus on work practices, or, indeed, the family or education system in isolation, do not account for the segregation described in a range of workplaces. Rather, the effects of patriarchal relations in a number of sites, reinforced by the state, confirm and reproduce women's restricted access to a labour market that is organised in a way that privileges both capital and men" (Rees, 1992:33).

Studies that have concentrated on the position of women within construction and engineering suggest the emergence of three key themes. The first focuses on the importance of identifying the various subcultures within different sectors and occupational groups within construction. These subcultures are complex and operate a range of formal and informal exclusionary practices to preserve the dominant cultural values of the group. Women thus continue to experience subtle patterns of exclusion and marginalisation in relation to the extent to which they can fit in to the dominant model. The extent to which 'management' can be seen as forming a generic subculture of its own within organisations has underpinned the discussion of the attributes associated with the 'person' of management and in particular the way in which this continues to be a highly gendered activity. The degree to which women are represented within the management of construction is therefore another key consideration and, despite changes in gender recruitment and careers, the link between masculinity, hierarchy and technology is still the dominant one for this sector.

The second theme is concerned with issues that affect work/life balance including the impacts on career progression of part-time working and the demands of caring responsibilities. This is developed in Chapter Seven. The third theme is concerned with the agents for change both from within the construction sector and outside it. This includes discussion of 'critical mass', in particular the debate about whether more women in construction will improve conditions for all, reduce conflictual ways of working and whether diversity in the staffing profile of the industry will facilitate a recognition that working conditions affect social and family life.

These themes highlight the complex nature of women's position in the workplace. The mechanisms of constraint that hold women back may not always be obvious, and more subtle patterns of exclusion that can be broadly defined as a form of sexual discrimination, can be identified. This study is concerned with how these constraints operate in practice both at an organisational and at a personal level. What obstacles do women meet along the pathway to success and how are women prevented from achieving their full potential in their careers? One aim of the study is therefore to investigate the extent and type of change that has occurred within the civil engineering profession to make it more accessible to women. This leads to a methodology of exploring in depth the experience of women already in the profession, identifying what they see as the most likely agents for change. This dictated a mainly qualitative

approach to the data collection to uncover the depth of information sought. In particular, I felt that this methodology would help to interpret an industry culture that I perceived to be strongly gendered but whose masculinity is seldom discussed. The next chapter discusses in detail the methodological considerations that underpinned this study and describes the research design, including an account of how priorities shifted as the study unfolded.

CHAPTER FOUR

METHODOLOGY

1. Introduction

The focus of the research was on understanding the changing position of women within the profession from the perspective of women themselves, particularly looking at factors that might impede their progress. A purely quantitative approach seemed unlikely to uncover the depth of knowledge and understanding I was seeking. Although, some attitudes or 'realities' can be measured by using a questionnaire or survey this approach positions the researcher as distant from that being researched and this did not seem appropriate in my case as I was closely involved with the industry (Cresswell, 1994). Quantitative methodologies emphasise systematic 'sampling' and controlling for bias claiming to produce 'value-free' knowledge. In contrast, my preference for a mainly qualitative approach was grounded in the value-laden nature of the study and was interpretative in style and process and centred on identifying experience and then attributing interpretation and meaning. Much qualitative research is informal because it is usually associated with personal accounts, particularly within the tradition of sociological research.

The review of the literature provided a broad theoretical framework that informed the development of the interview questions covering issues likely to be of concern to the interviewees. The review was drawn from a range of sources and was conducted in the early stages of the project in order to give an indication of the nature and extent of the problems being investigated as well as developing the concepts that provide the rationale for the study. These have all been discussed in the previous chapter.

This chapter discusses the general methodological concerns of the study focusing on both theoretical and practical issues and has four key sections. The first section considers the way in which the theoretical framework of the study underpinned the approach to the selection of the interviewees and the conduct of the interviews. This is linked to the second section which discusses the development of the interview schedule (the questions asked and the sequence of these) and the brief demographic questionnaire which was crucial in guiding the flow of the interviews. The detail of the interview process thus constitutes the third part of the chapter and deals with a number of practical issues that influenced the general conduct and atmosphere of the interviews. The last

section discusses the data analysis and includes reflection on the overall process of managing and organising what emerged as a large data set.

2. Theoretical perspective and participant selection

One aim of the research was to explore from a feminist perspective the barriers or obstacles that women face as professional civil engineers in a male-dominated profession. The concept of 'barriers' relates to the theoretical framework of the research outlined in the previous chapter, and was a key one in guiding which questions should be asked, and indeed was an underlying assumption of the research project itself. Janet Parr, in describing methodological considerations in relation to her research about mature women students, clearly illustrates that within the sociological research context this concept of 'barriers' takes on an almost inevitably subjective form, so that what the researcher perceives as a barrier may not necessarily be seen as such by those taking part in the study (Parr, 1998).

During a long period of association with the profession I have been able to observe the peripheral role that women seem to play in the industry particularly with so few in senior positions. My role has given me the opportunity to interact closely with some of the leading figures in the profession and this was instrumental in facilitating "access" to women in the industry as well as to their senior male colleagues. From the outset I was offered help and support with my research and practical encouragement in a variety of ways.

In considering how to conduct the research, I wanted to design data gathering techniques that would enable an in-depth view of women's experience and perspective of the profession. The aims of the research were to uncover how women saw their position in the industry, looking specifically at key issues such as professional progression, workplace culture, their role in management and the relationship between professional and non-work, or social, roles. I considered that a structured questionnaire or survey would not produce the depth of information I sought. A qualitative approach focusing on individual accounts almost as in-depth case studies, therefore, seemed to offer the best prospect of illuminating individual experience and achieving this objective. My intention was to create an informal interview situation that would encourage the women to speak openly of their views about their careers. Although I used a semi-structured interview schedule to guide the process I decided that this should not be too prescriptive because the primary objective was to give the interviewees as

much scope as possible to introduce their own ideas and concerns. This required flexibility on my part in order to allow the women to speak for themselves, in their own terms, about their experiences. The feminist theoretical perspective influenced the range of topics covered by the questions. It also influenced the language used in framing questions and the style of the interviews and suggested certain methods. However, the extent to which a distinct feminist research method can be identified has been the subject of debate (Stanley and Wise, 1992; Maynard and Purvis, 1994). The emphasis on qualitative techniques that characterise much research from a feminist perspective aimed at deriving in depth understanding and drawing out hidden issues now characterises much sociological research (Gilbert, 1993).

As part of the qualitative approach I wanted to develop a sense of mutuality between myself as the researcher and the women respondents. This approach had an impact on the extent of the preparation necessary to ensure that potential participants were properly informed about the nature of the study, and the type of involvement they were being asked to contribute. Although the contextual background of the research was explained to participants I decided not to give details about the analytical framework underpinning the study as I did not want to lead them in their responses. This issue forms part of the ethical framework of the research which clearly involves some measure of self-interest in my position as researcher (Ramazanoglu & Holland, 2002). I recognised that the interviewees might not share a feminist perspective and this led me to ask myself the question that Sandra Harding posed "*is there a feminist method?*" (Harding, 1997:160). Looking back on the experience, I think the answer to that question is 'yes' although many 'feminist' research principles are now seen more generally as good qualitative research practice incorporating a range of ethical considerations (Hammersley & Atkinson, 1995). An example of this is where the researcher has some form of commitment to those being studied and as a result seeks to establish a non-hierarchical relationship with them (Oakley, 1981). At the core of this approach is the sense that there may be some mutual benefit derived from the process by those 'giving' and those 'receiving' the information. Connected to this principle are the issues of harm and exploitation, specifically that those who are being studied are not disadvantaged or 'damaged' by the process and that the findings are not used against them (Flick, 1998: 60).

In relation to this issue of harm two particular interviews caused me to reflect on the ethical dilemma of the personal distress caused by raising certain issues and how this can be weighed against the potential benefit for women as a group from the research findings. As far as the issue of exploitation is concerned it was the interviewees who, almost without exception, mentioned that they expected to receive a summary of the key findings of the study in return for their contribution. These were already informed and empowered participants.

There is no single definition of what constitutes feminist research as feminists differ considerably in how they explain the world and what strategies they advocate. However, anyone who writes from a feminist perspective will be committed to a struggle to improve the condition of women. Academic writing and research from a feminist perspective can broadly be expected to question existing arrangements and their implications for women, insisting that women's voices are heard and their views accorded equal value. This approach also seeks to uncover patterns of exploitation and oppression in all areas of life recognising that women's views and experiences were for a long time left out of account. Thus, one definition of feminist research offered by Stanley and Wise (1990: 21) is research carried out by women who are feminist for other women with its central focus on women. The purpose of such research can be seen as political as it is committed to changing women's lives. These characteristics underpinned my research and strongly influenced the kind of questions raised in the interviews and also the manner in which these were asked. In other words, developing an open and inclusive but not an emotive or judgmental style was very important in encouraging the women to be free with their comments and accounts of their experiences. Integral to this was the careful use of language. This approach forms part of good research practice in general within the social sciences and does not relate only to the feminist model. As the fieldwork progressed, I concluded that my circumspect approach had been appropriate as many of the women showed little sympathy with feminist ideas or struggles but had been very forthcoming about their personal histories.

Understanding how women fitted within the overall structure of civil engineering required an appreciation of their proportional representation within the profession and other built environment professions. This led me to gather quantitative data concerning female membership of five professional institutes operating within the construction sector. This combined methodology of qualitative and quantitative methods could be

said to form a new 'orthodoxy' of sociological research in general and has come to be accepted as a legitimate form of feminist research methodology (Kelly et al, 1995). Thus the qualitative data arising from the interviews has been underpinned by quantitative data about the gender composition of the main building professions within the construction industry that is the context of civil engineering. More detailed quantitative data from the Institution of Civil Engineers outlines women's membership of the Institution across different grades and levels (see Chapter Two). This data showed that as women only make up 8 per cent of construction professionals and an even smaller proportion of civil engineers they constitute a minority group. Despite their marginalised position I felt that it was important to see women within the study as active agents, taking control of their own actions and creating for themselves satisfying professional and personal lives. With this in mind I resisted the temptation of positioning the women as 'victims' of a patriarchal profession. As feminist inspired research, giving priority to the voices of the less powerful and the marginalised seemed very appropriate.

From the quantitative membership data from the ICE it was clear that women are represented at all levels of the profession, from student member to companion and this influenced the composition of the set of women selected for the research. As a consequence I felt that it was appropriate to include women new to the industry as well as those who were well established, and some in very senior positions. I also wanted to combine this 'professional breadth' with a mix of women in different personal situations. Indeed, interest in women in a variety of personal circumstances within the profession was the foundation for some pilot research as part of a Master's dissertation, so this study was intended to build on earlier work where these factors had been identified as significant (Watts, 1995). I therefore already had some idea how important it was to include women in different personal locations, both in terms of their domestic arrangements and in terms of their career progress.

Questions about whom I should interview then seemed to cause me uncertainty. I was aware that white women working in London and the South East might have a different story to tell from an Asian woman in Yorkshire or Scotland, where attitudes to women in non traditional professions might be different. I considered whether it was important to represent the different sectors of the profession; focusing just on transportation, for example, might be too narrow. The issue of ethnicity was another consideration but I

was reminded that as mainly a qualitative study I was not taking a representative sample. Realistically it seemed that I might have to concentrate less on issues of ethnicity, geographic location and sectors of work and focus much more on the personal position of the women. This suggested that I included single women with no children, women with young children, women with partners and no children, older women whose children had grown up and also women with other types of caring responsibilities. My judgement was that it was these personal variables that might have most bearing on women's professional progression, rather than other factors that were not my primary concern.

I began the fieldwork eighteen months after the research study had commenced by which time a number of people across the industry had become aware of the project. I received messages and phone calls from people I knew in the business offering help either directly or by putting me in touch with women who might be interested to participate in the study. It soon became clear that if I was not careful the estimated number of twenty women for the project could quite easily escalate to several dozens. I therefore had to deal with offers of help sensitively to ensure that no offence was caused by deferring take-up on participation or declining it altogether. I was surprised by the level of interest shown in this research, not just from women but from most of the men who were aware of it.

Following discussions with senior representatives of five consulting firms with whom I had worked closely, I was given lists of their female engineers that included some brief biographical details for each woman. The women on the lists had all been told about my study by the senior male colleague who in effect had acted as my 'link' person, and they had agreed that I could approach them. I gave careful thought to which of the women I wanted to include, trying to combine factors such as age, partnered status, caring responsibilities and level of attainment within the profession. These selection criteria were linked to issues raised by the theoretical framework that focuses on patriarchal relations in the home and the workplace discussed in the previous chapter. This revealed how women's relationship to the labour market is influenced by their position within the domestic sphere. I therefore selected the first twelve women for the study, trying to ensure that they represented the mix of personal circumstances that I had identified as important. Subsequent interviewees were identified from several sources including articles in the NCE, contacts from within the ICE and suggestions from colleagues in

the business. I initially decided to interview twenty women but revised this as the schedule proceeded because I considered that this would not offer the breadth and diversity of perspective across the whole profession that I sought. The final number of interviewees totalled thirty-one engineers with the last one added some time after the others. I decided to include this last participant because I judged that her contribution might be particularly interesting and this indeed turned out to be the case. She had 'rebelled' by publicly speaking out against what she saw as the negative mainstream culture of the profession and I was keen to hear her story. In addition to the thirty-one engineers, I also interviewed the human resource manager of one of the largest consultants following an article in one of the industry journals about her organisation's initiatives to recruit and retain much needed technical staff. I was interested to uncover how they had achieved significant reductions in staff turnover.

Chapter Five begins with a more detailed description of the participant profile but it is helpful here to give a brief summary. Thirty-one women were interviewed ranging in age from twenty three to fifty six years. One of the research questions is concerned with how the profession has changed so it was relevant to include women whose career spanned a long period. The majority was either married or with a partner and in every case, the partner was also in a professional occupation. Eleven women had partners who are also civil or structural engineers. Thirteen had school age children and of these, eight worked full-time and five part-time. The issue of women combining professional careers with motherhood emerged as a key theme in the literature and so I felt that it was important to include women in this situation both as full-time and part-time workers. Most were working in London or the South East but several of the companies supporting the study had regional offices throughout the UK and this enabled me to include women from Belfast, York, Chester, Bath and Oxfordshire.

Directly related to the number of interviewees was the gross underestimation of time I had allowed in my research timetable for the fieldwork. I had allocated only four months to complete all the interviews; this in fact turned out to be nearer nine months and was very intensive and time consuming for a number of reasons. Often I would have to travel for two to three hours to the place of the interview and then once there, following introductions and initial discussion the interview itself would take usually from one to one and a half hours. As soon after the interview as possible, whilst the exchange was still fresh in my mind, I would complete the transcription. I found that on

average this process would take six to eight hours per transcript. The time variation depended mainly on the clarity of the tape and on whether I wanted to include any notes that I had made during the interview. Some interviews were certainly more enjoyable than others, but overall this was a very rewarding part of the research.

One practical issue concerns the distant location of some of the interviews which meant that I had to stay away overnight as I could not accomplish the interview(s) just over one day. This had to be planned carefully to fit in with the respondent's availability, my professional work and childcare arrangements. A major contributory factor to the success of this process is the fact that I had a great deal of flexibility in the way I managed the delivery of my paid work. I felt that this was instrumental to the smooth pattern of the fieldwork, specifically because it enabled me to be responsive to the changes in availability of some of the participants.

3. Developing the interview schedule

There was an implicit gendered dimension to much of what the women had to say about their career expectations and to the nature of their experiences at work. This could in part be explained as a response to the research statement that had been circulated to all contributors with the letter inviting them to take part in the study. This set out the main objectives of the research and some of the key issues that I regarded as important in affecting women's career development in the profession (see Appendix II). The theoretical framework of the study informed the types of questions I asked in both the 'Participant Details' information sheet (see Appendix III) and in the interviews (see Appendix IV).

One of the problems with placing the concept of patriarchal structures at the heart of the research was that I did not want the women's accounts of their experiences to position them simply as victims of systemic oppression with no agency as raised earlier.

However, as the interviews unfolded, it became evident that in general the women were carving out for themselves careers in the mould they wanted. This was the basis of their agency and the fact that for some, their ambitions, expectations and career goals were not the same as those of their male colleagues, or indeed did not match my own preconceived notions, was a separate issue.

Earlier I explained that this research started as an exploration of the barriers or obstacles that women face in the profession. But as the research proceeded I started to question

the validity of the theoretical framework within which I had chosen to operate, mainly because what I had described as 'barriers' or 'obstacles' were not necessarily seen as such by the women I was talking to. Although, clearly a researcher's theoretical perspective does not have to be shared by participants, the interview process may be more comfortable for the researcher if it is. Some of the views expressed in the interviews were clearly of a feminist nature but were not attributed as such by the women some of whom, I felt, would be less than comfortable with that labelling of their perspective. So although participants generally seemed to reject the feminist label they did not necessarily reject feminist ideas.

The concept of 'barriers' did not figure strongly in the women's accounts and I had to ask the question to what extent can a barrier be said to exist for a woman if she does not perceive it as such. Some of the accounts, in part at least, seemed to identify a more general but less explicit form of resistance to women in the profession. Such resistance was less overt than a direct barrier, rather more of a constraint and was expressed in the subcultures of the workplace and the male-dominated environment that was perceived as the 'proper context' of civil engineering. This relates to the way that patriarchal structures create a legitimisation of the gendered relations of power. Uncovering these hidden meanings and subtle inferences required a particular technique of careful questioning and circumspect use of language which also aimed to avoid leading the women in their responses.

Beth Martin's (1998) explanation of the factors that marginalise women within science was particularly helpful in informing my understanding of the subtle exclusion mechanisms that keep women on the periphery of civil engineering. Her critique takes as its starting point the social assumptions about who scientists are and then moves on to consider the cultural expectations that position men and women differently. She argues that women (and men too) are seen in terms of their cultural capital, which is defined by socially pre-given characteristics assigned along gender lines. Such attributes constitute binary opposites such as thought versus feeling, objectivity versus subjectivity and knowledge versus instinct. This gave me some insight into why the theme occurs again and again in the women's stories of 'having to prove myself' and having to 'work harder' to gain recognition on equal terms with male colleagues, this acting as a major constraint on their progress. Such demands act as barriers even if women do not perceive them in this way. As Pattatucci puts it "*standards for*

proficiency are typically constructed out of a male model. Women are compared up to men; the scope is structured such that we always fall short of the mark" (Pattatucci, 1998:47).

However, as the fieldwork progressed I increasingly felt that the concept of 'barriers' might not quite characterise their stories. Instead, the notion of boundaries or limits began to emerge and with this the sometimes contradictory sources of the cause, with some women setting the limits for themselves and others feeling that it is the male culture of the business that establishes the line beyond which they cannot go. However, in general there did not seem to be a ready acknowledgement of the pervasive effect of gender on their career patterns, their professional and, in one or two cases, their managerial lives and their private experience. As I considered this more closely I recognised its synergy with the patriarchy model and in particular the paternalistic culture within civil engineering. Men have traditionally held social power and therefore set the standards and rules within society; this is so in the workplace too. The fact that men control the industry as well as broader social and political structures, creates an asymmetry of opportunity in which men are able to take full advantage of the total available resources while simultaneously erecting boundaries that severely impede the progress of women. Because these 'boundaries' or 'limits' are not verbalised and because almost all the companies represented in the study have adopted formal equal opportunities policies, the issue of why so few women make it to the top, or anywhere near the top, is not taken seriously. It is thus seen as sufficient for those in authority to state that no boundaries in fact exist, and the subject is closed.

Following the two pilot interviews, it became clear to me that I would need to focus on the more diffuse aspects of the problem, things that a majority of professional women face to some degree, which tend to eat slowly away at one's self confidence. They are usually hidden and less easy to name. I therefore needed to explore what these boundaries to success are but also to what extent women set their own limits on success and even ways in which some women challenge the concept of professional achievement as only defined by an individual's place within a hierarchy. This was highly relevant as the management and board structures within the engineering consultants all indicate that, despite more women coming into the profession, there are limits beyond which they cannot go. As in so many other fields, women in engineering hit either the '*mummy track*' (Pattatucci, 1998:7) or a glass ceiling.

4. The interview process

Glucksmann (1994) has written about the inequalities of knowledge in the research situation and this led me to provide participants with details about the objectives of the research well before the interview. However, I decided not to outline the theoretical framework of the study because I considered that this might deter some women from taking part. As a result a fully 'open' approach was compromised. Devine and Heath (1999) note that such compromise is a common feature of much sociological research. Allied to this of course is the question of just whom the research is for and what is to be done with the knowledge produced. The tenets of feminist research as described by Glucksmann (1994) include a commitment on the part of the researcher to ensuring that the knowledge produced by the research is directed at changing the inequitable power relations between men and women. In other words, a fundamental feature of feminist research is the political application of the output. This, I realised is the main consideration and although important on a personal level, establishing openness between the researcher and the researched, is in fact secondary to the obligation to use the findings more widely to benefit women. Thus, making a difference to the working lives of women civil engineers is a goal of this research, but stating this in explicit 'political' terms to the participants may have been instrumental in their choosing not to participate in what could be seen as an exercise that could threaten their status or security. The fact that the issue of confidentiality was raised throughout the interviews illustrates the point.

Lather (1995:294) describes feminist research as putting "*the social construction of gender at the centre of one's inquiry*". This is exactly what I tried to do when putting together the interview questions, so that the centrality of gender in the shaping of human experience and social institutions was a clear theme of the dialogue. To what degree the women gained any understanding of the relationship between social structure and individual experience as a result of the interview cannot be known though several women were interested in whether I had been able to trace any common themes in the accounts.

There are many different types of interviews that can be used for collecting data. They range from the completely unstructured to the more formalised approach. The unstructured interview tends to be informal, open-ended and the shape determined by individual responses. On the other hand the highly formal interview may be tightly

structured with a set of questions that dictate the content of the interview. Bell (1999: 138) argues that most interviews fall somewhere between the completely structured and the completely unstructured giving some freedom to enable interviewees to talk about issues that they consider to be of particular significance. The semi-structured interview lies somewhere in the centre of this continuum and I felt that this type of loosely structured questioning would offer the best possibility of encouraging respondents through careful probing to explore more thoroughly their own experiences describing these in their own words and in their own time. Wengraf (2001:3) supports this in his description of the depth interview:

“It has to be planned and prepared for like other forms of research activity but what is planned is deliberately half-scripted...its questions only partially prepared in advance (semi-structured) and will therefore be largely improvised...the interview as a whole is a joint production...by you and your interviewee”.

The interview process was thus underpinned by the aim of getting participants to talk freely and openly about themselves with only initial stimuli provided by open-ended questions (Powney & Watts, 1987). Achieving this openness, however, involved more than just the interview itself. There were several stages of contact both before and after the interview. Initially I made telephone contact with the women primarily to introduce myself and the background to my research. If they were agreeable I then followed this up by writing to them with more information about the study (Appendix II), requesting their involvement. A week or two later I telephoned again to discuss their participation and agree a time and place for the interview. After this telephone call I forwarded a simple demographic questionnaire requesting some personal information and basic career details (Appendix III). I asked that this would be given to me when we met for the interview. The information supplied was important in guiding the interview.

I decided that my first two interviews would be with women I knew: the first I knew well and the second only slightly. This was a useful strategy, as it allowed me the space to experiment a little with interviewing techniques within a more 'familiar' and friendly setting and build some confidence. In both cases, I explained that I was at the very beginning of my fieldwork; this was received well and in one case I was offered reassurance. These two were pilot interviews but I have incorporated their contribution as part of the main data set because of the richness of their accounts and also because the interview schedule was hardly altered following these two interviews. For the interviews with women I had never met before and whose background was only

presented to me as detailed on the demographic questionnaire, I was keen to develop some overall sense of the person; their manner in dealing with others; sense of humour and even their social interests. In this context watching the body language was important. The amount people smile can convey a lot. For some answering the questions seemed a slower process than for others; hesitations were sometimes significant but not always. For some this was indicative of the careful use of language and on several occasions I was given the impression that the women did not wish to appear too judgmental of their peers or of the 'system' which they had chosen to join. One respondent explained that she did not want to criticise an organisation (the ICE) to which she had contributed nothing and expected little from. That was interesting because it raised the concept that it is the notion of owning or being part of a project or an organisation that confers the right of legitimate criticism. There were times when I felt less than confident that when analysing the data I would be able to do justice to the women and stay faithful to their stories. By this I mean not just recording substance but also including the spirit of what they had to tell me. Even at an early stage of looking at the transcripts, it was evident that I would have to develop the analytical skill of clear layers of interpretation to create useful knowledge that can be used as Kelly et al (1994:28) describe to "*make a difference*" to women's lives.

The demographic and career information provided by the interviewees formed an essential tool in the interview process, as this gave me a good sense of their personal and professional background. The greater part of the interviews took the form of open-ended questions in which interviewees were asked to describe and reflect on their own experience. In all cases the women agreed that the interview could be taped. This was particularly helpful as it obviated the need for detailed note taking. (On one occasion I tried taking full notes but found it difficult to concentrate on what the woman was saying whilst at the same time trying to write coherent comments.) The act of writing whilst someone is talking to you seems to disrupt the interaction. Specifically, I did not want to appear as though I was distracted and not fully concentrating on what they were telling me; I found that lots of eye contact was important in establishing a good rapport. I felt that there would inevitably be the need to cover some potentially difficult and sensitive issues, and that naming certain types of behaviour might prove challenging for the women. Even so, because of the theoretical framework I had chosen I felt that it was necessary to raise these issues, choosing my words carefully and ensuring an 'active'

listening style during the interview. It was clear at a fairly early stage that, for these women, looking at the profession from the perspective of their own experiences was a new enterprise. Several women expressed surprise at what they told me, mainly because much of what they had to say, it seemed, had been formed during the interview itself or ideas about their experiences had only been considered prior to the interview, prompted by receipt of the research statement.

I had prepared some interview questions which covered issues I wanted to explore relating to the themes and theoretical framework discussed in the previous chapter (see Appendix IV). In this sense, the interviews were semi-structured but in framing questions, I had to ensure that they were as open as possible, so that the women were not too led in their replies. I soon discovered that it is easy to pre-determine outcomes and that the way you phrase a question, placing emphasis on some words rather than others can influence responses. For example, when discussing the issue of site work with Naomi Gill, a young engineer working for a consultant, she was clear that her brief time on site had been trouble-free. She said she had enjoyed both the work itself and the challenge of the setting. However, when I questioned her in more detail about particular aspects of the culture of construction sites, mainly behavioural issues, she seemed to be searching for instances that would give me the response she felt I was seeking.

I had developed the interview prompts over a period of several weeks, to take account of content, style and sequence. Asking questions of the women at similar stages of each interview I thought would be helpful in establishing a sense of introduction, substance and some kind of conclusion or looking forward. The detailed preparation, with much refining of both the questions and sequence proved beneficial because all the women referred to the fact that I had covered all the areas they wanted to discuss. In that sense, the interviews were comprehensive and well received.

The women I interviewed at their places of work were given working time as opposed to their "own" time or "lunch" time to take part in the interviews. With only one exception, an office or company meeting room was made available, and usually I was offered refreshments on arrival as I prepared my tape recorder etc. The atmosphere then around "doing" the research was one of co-operation and a spirit of making me feel welcome was clearly evident. Within this environment I felt comfortable with the process, particularly as I had made it clear originally to the senior company engineers (all male) who had acted as facilitators that the interviews would be entirely

confidential. This then having been established enabled me to proceed, confident that my independence and that of the women taking part in the study was not being compromised. Surprisingly in the cases of the two women I interviewed in their own homes, the atmosphere of the interview seemed hardly different and the interview proceeded in a similarly purposeful way. Despite this relatively smooth passage, I remained throughout the process in a quandary about how to arrive at any authoritative conclusions about the stories of these women's working lives and the broader trends and themes arising from them. This ongoing problem is recounted by other researchers, notably Holland and Ramazanoglu (1994), in their work researching young women's sexuality.

The interviews themselves were relaxed and friendly with an air of informality. The tapes show that during some interviews there was much laughter and banter as we shared either a common experience or a particular view on some aspect in a light hearted way. In all cases, I began the interviews by assuring the women of the confidentiality of what they would tell me and expressed gratitude for the time they were giving. As the interviews progressed, and some ease of exchange had developed, they talked of much more personal issues such as confidence and status, having a family, personal development both in their public and private lives and for some of making great changes for the future. All this was given and shared openly and willingly and for some was obviously difficult on a personal level. On more than one occasion a statement was prefaced by "I probably shouldn't be telling you this" and I tried to ensure that the interviewees felt assured that their comments would be treated in strict confidence. For one woman, having to admit that she had spent the last fourteen years in completely the wrong profession, may not have been a very easy disclosure. I was made aware that the research process can make people confront difficult issues, such as sexual harassment for example, which then may raise ethical issues for me as a researcher, leaving people troubled or disturbed. The naming or labelling of certain types of behaviour can alter their meaning and significance and I was made aware of this on several occasions.

I was surprised by just how quickly the 'distance' between me as the researcher and the women as the researched was broken down during what I came to regard as a guided conversation. I have reflected on this subsequently and in light of Mishler's view of interviewing as simply a " discourse between speakers" (Mishler, 1986:36), wondered

whether this could be attributed to the perception of a relatively equal power relationship within the research situation. By definition all the women I interviewed were well educated and, in terms of their working profile at least, were middle class. The fact that I was there to interview them as part of my doctoral research, and also that I have been associated with the profession for some time, provided possibly a sense of 'equality' of status and interest despite our different involvement. The fact that although not a civil engineer myself, I have a wide understanding of how the profession operates and know several of the key figures within it, undoubtedly gave me some credibility in the women's eyes, and in a way legitimated what I was doing. In that sense I approached them as an 'insider' rather than an 'interloper'. I feel that this was instrumental in providing an easier access and a smoother pathway for the process overall.

The need generally to ensure confidentiality and anonymity for the interviewees was paramount, especially as some of the responses contained comment that was critical of specific employers or individuals. Such material could seriously damage the career advancement for the women involved. Of particular concern was the need to protect the identity of several women who are leading figures within the profession. It was thus necessary to edit career and work history details and to change the names of all the women. To complete the confidentiality process, following their transcription, all the tapes were destroyed.

Good research interview outcomes as defined by an interviewer are responses that relate to the research questions. I found that sometimes I had to develop subtle ways of steering the women so that most of the topics that I was interested in were covered. Having the opportunity between interviews to go back over the tapes to reflect on the way questions have been asked or responses validated can be instrumental in affecting how future interviews are handled. Refinements to my schedule resulting from this reflective practice were small because the data generated covered the key issues in great depth. An essential feature of effective interviewing, I discovered, was to listen well and when necessary to 'hold' the silence. During two interviews that took place towards the end of the fieldwork, this skill proved invaluable and allowed the women to recover their composure following discussion of some very sensitive issues.

Overall, this kind of reflective approach to the process allowed me to consider and reconsider the questions I was posing, and crucially the assumptions behind them. Because of the assumptions underpinning my research strategy, it is obviously not

possible for me to claim the status of neutral detached observer or investigator. I bring to the inquiry a particular theoretical standpoint together with a whole set of preconceived ideas based on observation, quantitative sources and much anecdotal evidence. In this respect, my position within the research is inevitably a subjective one; that is how I have arrived at my original hypotheses that have framed the research questions. As far as the interviews were concerned though, I tried to concentrate on being as open ended and non-leading as possible. The temptation to 'put words in their mouths' was occasionally strong and this became clear when playing back some of the tapes during the transcription process. I tried to keep this in my head for the next time. Too many strongly solicited, biased or weighted responses will affect the authenticity of the data. The data, as far as possible, should be the women's accounts and not accounts embellished or 'nurtured' by one's own leading. I can now appreciate why producing sociological knowledge for the public domain, within an academic theoretical framework, from the personal, private stories of others, is inevitably a highly subjective process.

One characteristic of the process is its immediacy. There was only one opportunity to meet each participant so on a practical level it was important to ensure that the tape recorder was working properly and that I had come fully prepared. In concluding the interviews, I wanted to leave an impression that the women could keep in touch with the project. Thus in writing to each participant to thank them for their time and contribution, I also invited them to maintain contact with me either to follow the progress of the study as a whole or, if they wished on reflection, to add anything to their stories. In one case this proved helpful as I received some additional comment following experience on a particular job.

5. Data analysis

The most daunting aspect of the very practical and detailed task of analysing the qualitative data was the sheer size of the data collected which amounted to many files of correspondence, demographic data sheets, field notes and interview transcriptions. I was not prepared for the vast amount of paperwork that the research process had generated and making sense in a structured way of the information led me to consider a range of methods for organising the material which fell broadly into two types; manual methods and computerised techniques. My starting point was to contextualise the qualitative material against a quantitative analysis of the data set. I undertook this using a

spreadsheet to develop a breakdown of who these women were in terms of age, domestic circumstances, sectors of work and professional progression. This is summarised in the next chapter and, although time consuming, this was a more straightforward process than the coding of the interview narratives.

The physical process of sorting the qualitative information can be carried out in a number of ways; Merriam (1988) lists computer software, file indexing and file cards as possible methods. I decided against the use of computer software to support this process and concentrated on using a mix of colour coding and file indexing and felt more comfortable with a manual approach to this part of the data analysis. Before I could begin to start the coding I returned to the themes that the literature review had suggested as key to the research, namely subculture, work/life balance and agents for change and set out a range of issues and concerns that could loosely fall into these categories. This process of classification of topics proved to be problematic. For example, I asked each woman if they had experienced sexual harassment at work and their comments were coded as a 'subculture' topic. However, in some accounts, this issue was also the focus of change, (improvements in policies within some of the contracting firms in connection with the display of pornographic material) and so had to have a dual coding. The range of concerns that seemed appropriate to the work/life balance category was extremely varied and included part-time versus full-time working, parenting, flexible working, career breaks, long hours culture and 'presenteeism', management and site work. However, several of these issues were clearly connected to the subculture of the industry as well, so several strands of interpretation evolved to determine where best to allocate sections of data. This illustrates that there are strong interrelationships between the categories so separating them into neat divisions was not always possible. Furthermore within the three categories there were major and minor themes and also what I could best describe as 'contrary' or unique views within each. A method of identifying these had to form part of the coding process as well so that I could later judge whether to discuss these in the findings or discard them.

Coding the data and determining where to 'place' particular incidents was thus a very complex process and seemed to be entangled with detail of language and emphasis and, above all, was a function of assigning meaning. Arksey and Knight (1999) argue that the researcher affects the meaning read into the data and that this is more pronounced with the interpretation of open-ended questions than with closed ones. Searching for

patterns of meaning by comparing incidents in different accounts, as a way of building explanations, was further complicated by the uniqueness of individual settings and contexts. Underpinning this activity was the awareness of the overarching three categories to enable a sifting of the data with a view to reducing it to manageable proportions. Although this was a lengthy process, it was eased to some extent by the fact that nearly all the interviews followed a similar pattern in terms of the sequence in which topics were discussed. This also allowed for easier cross-referencing and enabled the material to be moved around in a manner consistent with the principal themes identified. No new themes emerged and the data emphasised the women's concerns particularly about the conflictual and exclusionary subcultures within civil engineering and the problems they experienced achieving work/life balance.

Although the accounts varied in content and style, there was some commonality in the language used to describe how the industry is structured and how the women saw their place within it. Again, this made it easier for me to navigate through some of the layers of meaning relating to job functions and corporate roles, so that I could arrive at a better understanding of what the women did in their daily work and how this compared with others in the study. However, there was considerable variation in the way the women communicated problems they had experienced in their careers, particularly those connected to harassment and bullying and how they identified discrimination. The variation was in relation to language, where the use of different terms and expressions conveyed different meanings, which in turn made the comparison of accounts more problematic. This is where the subjective stance of the researcher in interpreting statements and inferences clearly affects the knowledge produced by the research.

Because analysing qualitative narrative data is so highly dependent on the interpretation or meaning attributed by the researcher I was concerned to verify the classifications I had made. This involved me going back over each transcription on a 'second run through' to see whether, as a result of the detailed 'unpacking' of all the accounts, any anomalies could be uncovered or whether it was appropriate to re-classify any of the material. Cresswell (1994) suggests the requirement of researchers analysing a qualitative data set to develop categories making comparisons and contrasts but also to be open to the possibility of contrary explanations for findings. This analysis process did throw up some inconsistencies and caused me to undertake a further review of the data that resulted in a regrouping of issues within and between the three main

categories. Subjective perception of meaningful patterns is clearly a process of refinement and I was made very aware of how problematic interpretation is particularly in light of the temptation to be over simplistic in organising the material. To illustrate the point, in my initial classification the topic of equal opportunities fitted reasonably within all three categories. However, on closer examination of the interview texts, it seemed from the general understanding of the issue on the part of the women, that this topic was hardly relevant to their experience and I was very uncertain of where to place this evidence within the findings. A small minority of women, though, voiced quite a different perspective in such a powerful way that led me to decide that this was an important area within the research and one that could best be developed within the category of industry change.

Analysing the data was a combination of deconstructing what the women actually said and assigning meaning and significance to their terminology. I referred to the brief field notes made both during and after the interview as part of this process. The reality spoken of by the women about their work and personal lives cannot go unmediated by the multiple ways of understanding or interpreting the texts. Deriving conclusions from such complex layers of information thus presented me with considerable challenges. This led to a detailed checking and cross-referencing of material and I have learned how important this is in ensuring that themes are accurately identified and evaluated. Although there were some common patterns across experiences (such as the sense of isolation for instance) there were also shades of difference and degree. Thus when some findings, which at first appeared to be universal, were examined more closely, they revealed nuances of difference that could not be readily explained. Being clear about how factors such as the age and personal circumstances of the women might account for these differences turned out to be very challenging. The frustration with an industry culture that does not have the same performance expectations of men and women was voiced more strongly by the older women, some of whom had been pioneers and had become leading figures within the profession.

Analysing data in the light of the original research objectives can make this part of the research process a lot more focused and streamlined. However, in my case I was not testing a specific hypothesis but rather was trying to build a knowledge base about what it is like being a woman civil engineer in Britain today based around particular themes. As the process progressed I became increasingly aware of the contradictory character of

women's experience and identities (Hollway, 1989). A number of specific interview questions were used to enable the 'telling' but with a semi-structured format, the women could say as much or as little as they liked across a wide range of issues. This made getting a feel for what could be described as key findings difficult and made the data susceptible to manipulation to conform to an identified pattern or trend. It thus becomes all too easy to read meaning and emphasis into statements that would not reflect the sentiments intended by the interviewee.

6. Conclusion

Overall I was struck particularly by just how 'individual' all experience is, even when comparing, for example, the experience of women who had spent most of their professional lives working within the same organisation. In this respect the qualitative approach I had chosen enabled me to make the interviews responsive to the individual, whilst still retaining the original framework and sequence of the generic interview schedule. A quantitative approach would not have had this flexibility and, more importantly, could not have revealed the nature of the relationships and processes at the heart of the accounts. Cockburn (1991:2) makes a similar point in relation to her research into organisational change. The depth of experience revealed in the accounts was partly due to the informality of the process. Unlike Holland and Ramazanoglu (1994: 127), I would not go as far as describing the interviews as social events though they were inevitably socially constructed. In trying to explain why so many of the women (most of whom I had not met prior to the research interview) were so open about their professional lives and eager to contribute, I was struck by the sense that this represented an opportunity for many of them to question themselves about their careers and evaluate their progress.

This feature of my research experience is mirrored in Parr's qualitative research about why mature women return to education (Parr, 2000). I recognised, both at the time and subsequently when analysing the data, that for some women this process had been difficult and in the case of Susan Hamilton and Helen Coates, rather traumatic. Reflecting on this, now that some time has passed since the interviews were completed, I am more aware how important it is to ensure 'safety' in the emotional sense for both the researcher and interviewee. I managed this by explaining that being quiet for a few minutes was acceptable, allowing us both to regain composure and then checking that it

was fine to continue with the interview. This is a significant lesson that will inform any future research I undertake.

Finally, a question I continually posed, as the data analysis progressed, was the extent to which one could generalise from the findings. Clearly a small-scale study such as this using a qualitative sample of only thirty-one women cannot be treated as representative of the experience of all women civil engineers. Nevertheless, sensitively conducted research, where the researcher builds a relationship with those being researched and allows them to speak in their own words and to reflect, can offer considerable insight into the significance of individual experience to shed light on the way in which the profession operates and some of the problems that women are likely to encounter. I was, thus, drawn back to the basis of any qualitative research that takes its authority or validity, not from numbers or samples, but rather from the profoundness of the information made available.

Ramazanoglu and Holland (2002) argue that uncertainty about the nature of social reality lies at the heart of all methodologies of social research, particularly knowledge produced from individual biographies. The very nature of personal accounts and the way that these are conceptualised and interpreted cannot be tested against a set of general rules and in this respect we can never be sure that we have got it absolutely right. Thus, the issue of validating findings drawn from qualitative data must rest within the project itself. Being transparent and open about values, bias, working and re-working of method and about the location of oneself, as researcher, within the research process frames the validity of the knowledge created. An awareness of all these issues of 'interpretation' and 'synthesis' has informed the data analysis throughout and has helped me avoid the more obvious pitfalls (for example, just taking statements at their face value) simply by being aware of them. The research findings that emerged from the data analysis are outlined in Chapters Six, Seven and Eight. These have been organised around three central themes broadly reflecting the main issues drawn from the literature review. As an introduction to these, Chapter Five gives a breakdown of the participant profile beginning with a general summary followed by more detailed individual biographical accounts.

CHAPTER FIVE

PARTICIPANT PROFILE

1. Introduction

Methodological considerations discussed in the previous chapter concluded with a summary of the main issues connected with analysing the qualitative data set. Issues of language and interpretation were shown to be central to this part of the analysis process and were instrumental in drawing out and evaluating the findings. Managing the large volume of material collected, in order to reduce it, was essentially a 'filtering out' process.

Discussion of these practical procedures relates to concerns about authenticity and validity of the findings though this is not intended to form the basis of claims of generalisability. The findings build patterns of explanations of unique accounts and events and add to the existing body of knowledge about women working as construction professionals. The individual accounts are case studies in their own right and, in that sense, are unique stories that deserve to be represented as accurately as possible. However, they also have some collective identity because of the similar types of experience recounted and the common themes that are evident. This chapter discusses the participant profile in considerable detail by first summarising the data set as a whole to give a sense of the range of experience present. This is followed by individual summaries of the women's personal circumstances and current professional roles. This chapter is thus designed as an introduction to the next three chapters which discuss the main findings of the research and is intended to give the reader a sense of the data set both as a whole and as individual case studies of experience.

2. General summary of the participant profile

To establish the context of the later chapters that discuss the findings of the research it is necessary to situate the participants in terms of personal circumstances and professional background. A general summary of the interviewees follows to establish an overall picture of the group. The second part concentrates on the individual biographies of participants including details of personal circumstances and career history. An overview of the characteristics of the data set used in the study is shown in figures 1-4.

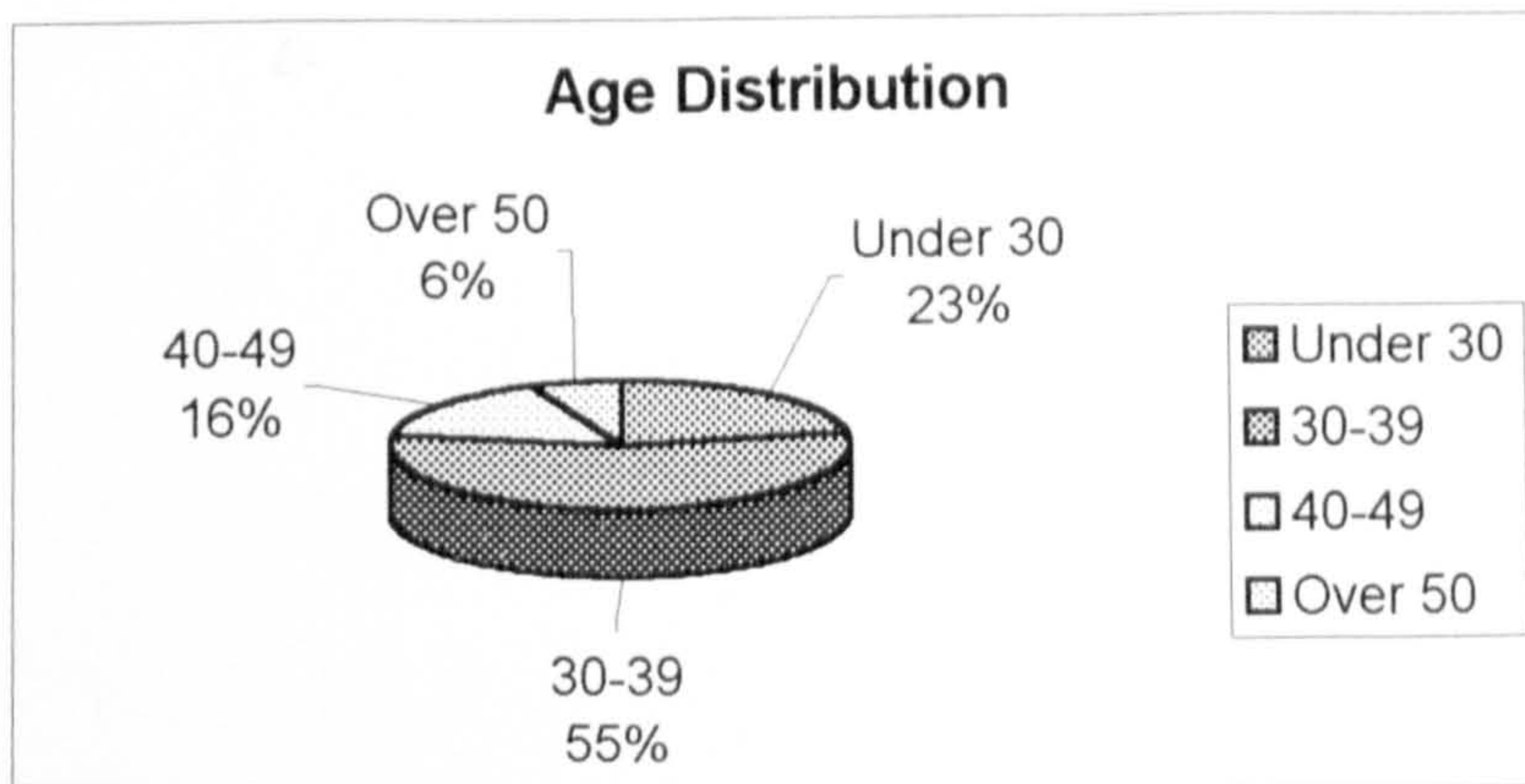


Figure 1: Age distribution for data set

Thirty-one women engineers contributed to the study and their ages range from twenty-three to fifty-six and the age distribution is shown in figure 1 above. In selecting women to take part, I was keen to include women in a range of personal circumstances. Of the thirty-one women, sixteen were married, five were living with a partner, eight were single, one was separated and one divorced. Thirteen women had school age children and one had adult children who were living independently. These features are illustrated in figure 2.

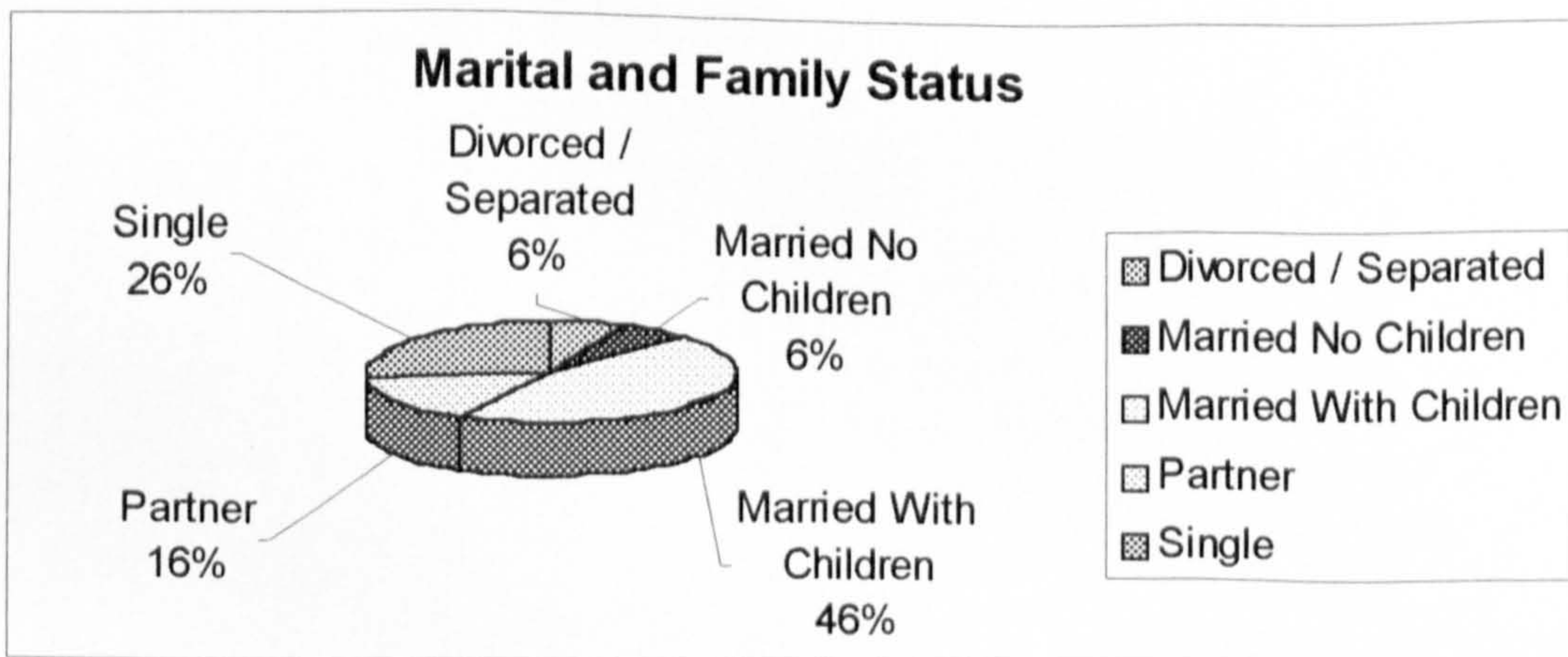


Figure 2: Marital and family status

Walby (1990:54) identifies a form of labour market segmentation as the division between full-time and part-time work and I wanted to see if this division was significant within civil engineering in affecting professional progress. Only six women were working part-time and of these five had school age children; these five women had chosen to work part-time specifically so that they could combine their career with looking after their children. All these women explained that they felt that taking a long career break would have detrimental effects on their future prospects so this was not a viable option.

As discussed in Chapter Two, civil engineering is split principally between the consulting and the contracting functions but civil engineers are also to be found working for government agencies, architects, in academia, within the utilities and for research and development companies. It was not realistic to expect that I would be able to interview women representing all these diverse aspects of the business, however, I did manage to achieve a reasonable representation and this is illustrated in figure 3.

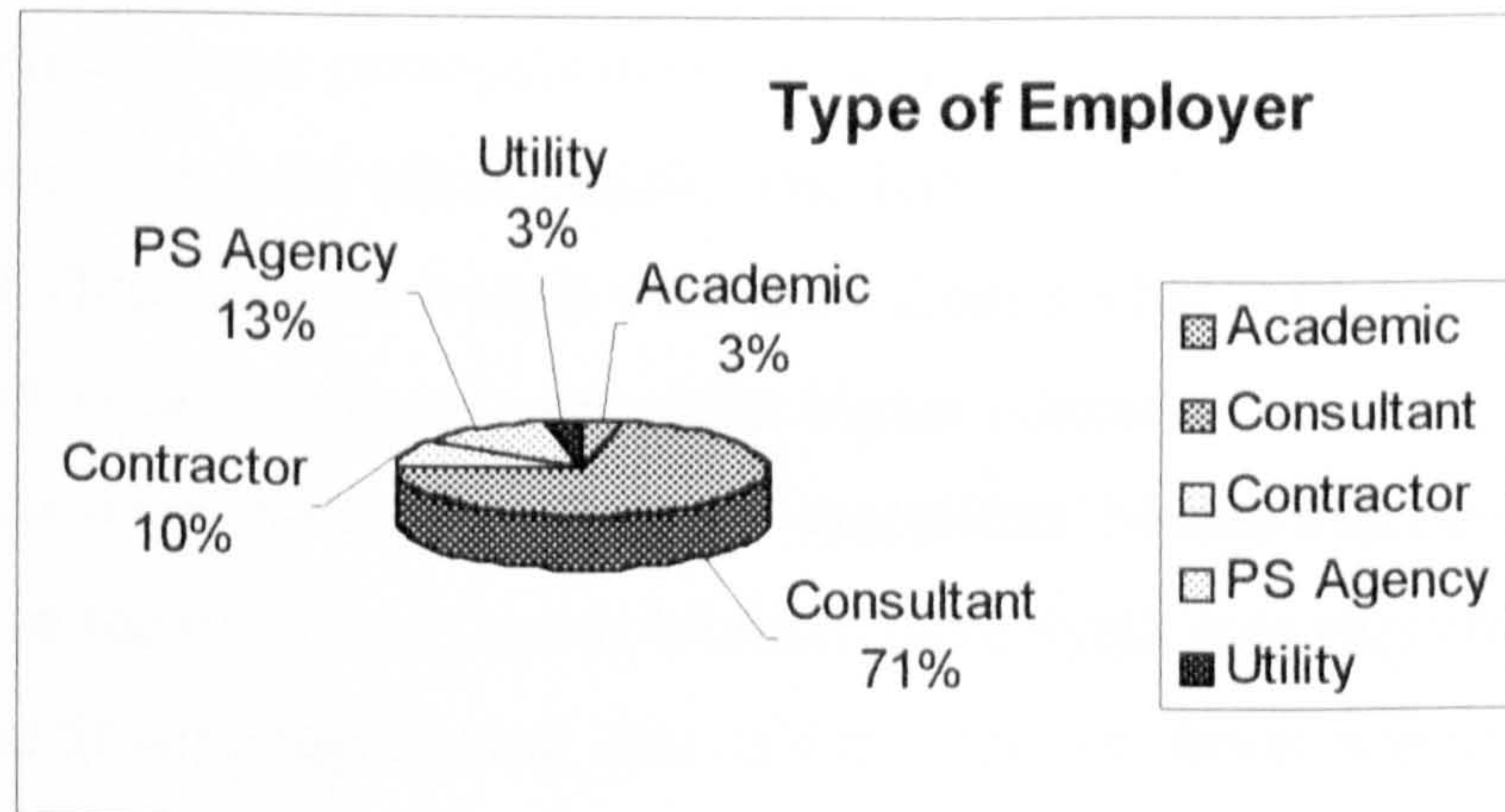


Figure 3: Distribution by employer type

As is to be expected the consulting side of the industry had the highest representation with twenty-two women working in this area of which three were self-employed. Of the remaining nine women, three were working for a contractor, five were employed by a public service (PS) agency or utility and one was an academic.

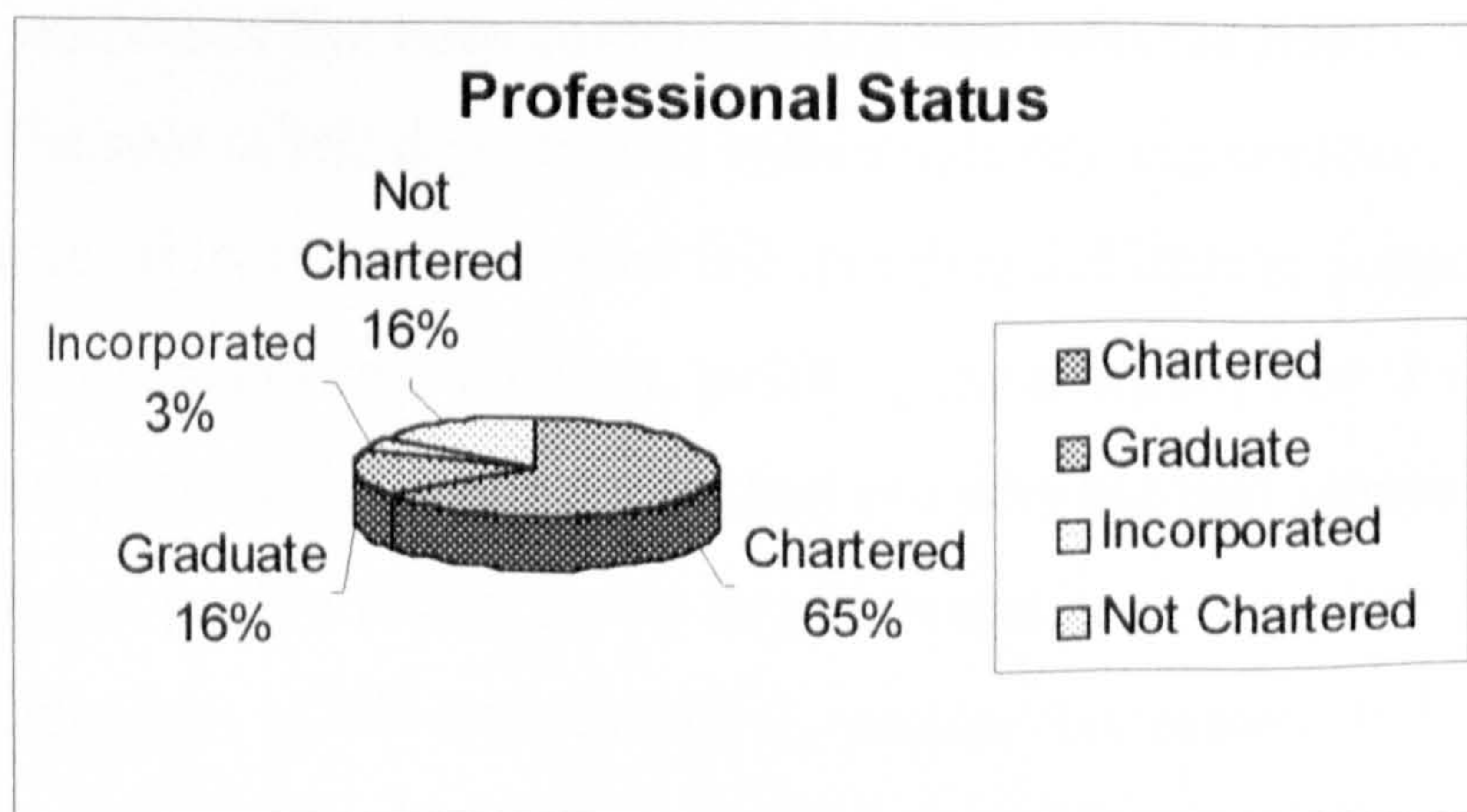


Figure 4: Professional Status of women in the data set.

The issue of becoming chartered emerged as an important one in terms of benchmarking professional progress. Twenty women had achieved chartered status and a further eight were working towards this goal. The amount of time taken by each woman to complete

this process varied with the shortest time being three and a half years and the longest, ten years. The group included some women who were in director positions and others who were in management roles. Three women hold the post of main board director with a further two in associate director positions; a majority of the rest was interested in pursuing management careers within the profession. Only five women indicated that they were not attracted to the management side of the business.

This brief summary of the participants is intended to give a flavour of the diversity of the group in terms of age, personal circumstances and area of work. All the women with three exceptions were from white middle class backgrounds, which is what I would have expected. One, Victoria Joseph who came from a white working class home, was not encouraged by her family to enter either higher education or the professions. Meena Patel and Geena Amrouni are the other two exceptions. Meena Patel is the only South Asian woman in the study and Geena Amrouni from Syria, was expected to choose either medicine or civil engineering. She said that she had never regretted her choice.

Arising from an editorial piece that appeared in the NCE, I also met with Brenda Cole, HR manager for a large multi-disciplinary consultant based in the Thames Valley. The article mapped the progress of initiatives implemented by the company to try and tackle problems related to attracting quality staff and to improving staff retention. The article indicated that the company was evaluating its staff development strategy and suggested that its induction and mentoring schemes were making a real difference to staff retention and overall company performance. My meeting with Brenda took place after the thirty-one interviews had been completed and was relevant from a number of perspectives. The role of HR departments within industry organisations had been universally criticised by the women who felt that they did little to support staff and were generally agents for senior management, peddling the company line. I was keen to discuss this perception with Brenda and to find out why her unit seemed to have established a higher profile within such a large international corporate organisation. In addition, it usually falls to HR departments to oversee recruitment and selection procedures and advise on health and safety matters and these are all of central interest to this study.

My meeting with Brenda took the form of an informal and frank discussion about the role and effectiveness of her unit and some of the detail of equal opportunities policies she was putting in place relating, in particular, to staff retention. The information she

shared with me added considerable insight into how equal opportunities, as a 'top-down' change agent, can be made more effective through the use of very practical and transparent measures. Her understanding of why women earn less than their peer male colleagues points to lower negotiated 'joining' salaries for women and is useful in illuminating this issue.

3. Detailed participant biographies

I have grouped the participants according to their current position within the industry mainly in terms of the organisational or structural setting within which they work and their place within the general hierarchy of the industry. As well as giving details of their age and personal circumstances I have tried, in these 'cameos', to encapsulate what I have interpreted as being the main essence or special features of their account. I came away from each interview having been impressed by at least one particular aspect of the account so that I now associate certain themes or issues with particular women. For example, in two cases the picture of complete industry disillusionment was dominant whilst in another case it was deep personal disappointment that left a lasting impression. I have, therefore, over time come to associate certain of the women with specific issues particularly the problems for women of working overseas, the issue of equal opportunities and what some experienced as the almost crushing constraint of balancing work and motherhood. This should not be taken to mean that it is only these features that have been considered within the analysis but rather illustrates how particular aspects of these individual identities have become firmly embedded within my consciousness.

Three women in self-employed practice

Three women had chosen to leave their jobs in well-established mainstream companies and set up their own independent consultancies. These three accounts are linked by the themes of autonomy and independence within their professional lives.

Susan Hamilton

Susan is forty-nine, divorced with no children or dependent caring responsibilities. She has been working part-time in her own self-employed practice for four years having spent the major part of her career in mainstream consulting achieving the position of acting joint managing director. Her earlier career was underpinned by achieving chartered status very quickly which seemed to propel her through a quick succession of

promotions when at age thirty-three she was promoted to the post of chief engineer. At this point she felt that she had hit a glass ceiling and left the company in order to get the next step up. Her involvement with the ICE and other construction bodies has been mainly in the areas of promoting equal opportunities within construction which she sees as crucial. Her account of this issue is unequivocal; she has given up hoping that the moral case for equality for women, the disabled and ethnic minorities will prevail and now concentrates on promoting the business case to underpin these measures. Working independently has enabled her to develop a very specialist practice within the industry and also has given her time for herself and her leisure interests.

Wanda Jessop

Wanda is forty-six, single with no children or dependent caring responsibilities. She set up her own practice as a response to the problems she faced as a woman in mainstream consulting. She works full-time developing her business having been chartered for fifteen years and having worked on several high profile projects as an employee of one of the most creative and innovative of the consulting firms. Despite her success in this former role, her story is one of disillusionment with the profession that she sees as intrinsically aggressive and dominated by what she described as male “dog eat dog” values. Her experience had placed her in an ambivalent situation where she felt highly valued by the ‘outside’ engineering world but not valued within the organisation where she was working. One of the reasons for taking the risk of setting up her own company was her desire to be autonomous and exercise more choice over her working pattern and types of projects undertaken.

Victoria Joseph

Now aged fifty-one Victoria’s two sons are independent and she is currently without caring responsibilities. She has had a diverse engineering career, having undertaken roles within academia, mainstream consulting, contracting and now as a director for the past twelve years of her own practice that employs five people. In addition she has taken up a number of high profile industry advisory posts and has continued to support the activities of the ICE. The impetus for setting up her own company arose from what Victoria described as her individual way of working and the need to match work with her caring responsibilities. Her view is that civil engineering consultants do not acknowledge that their employees have families and life beyond the job and women who try and remain within these kinds of organisational settings often are more efficient

than male colleagues but are not seen in this way by employers. Although attitudes are slowly changing, Victoria still observes that within civil engineering being a working wife and a working mother is still taboo. Thus Victoria explained that the stated philosophy of her company is that children come first and, though her two sons are now at university, other colleagues have caring responsibilities and this underpins working arrangements for all staff. Victoria comes from a blue-collar working class background which added to the problems she experienced when choosing a career.

Three women in main board director positions

Three women were in the post of main board company director at the time of the interviews. Each was working in a different sector of the industry with one in consulting, one in contracting and one in research and development. Their personal circumstances also differed in terms of caring responsibilities though they were all married to men in highly placed management positions.

Wilomena Franks

Wilomena is aged thirty-seven and married with three small children. She became chartered at the age of twenty-four and has developed her career with a single employer since graduating from Oxford University. She has held her current post of director of a mainstream consultant for a year and is responsible for over a hundred staff. She feels that her management role has moved her away from the technical side of the business and this is something that she misses. She attributed her success to several factors including the development of her human capital with one employer and being supported by a very senior male colleague. Wilomena saw her social identity as a 'mother' rather more integrated in the role of 'parent' and she was clear that discussing motherhood as a workplace issue was neither relevant nor helpful to women. Despite her position of director she was unsure whether her company had a formal equal opportunities policy in place. She had experienced great stress as a result of working seventy hour weeks over quite a long period but had now reduced this to around fifty hours which she felt was manageable on a regular basis.

Wendy Legate

Wendy, who is now thirty-seven, has developed her civil engineering career within the contracting side of the business and has been a main board director for nearly two years. Her appointment arose from a company initiative to have more women within senior

positions. She agrees that this is almost unique within the sector and says that the company's programme of changing its operational culture has been driven by business considerations in an effort to reduce the level of conflict that pervades construction. Much of her career has been spent working on site and this has sometimes involved seven-day working often in less than safe conditions. Since having her two children she has reduced the amount of time she spends on site but still travels widely within the UK. She is passionate about being close to the actual building of structures and has resisted moving into a purely office-based role. She sees her current challenge as "*getting equal opportunities within the construction industry within the next ten years*". Wendy describes equal opportunities currently within construction as hidden and token and therefore pointless without commitment and funding at the highest level. She is clear that her leadership position within her company should be directed towards not only creating change within her own organisation but within the industry generally.

Penny James

Penny is married to a civil engineer and has no children though, at the age of thirty-nine, is considering whether to have a family. She became chartered in 1991 and currently is commercial director of a research and development agency. She considers her role to be part of education within construction which she sees as full of 'dinosaurs'. Despite this, her career has been shaped by the presence of a man, in whichever organisation she has worked, who has believed in her more than she believes in herself. Penny presents a negative view of feminist goals and says that this sort of label can only work against the cause of women in construction. In pushing to improve maternity entitlements within her organisation she has stressed that it is in the organisation's interest to retain staff and capitalise on investments made in staff training and development. She sees construction as confrontational and adversarial, particularly difficult for women and very unlikely to improve in the foreseeable future.

Two women in associate director posts

Two women were in associate director posts. Their level of responsibility hardly differed from those of full directors. This illustrates how job titles are often both subjective and particular to organisations, making role comparison difficult (see Chapter Two).

Miriam McClean

Miriam works as an associate director of a progressive consulting firm and has only recently been appointed to the post. She is thirty-seven, with a partner and they have no children. Miriam has always been clear that she wanted a senior management role within the profession and her career has been developed within both the consulting and the contracting side of the business. Prior to joining her current employer she worked for a very innovative design practice for eight years during which time she worked on some prestigious international projects which she describes as 'inspirational'. Miriam became chartered in 1990. She experienced the process as discriminatory when comments were made about her gender and her appearance at the final corporate professional review. At that time there were very few women available to sit on the review panels and Miriam feels that it is only in the past couple of years that there is any evidence of change of approach within the ICE to this final part of the process. She is committed to supporting the Equal Opportunities Forum of the ICE and specifically to improving the prospects for women within the industry. Her vision of equal opportunities is detailed and relates to day-to-day working practices as well as to recruitment, development and promotion.

Wendy Johnson

Wendy, at fifty-six is the oldest woman in the study. She works for a mainstream consultant as a specialist in an associate director role. At the time of the interview she had just been informed of the company's intention to offer her a post as main board director. She has recently separated from her husband and they have no children. Wendy's story focused on her early career development and how she felt that she was a pioneer at the time. Working on construction sites as a woman thirty years ago was a rarity. She feels that this worked to her advantage and that the labouring staff, far from ridiculing her, were protective. Her view is that although there are greater numbers of women in the profession now, which might suggest improvements, because standards of behaviour generally have deteriorated within society, women are often treated disrespectfully on site. She speaks of the conflict between home life and the demands of a career and referring to her separation from her husband feels that she is back in control of her life and able to enjoy work again. She associates her forthcoming promotion with her new 'single' identity.

Women working part-time in management functions

The next group of biographies is comprised of women who currently hold middle or senior management posts. Some of these have project management roles rather than line management roles and some have both. As discussed in chapter two, defining roles and having a picture of what job titles actually mean in terms of the associated tasks is problematic and therefore I will not attempt cross-comparisons. The theme that connects the next four biographies is part-time working. In each case this arrangement had been chosen to combine work and family life and had been negotiated when the women had been with the employer for a long period in which time they had become established and valued. These women have satisfying careers which, apart from one case, do not seem to have been compromised by these changed work arrangements.

Patricia Knight

Patricia is thirty-eight and a chartered engineer working for a mainstream consultant in the north of England as a project manager. She has some line management responsibility but sees her main function as overseeing projects from inception to conclusion. She is married to a civil engineer and they have two young children. Patricia was very ambitious in the early part of her career and became chartered quickly in order to be eligible for promotion. However, she is no longer interested in further management responsibility as she feels that the financial reward is not sufficient to compensate for the increased stress. She feels that her experience within the profession has been relatively smooth and considers the problem of sexual harassment to be an individual matter rather than a structural issue.

Tania Forrest

Tania works for the same company as Patricia but in their head office in Surrey. This has been her only employer. She is thirty-nine and married to a civil engineer who works for the same employer and they have two school age children. Her job title is project manager and her specialism is in water hydraulics. Tania is not chartered and feels that this has not hampered her career. She sees only two pathways within the profession, one technical and the other management. Her career has taken the management route and she has responsibility for a number of projects though none of these are the larger ones. She feels that because she works part-time colleagues may see her differently because they are aware of her 'other' roles. She was the first engineer within the company to request part-time working to accommodate family commitments

and feels that this was accepted because of the skills she had to offer that could not easily be replaced. She comments that others have followed her example so that this is now an accepted arrangement across the company. She has worked extensively in Asia and South America. This has stopped since the birth of her children though she feels that there has been no associated loss of status. Tania views her current working pattern as an important feature of a balanced life and wanted to contribute to the study specifically so she could demonstrate that it is possible to combine a successful professional career with children.

Gemma Sales

Of the four women working as part-time managers Gemma's career has progressed the furthest, although at thirty-three she is the youngest of them. She works two days per week in a senior role that was created for her and reports to one of the main board directors. Although the role does not involve any line management responsibility it incorporates project management. Gemma works part-time so that she can care for her son who is nine months old.

Her current employer is featured as one of the company case studies in chapter two and she has been with them for eight years. Her experience has been in both consulting and contracting and her project management experience has been high profile with responsibility for projects with a capital value of £50m. Her personal experience of the chartering process has been smooth though she is aware of inconsistencies with other candidates who were members of her team. This has led her to question what she sees as the subjective nature of the process and the validity of the outcome. She hopes, in the future, to be able to contribute time to the ICE in this area of its work.

Fiona Kent

Fiona is thirty-four, married to a publisher, and they have two pre-school age children. She works part-time as a chartered senior environmental engineer for a specialist consultancy. She studied at Oxford University and was keen to pursue an applied career in engineering. From the outset she was interested in management and before the birth of her first child managed a small team working on environmental projects. Returning to work after maternity leave she resumed this role on a part-time basis as agreed with the director of the organisation. However, she has not been offered support by senior management in her changed work pattern and it has been made clear to her that part-time working and management is not seen as compatible. She will be leaving the

organisation to work independently in research and consulting. She is very disappointed with this outcome and points to the 'gap' between intention and practice, on the part of her employer, to underpin her return to work with a flexible approach to meetings and project planning. Another important feature of Fiona's story is that although now chartered, this took ten years to achieve (the longest time in this study) and was a difficult process due mainly to changed regulations implemented by the ICE but also to lack of effective supervision offered by her employer. Fiona finally successfully completed the process just before the birth of her first child and she realised that once she had a family it would be almost impossible to finish this.

Women middle/senior managers

Seven women currently hold middle/senior management posts; they have different personal circumstances but all work full-time either for consulting firms or public sector agencies and in one case for a utility. These women have, at an early stage within their careers, identified management as a main objective and with one exception are all chartered engineers. All the women have successful careers but their accounts include a range of cultural obstacles to their progress. For some these difficulties continue to place considerable strain on both their personal and professional lives.

Susan Leyton

At forty-seven Susan is chartered and the oldest of the seven women. She is married with two children at secondary school and works in a management function for a mainstream consultant in Reading. Her career includes three years spent on site managing a £11m project but her recent work has been office-based and has been characterised by what she sees as inequitable treatment in relation to promotion opportunities. She is sure that her management prospects have been affected by her gender and she is not confident that she can progress further with her current employer. She believes that women encounter prejudice when they attend their corporate professional review to become chartered and has offered her services to the ICE as a reviewer specifically to try and do something about this issue.

Pauline Jenkinson

Pauline is forty-five, single and works in a senior post with a utility company as a chartered engineer. She has considerable site experience both in the UK and overseas though has encountered difficulties in being considered 'suitable' for overseas postings.

She suggests that the single female engineer working as part of an ex-patriot community is viewed by the wives of male colleagues as potentially threatening and destabilising. Fitting into this setting can be a difficult and isolating experience. Pauline has also personally experienced sexually harassing behaviour on site and in the office and has challenged this in both settings. Her account refers to the continued display of pornographic material and use of sexist language with little evidence of commitment by senior management to change this culture.

Helen Zell

Like Pauline, Helen is single with no caring responsibilities and has worked overseas for short spells on a range of water projects for a mainstream consultant. She is thirty-seven and is now chartered, having failed her corporate professional review at the first attempt. She found the process adversarial and prescriptive and, more than anything, felt that she was not listened to by the all-male panel which she was sure had decided on the outcome beforehand. Helen is interested in wider management opportunities and in working for longer stints abroad but believes that some male colleagues may see her as a liability in this role in respect of working in particular countries. She feels that this may deter further management progression as an increasing amount of her company's business is conducted overseas (see chapter two).

Linda Cook

Linda is the only woman of this group who is not chartered. She is thirty-nine, married with one young school-age son. Linda's career has been within the contracting sector and she currently works full-time leading a major industry initiative looking into how to improve work practices within construction. She believes that management within the sector should be more collaborative and less hierarchical. Linda has achieved high profile professional success despite not being chartered though she feels that generally this is important. She has recently approached the ICE to discuss how she can now follow this process but has encountered a negative response. She considers that the ICE operates within prescriptive constraints that can often present barriers to professional progress rather than acting as enablers. She has abandoned this as a possible route to becoming chartered and is currently investigating alternative possibilities.

Karen Shaw

Karen and Linda appear to share much in common: both are dedicated to a career within management and have achieved high profile positions within the profession. Like Linda,

Karen has one small son and works full-time. Her current responsibility is as a chartered senior project manager for a public sector development agency. Her attraction to management is that it places her at the thinking end of civil engineering rather than at the doing end. She characterises management as very female because it is people-based. She feels that she has had to overcome discrimination from male colleagues who she feels have been threatened by her ability. Her view of the construction industry is that it is not transparent and she believes in a decision-making audit trail which traces why decisions are made. Karen is committed to improving the way that the ICE operates and her long-term goal is to become its first female director general.

Geena Amrouni

Geena is Syrian and works in a middle management role for a public sector research organisation. She is thirty-six and has two young children but has never considered working less than full-time because of the fear of being seen to be less committed to her career. She has had a lot of site experience and enjoys the actual building of structures. During her periods on site she experienced offensive behaviour from the labouring staff but felt unable to challenge it. Her role now is office-based and she feels that this fits better with her family life. When her first child was born she felt that she could only take six weeks maternity leave due to pressure of work and the negative image of professional working mothers within the industry. Her senior management team is supportive but she feels that similar support would not occur within either mainstream consulting or contracting where a culture of long hours underpins all projects. In her current management role she feels very separated from the disciplines of science and engineering and although management is regarded as a discipline in its own right, she says little training is offered to enhance performance.

Melinda Jackson

Melinda is a chartered principal engineer working in a senior management role for a long established consultancy firm. She is married with one school-aged child. She works full-time managing large projects and is responsible for the staff working on these. When we met Melinda had two main concerns. Uppermost was the fact that she was then four months pregnant with her second child but could not bring herself to discuss this with the managing director to whom she reports. She explained that no female technical member of staff had ever gone on maternity leave and she was dreading how this would be received. Also she had just been offered the opportunity to

'cover' for a director who would be absent from his post but would not necessarily be paid additionally for the added responsibility. She regarded this as discriminatory and was unsure how she will deal with the situation. Apparently the view of her boss was that this was an opportunity for her career progression rather than a reason to be paid more. Of all the women she expressed the greatest concern about the confidentiality of the interview and she spoke of the tremendous stress she felt in relation to her current situation.

Women who have rejected the management path

Five women were clear that they did not want to move into management. Their reasons varied and related mainly to their personal circumstances or to their view of the industry. I begin with a brief biography of Miranda Ellis who, at twenty-five, is the youngest of the five.

Miranda Ellis

Miranda works full-time for a mainstream consultant in Croydon as a transport engineer. She has a partner who is also a civil engineer but he works for a different employer. She is working through the chartering process but feels that it will be at least two years before she is ready to sit the professional review. She particularly enjoys the technical side of her work and has no wish to go into management which she regards as more about managing people than managing engineering problems. She may be interested in changing her specialism but will not consider this until after she has become chartered.

Naomi Gill

Naomi is twenty-six and has been with her employer since leaving university. Her partner is a civil engineer who has worked quite a lot overseas and this is something that Naomi would like to do. She has worked on road and bridge design and is keen not to become too specialised which might narrow her options in the future. She is following training under agreement to become chartered and is unsure of how much longer this might take. She has no management ambition and feels that the low pay levels within the industry do not encourage or adequately reward greater levels of responsibility.

Paula Alexander

Paula is thirty years old and works part-time for a mainstream consultant in Surrey. She has one young son and is married to a civil engineer. She is trying to balance her

professional role with her caring responsibilities and is also preparing to re-sit her professional review which she failed during the early weeks of her pregnancy. She has considerable experience of site work which she found interesting but harrowing because she felt unsafe and threatened by male colleagues. She has no organisational management ambition as she sees management requiring a commitment to long hours. For Paula an ideal way of working would be in a self-employed role within the industry.

Christine Allen

Christine is thirty-three and works full-time as an incorporated engineer with a consultant in Buckinghamshire. She has no caring responsibilities and her partner works as a manufacturing engineer. She speaks of a future without children from choice and intends to remain within the profession. She enjoys her current role but is put off management because she sees it as essentially political and very stressful. She finds the detailed technical work she does challenging and would not feel comfortable in a management post that removed her from her science.

Gillian Hayes

Gillian is thirty-two and works full-time in York for a public sector agency in the environmental sector. She is married to a civil engineer and has three small girls. She is not chartered due to problems transferring her training agreement between employers but considers that she has the same credentials as chartered colleagues because of the depth of experience she now has acquired. For Gillian the options rests with pursuing management or staying close to the engineering discipline and becoming more of a project specialist; she sees herself more suited to the latter role.

Recent recruits to the profession

One participant was a new recruit to the profession and a further four considered themselves to be still very much in the formative stages of their career and were still deciding how best to further their career. The choice between being a specialist and a generalist is a very real one in a profession that is comfortable with compartmentalisation. Even in the highly specialised field of water hydraulics, for example, moving from river to coastal hydraulics is regarded as a distinct change in direction. The next five biographies start with Meena Patel, who at twenty-three, is the youngest woman in the study.

Meena Patel

Meena works for a large multi-disciplinary practice in Surrey as a graduate engineer concentrating on transport projects. She is engaged to be married. She is the only South Asian woman represented in the study. She is starting to plan for her long term future and is encountering problems with her fiancé's family who consider her professional role incompatible with her role as wife. She is concerned about the culture of long hours and recently has been working in the office until eleven in the evening. She is attracted to management but feels that the culture associated with this of long hours, high stress levels and weekend working would not accord with her married status in the eyes of her family. She has begun her chartering training and is trying to complete the site work she has to do as part of this process before she gets married. Working in the strongly male environment of the construction site, as a married woman, will not be considered appropriate by her husband's family. Meena has to resolve how she will deal with these conflicts posed by the dominant culture of the profession which is that work always comes first. Of all the women's accounts Meena's is the most enthusiastic about work. She loves her work and is full of optimism for the future hoping at some point to assume a management position.

Marion King

Marion is twenty-six and works as a project engineer for a specialist company in Oxfordshire. She lives with her partner, having moved down from Scotland where she was brought up and educated. Marion was undecided about whether or not to take a PhD and in fact started this but found that study at this level was incompatible on a part-time basis with the professional demands of her role. She is now training under agreement and considers that this professional development will advance her career more than further academic qualifications. She considers that being chartered brings recognition of professional competence and those working on the theoretical side are not so highly regarded. For the longer term she is hoping to move into management which she sees as the mark of success.

Mary Jones

Mary, aged twenty-eight, works for the same company as Marion but joined only recently. Her role is graduate engineer. She is being sponsored by her employer to become chartered but is also keen to develop management experience as soon as she can. Currently, she is unclear whether to follow the technical or the commercial side of

the industry. A major concern is that some good engineers are lost to the management side of the business and she would find this detrimental. On a personal level she has moved to the south from Scotland to take up this job opportunity but her husband has not been able to join her as he is still completing his studies in Scotland. At the time of the interview Mary had just been offered a six-month posting on a construction site in India. She has agreed to this mainly as a way of advancing her career though she is not expecting this to be without difficulties, both practical and cultural.

Clare Sanderson

Clare is a twenty-six year old graduate engineer working full-time for a large contractor. Her partner is also a civil engineer and she considers that his professional perspective adds to her understanding of the construction business. She is based on a construction site in Hertfordshire and has been with her employer since graduating. She has completed most of the objectives of the chartering process and hopes to complete this in the next year. Clare has not yet had the opportunity to manage her own projects but is expecting to undertake this soon. After some uncertainty she now sees her career within the operational side of the water industry and has decided to specialise in this area. She has the clear aim of moving into management in either consulting or contracting but is keen to have a family and has decided that she would prefer to take a career break for several years. Another alternative that she and her partner have considered is taking up a job-share to allow both of them to continue with their career. This is an unusual arrangement that Clare feels is dependent on the attitude of individual employers but she is optimistic that this would be viable.

Barbara Bing Turner

Barbara works as a graduate engineer on river engineering projects for a specialist company in Oxfordshire. She is twenty-nine and single and has no caring responsibilities. She is moving towards the final stages of becoming chartered which she sees as absolutely essential for career progression. Her career to date has included working for both a mainstream contractor and consultant and she has now decided to concentrate on design and modelling and to specialise in flood alleviation work. Her objective is to move into management; an activity within civil engineering that she feels is generally not done well. She sees her role as an engineering scientist and as a senior manager would be unwilling to lose touch with technical problem solving.

Two women focusing on change

Two women's stories do not easily fit into any of the previous clusters. Molly Peters is the only academic represented in the study and Helen Coates is the only woman interviewed who is intending to leave the profession. Their stories revealed some common themes relating to a dislike of the adversarial nature of the profession and distaste for the deeply embedded denial of a life outside and beyond work. Their accounts also focused on change. For Molly Peters the change from working for a mainstream consultant in Surrey and taking up a post as an academic in Northern Ireland had already taken place, whilst for Helen Coates, the prospect of embarking on a completely new career had not yet taken shape.

Molly Peters

Molly is thirty-eight years old, single and now works as a full-time academic within a university. Prior to this she worked for many years in Surrey for one of the largest consulting firms and became chartered eight years ago. She completed her doctoral studies before joining mainstream practice, wanting very much to undertake postgraduate research. Her experience of practical engineering was that it took over her whole life and she found the business very competitive and driven by an expectation that engineers would work very long hours. She experienced this as damaging to her personally and so decided to move into academic life which she saw as pressurised but offering more flexibility. Her management ambitions have always been limited and she feels that the stress of management goes largely unrewarded.

Helen Coates

Helen is thirty-six and single and is currently working as a senior chartered engineer for a large consultancy firm in Buckinghamshire. She has been with her current employer for ten years where her work has focused mainly on aid-funded irrigation projects in developing countries. Helen wants to leave the profession which she sees as characterised by conflict and inhuman ways of working and is hoping to re-train, possibly to teach young children. She feels disillusioned with the industry that she sees as based on a model of 'one upmanship' with little co-operation between parties. She is hoping to create a better work/life balance recognising that life outside work is at least as important as life at work. Her suggestion to her employer that she could work as part of a job-share was met with incredulity and this has confirmed for Helen the need to

change her work completely if she is going to have any hope of living the kind of life she wants.

4. Conclusion

This chapter has outlined the participant profile to introduce the next three chapters that discuss the main research findings. The way that I have chosen to group the biographies is clearly not the only way of organising the material and a re-working of the data could produce different structures. It is not possible to outline in greater depth the women's histories and I have thus concentrated on my understanding of what appeared to be the most significant aspects of their accounts. The stories are all different but common themes running through them are an enthusiasm for their professional role and a recognition that changing work practices would benefit the industry generally, not just women. Although the women's histories are individual, they are connected through talk of a construction industry that is changing and a civil engineering profession that is struggling to adapt. The chapter that follows has as its theme the concept of subcultures within construction and discusses how this is perceived and experienced by women within the different contexts of civil engineering.

CHAPTER SIX

SUBCULTURES

1. Introduction

Subculture within the workplace consists of attitudes, assumptions and expectations that are developed over time and become represented within processes, policies and procedures implemented by organisations. Subculture effects the way employees interact with organisations and impacts on individual career progress (Ashburner, 1994). Subculture takes many forms and can be expressed, for example, as formal policy or it can function in more subtle ways through unspoken beliefs or opinions that inform both corporate and individual behaviour. The subculture of professions operates to protect expert knowledge and practice via strict 'entry' criteria designed to maintain professional standards. The civil engineering profession has its own set of values and working practices that have developed within a male-dominated construction industry. Civil engineering has been characterised as being at the 'elite' design end of the building process and, as such, has been more closely allied, for example, to architecture than some of the other building professions. This chapter will discuss how the thirty-one participants experience the subculture of this 'elite' construction profession in relation to the different functions and settings that make up the industry.

The discussion takes as its starting point the male-dominated nature of the profession. Apter (1993) argues that power, ambition and organisational politics are linked to masculine values and men who control the professions want to maintain this power and are reluctant to compromise their hegemony by sharing power with women. Connell (1995) develops this theme and suggests that the social construction of masculinity is inherently relational and is dependent on its contrast with femininity, which gives rise to the concept of gendered difference in the way men and women are treated and are expected to behave (see Chapter Three). The dominant culture within construction is masculine (see Chapter Two). This chapter explores how women, as a minority group, access this dominant culture and how they adapt to the conditions in the workplace produced by these cultural values.

Culture is expressed and reproduced through actions, language, events, rituals and traditions and some of these are rich in symbolism and meaning (Alvesson & Billing, 1997). Workplace culture is developed through the operation of a range of organisational structures and patterns of interaction that draw on expectations, roles and rules. The world of construction and the culture and subcultures it creates and claims for itself form part of the theoretical framework of the research and these operate on a number of levels and in a variety of settings (see Chapters Two and Three). Different firms operating within civil engineering have their own particular cultural practices and the women's stories reveal how these are experienced at a 'local' and individual level. The politics of the profession is uncovered, with an emphasis on how the informal rather than the formal (summed up by Wanda Jessop as "*the who-you-know type approach to getting promotion*") can often be the way to get things done.

The chapter comprises five sections that discuss how the participants experienced different subcultural forms operating within the profession starting with their response to dominant stereotypical role expectations within the profession. This is followed by discussion of how they negotiated the various organisational and physical contexts of the profession focusing on construction sites, the chartering process including their experience of the ICE and lastly their experience of management.

2. Stereotypical expectations

One of the interview questions asks whether women civil engineers see themselves as 'different' in that role from male colleagues and whether they feel that they are perceived as different by their male counterparts. A factor influencing responses to this question was the role that fathers and other family members had played in introducing some participants to the world of construction. Of the thirty-one participants, ten had fathers, uncles or grandfathers who were engineers and their influence and encouragement was commented upon in each case. This, I felt, was significant in that the women with this background seemed to feel that their choice of career was less non-traditional than some of the other women who had had little or no contact with engineering as part of their childhood or youth. Several of the women whose fathers were civil engineers spoke about how they had occasionally accompanied their fathers to work and how they had enjoyed this experience. Helen Zell, for example explained: "*I used to go into the office with him when I was quite*

little and I always enjoyed it. That was what probably put the initial idea in my head in the first place". Gillian Hayes, from Yorkshire and one of five children, had regular contact with the profession from an early age: "Dad always when he could took me to site visits, he took me round the office, allowed me to meet his peers, allowed me to meet with his managers and to discuss industry with them. So there were opportunities there for me".

Marion King, who had been brought up in Scotland, felt that the influence of her father's role as an engineer had a strong but subtle impact. She explains *"my dad's an engineer and I can remember when I was a child and sometimes when he was going into work in an evening to pick something up I would go with him to have a look at what was going on and things like that. I was always just aware of what he did"*.

Barbara Bing Turner, speaking about her father's career as a civil engineer, commented that: *"he had a great enthusiasm for his subject which must have translated to me in some way. I am not sure whether that is an advantage or disadvantage but he was definitely a strong influence on my choice of career"*.

The influential role that fathers played in smoothing the way for several of the women to take up civil engineering cannot be overestimated. These women explained that they felt comfortable with their choice and that the support from their fathers gave them confidence as they began their university courses. This was in contrast to some of the other women where the whole discipline of engineering was an unknown quantity to them and their families. Their accounts show that the 'settling in', both at university and then at work, took longer. The influence of family in helping break through the stereotypical male subculture of the profession was shown to be very powerful not only in relation to initial career choice but also in terms of offering ongoing support for their progress. These findings, that an enthusiasm for engineering can be 'inherited', are consistent with those of Court and Moralee (1995) and an EPSRC (2002) report which found that knowledge of working in a male-dominated environment, derived from a close personal relationship with someone already involved within it, acted as the most positive influence on career choice.

It came as no surprise that none of the women had mothers who were engineers but a study twenty years on from now might uncover the influence of the 'engineering mother'. Although the influence of close male family members was strong, so too was the attitude of the women's mothers. With only three exceptions, the women spoke of

the encouragement they had received from their mothers when making their career choice. In fact, only three mentioned any negative role stereotyping by friends or family members of the choice they had made. In this respect, it was evident that the women generally had been made to feel positive and optimistic about their choice of career, at least by their close associates. The fact that civil engineering was still considered a non-traditional profession by most of the women was not construed by them as a problem.

Those participants who had not benefited from an early introduction to the industry from male family members generally did not identify themselves as very different from their male peers, but there was a whole range of discussion about the ways in which they were treated differently. Wanda Jessop's very clear reaction was mirrored by more than half the women: "*women engineers are seen as different, there is no doubt about it. Despite all protestations from men*". Mainly as a reaction to this response to women in the profession, Wanda had decided to leave corporate life after twenty-two years and establish herself in her own small consultancy where she could practise her own brand of civil engineering that she described as being more '*human*'.

Linda Cook, who works for a large contractor suggested that the extent to which women are treated differently, especially on site, actually depends on the individual woman and the way she presents herself in terms of her personal appearance and behaviour. This tends to suggest an individual rather than a structural cause for this treatment, with the responsibility placed firmly with the female in question. Linda, although in the minority, was not alone in this view. Miriam McClean, who is an associate director with a consultant, saw this slightly differently and referred to the personalities of the different people involved, both male and female. She identified age as another factor in the process: "*I find that the younger male engineers have absolutely no problem if you are male or female. It doesn't seem to matter to them. The older people sometimes have a problem working for a woman*".

Her use of the phrase 'older people' seems to refer to both men and women although with so few 'older' women in the profession, in practice this implies that it is older men who have problems working for a female manager. The perception that women engineers are available in the office to perform additional secretarial tasks, such as taking telephone messages and doing photocopying, was commented on. Although the women did not feel that their professional standing was directly impaired as a result of

this, it was nonetheless irritating and was felt to be demeaning. Linda Cook's comment illustrates the point well: *"I think that there is always the odd person that expects you maybe to go and do the typing because the secretary isn't there or something. There is still the odd person, little pockets of old attitude"*.

Miranda Ellis, one of the younger women in the study, expanded on this theme:

"I feel on the technical ability you are seen equally but I also feel that if there's sort of admin tasks to be done they will ask the female member of staff to do it. Everybody has to do photocopying or filing at some point but I have worked in three different offices now and if there is a pile of photocopying to be done and there are male and female engineers they will ask the female engineer to do it".

Susan Hamilton decided early on that she would have to adopt a strategy of not making the tea and being 'mum' and would only help with this if the tea making had been started by one of her male colleagues. Being one of the older women, Susan emphasised throughout our discussion that for the first ten to fifteen years of her career there simply were no female colleagues at all in technical functions.

The issue of expectations and how one should 'be' at work was a theme of the responses. Karen Shaw's comments sum up many of the views:

"My experience has been that there are two types of female engineer really. One is the stereotype engineer who dresses like the lads, drinks like the lads, smokes like the lads sort of thing and the other one is the one that really skirts around, isn't very good at anything (these are two extremes) but manages you know to get through and she is a token woman if you like in the company and then there is everything in between that".

These comments suggest that a woman's role as an engineer is often compromised by expectations of the socialised role of women as 'helper' and 'supporter'. Breaking out of this mould can present women with a conflict about how to behave to ensure that they are not discounted or made invisible within a strongly male-led subculture.

Meena Patel was one of several to talk about her experience of dealing with clients and the stereotypical expectation that projects are managed by men:

"Colleagues are brilliant. The problem I have seen is with clients. I spoke to this man on a traffic management scheme I think it was and I made some suggestions and he said I want to speak to an engineer. I said well I am an engineer. And he said are you a qualified engineer".

For Meena, an Asian woman, understanding bad reactions to her at work could be explained on a number of levels: *"I can't tell whether they're reacting badly because I am Asian, because I am a woman, or they just don't like my personality"*.

These types of comments were felt to be undermining but the women appeared philosophical about their impacts and their reaction tended to be resignation rather than anger. These expectations are rooted in the concept of 'women's work' that in a business setting could be characterised as administrative or support activities aimed at enabling others (mainly men) to get on with the important or serious work. This concept applies both in the private and public sphere and is encapsulated in Gilligan's phrase "*woman's place in a man's life cycle*" (1987). These kinds of 'support' work are perceived as useful but 'powerless' and are removed from the decision-making arena. This explains on a theoretical level why women such as Susan Hamilton are determined not to collude, even in seemingly trivial ways, with patterns of behaviour that further constrain or stereotype women (Apter, 1993:180). Susan was clear that individual attitudes and behaviour help maintain and reproduce social forms and although small individual actions are unlikely to have transforming affects at an organisational level, her approach was that you have to start somewhere and take an explicit stand.

The different subcultures within construction are strongly influenced by workplace setting and I now move on to consider how women experience the particular subculture of the construction site that has developed its own procedures and social 'rules' connected to the hierarchy of relations in the site workforce.

3. Construction sites

The discussion about workplace culture within civil engineering covered many issues including discrimination, harassment, equal opportunities, diversity and exclusionary practices more generally. Some of these issues were raised by me and some, particularly harassment, were brought up by the participants. When discussing obstacles to professional progress experience of working on a construction site appeared crucial. Almost without exception, site experience is an essential component of the chartering process and therefore it is difficult to avoid. For many women this is a difficult and demanding experience for a range of reasons including a very macho working scene, difficult physical working conditions, long hours often including weekend working and the emotional strain resulting from isolation as usually the only woman on the site. Often it has been the physical conditions of the building site that has been used as the excuse to exclude women from the construction professions (Greed, 1999:14). Most of the respondents, however, found that the physical

environment was not nearly as harsh as the social environment. Not all found their site experience difficult but they were a small minority. Wendy Johnson, for example, spoke about how much she enjoyed her work on site carrying out soil investigations whilst being surrounded by Irish labourers whom she described as “*gentlemen most of the time*”. Being the only woman on site was a positive benefit in enabling her to fulfil her professional role because she felt that her ‘difference’ meant that she was acknowledged by male colleagues and her opinion was respected. Clare Sanderson’s experience had been equally positive. I interviewed Clare in a portacabin in the middle of a muddy, waterlogged building site where she worked as a graduate engineer for a contractor. Her experience of site work had been short but very enjoyable and she felt that she had not encountered any real difficulties thus far. In fact, she sounded surprised at the respect in which she was held by her male engineering colleagues, some of whom were twice her age.

Most of the women had enjoyed their periods on site, and this was a major part of why they had become civil engineers; they wanted to build structures and wanted to be part of the ‘live’ building process itself. For most, though, this enthusiasm was not experienced without a price. The main problems seem to be associated with aspects of site subculture connected with representations of sexuality and the implications for women’s safety. This took the form of obscene (and often sexist) language, pornographic material displayed in site offices, incidents of sexual harassment and resulted in an almost constant need for women to establish and reaffirm their authority. The sense that women just do not belong in construction was expressed through words, actions and even silence and some participants identified all these features as part of an undercurrent of hostility. Some said that they could not always quite put their finger on it: just an off the cuff remark or a sideways look or a colleague turning away or simply not being listened to. Visibility was frequently commented on: being noticed or being watched, either out of total amazement, or just plain curiosity, was experienced by some as a pressure. However, moving between the contradictions of being physically noticed and ‘visible’ on one level to being ignored and thus rendered ‘invisible’ on another level created further anxiety for women especially those acting in supervisory roles overseeing the ‘building’ process.

Loyalty by trade is very strong in construction. Workers generally spend breaks with their own trade: carpenters with carpenters, ironworkers with ironworkers, painters

with painters. Women operating in supervisory positions on site as most of the women had done, as REs (Resident Engineers) or assistant REs, would not be expected to mix informally with these groups of tradesmen. (Male REs would not be expected to either.) I use the gendered term because none of the women had found trades women working on a site. There was a clear gender boundary as far as the contracting staff was concerned. Many women spoke of their feelings of vulnerability and social isolation in these circumstances. Part of this vulnerability seemed to stem from the very nature of construction. A skilled construction worker must be able to climb scaffolding, use power tools, lift heavy objects and perform countless other tasks which are inherently dangerous. However, although strength does contribute strongly to the image of construction, in reality the increased use of prefabricated and modern composite materials such as plastic pipe, for example, as replacement for cast iron, and the use of mechanical lifting devices, has significantly reduced the importance of physical strength. This has generated recognition that construction is now a multi-disciplinary process that requires a whole range of both mental as well as physical skills. If the 'setting out', for instance, has been carried out incorrectly and structures or concrete have to be moved and work undone, the RE via the site foremen is reliant on the labouring staff to put this right. So a combination of engineering and manual skills can rectify the situation. The women thus saw their engineering role on site as principally one of giving instructions, checking measurements, carrying out the surveying and overseeing the installation of materials. This in itself was perceived as a gender issue with some women reporting that men just do not like taking orders from women. This hurdle had to be overcome before any progress at all could be made on the job and often establishing any kind of 'authority' took a long time and much personal effort.

There was much detailed comment about experiences of site working and I have chosen to discuss these broadly within the two themes of sexuality and safety which emerged as key concerns. In some cases what they had to tell me was upsetting for them, in others it was amusing and for some, with the benefit of hindsight they saw it as 'character building'; whether they felt that at the time is debatable. Being subjected to pornographic images was a common theme. Pauline Jenkinson commented: "*I spent a year working on site and occasionally for example I might have gone into the*

contractor's office and they would have had posters and things on the wall and that would be embarrassing and I suppose offensive”.

Karen Shaw, having had a very varied career, reflected on her early experiences on site and recalled an argument with a foreman who then never spoke to her again. *“I was very young and that hurt me because he was a really nice guy but I had obviously stepped over the mark. The sexual issues with the language and the behaviour in meetings has often been appalling and I just consider it pathetic”.* Miriam McClean, now mainly office-based in her role as an associate director of a consultant, looked back on her site working days with some pleasure. She felt that this experience had been generally positive, but she referred to the issue of personal comments as a way of undermining one's position: *“I believe it can just take one comment really to have a major influence on a woman. It can have a major impact on her feeling about being at work so it doesn't take very much to be influential”.* Miriam felt that language has powerful psychological effects. Seemingly trivial remarks confirm that men occupy positions within construction reproducing a masculine right and they underpin the psychology of the subculture which is strongly gendered. Technology has been characterised as a culture without people (Strathern, 1997: 494) and although technological changes have altered *how* structures are built (see Chapter Two) these technological processes operate within a set of social relations. My findings show that it is the informal and social interactions that are key to determining the effectiveness of the overall building process.

Going on site as a young graduate was a daunting prospect for several of the women. Wilomena Franks recalled her reaction to her first stint: *“I was quite shy and quite frightened of the men on site”.* Meena Patel, as the youngest woman in the study and the only Asian, expressed dread at the prospect of going on site as part of the chartering requirement: *“you walk down the street and you see a building site and you see typical men. I just fear it, I really do”.* Despite her fear Meena was determined to undertake a period on site which she understood to be necessary to her professional development.

Although Geena Amrouni really enjoyed her two years spent on site on a bridge replacement scheme she commented on some of the difficulties that she faced, both on site and similarly in the office. Incidents of improper remarks, sexual innuendo and

various belittling tactics were described. She was treated well overall but there were aspects of the work that troubled her:

"I used to worry very much about talking to steel fixers who were twice the size of me and telling them that this steel isn't fixed right and they were quite intimidating. They would use their height and their size and say what are you talking about and I would say well actually I don't think that this is right. So that used to get a bit worrying".

Geena's remarks refer to a sense of intimidation experienced by many women and this, clearly from the accounts, has its beginnings in the issue of physical strength and the fact that men on average are bigger and stronger than women. This, coupled with the newness of the situation, not just for the women but also for their male co-workers, required much adaptation with this impacting more strongly on women. Not only had the men possibly not worked with a woman on a construction site before, some probably had little or no experience of working with women in any setting. Connected to this, Alvesson and Billing (1997) argue that in one-gendered workplaces some forms of femininity and masculinity are more intensified and strengthen social relations and a sense of group cultural identity. Their view is that this gives rise to group solidarity based on shared ideas and values. Where highly gendered attributes such as great physical strength (in the case of male construction workers) contribute to high self-esteem, the presence of women who can perform the job equally well may threaten this self-pride. Breaking into these collectives, then, can clearly be difficult for members of the 'other' gender. Barbara Bing Turner was aware of these problems and spoke about how difficult it was for both men and women to adapt to the slowly emerging mixed gender of construction sites. She found her first experience on site rather bewildering:

"it was an enormous construction site. I think there were about four thousand people working on it and actually on the construction side of things apart from secretaries I was one of only two women on the site and there was definitely not so much discrimination but harassment, which was difficult to learn to come to terms with. It didn't put me off because I think I had quite a broad view of construction workers, of how they can be expected to cope with a woman dumped in their midst. I don't think for a section of the industry that has been wholly male-dominated for years, for ever, I don't think that you can expect brickies and steel fixers who are not used to a woman around to completely accommodate you".

The challenge to the single-sex culture of construction by the appearance of women, particularly in management roles has, as already noted, undoubtedly contributed to men's discomfort. This discomfort seemed to take many forms ranging from overt hostility to protectiveness. Without mentors or other female colleagues, women

engineers on site often had to be more assertive and develop strategies, through trial and error, to ensure their survival and their effectiveness on the job. For some women this took up much emotional energy. Susan Leyton referred to this aspect because although she had really enjoyed her periods working on site these had not been problem free:

“there was trouble on some occasions and you had always not to react to it, not let it get you down, not let it make you depressed and really worm into you. If you rose above it and kept saying I am not going to lower myself to their level, you know be distant, you were OK but if you thought about it or were a sensitive person you couldn't cope with it”.

Gillian Hayes, now in a more office-based role with a government agency, described the emotional stress of working on site as: *“very demanding on your personality. You have to be physically and mentally tough because it is rough and ready and although I could handle it I didn't really see that this is the sort of life I wanted. I was always a novelty”.* She experienced one incident of sexual harassment which started to dominate her days at work: *“there was a series of events which sort of built and it got to the stage that God he is here again and I tried to keep out of the cabin. I tried not to be in a situation where I was on my own when he was there”.* Gillian discussed the situation with the site manager who was very supportive and agreed that she should try to resolve the situation in her own way which she preferred. She tackled the man in question and was treated in a very cold and dismissive way by him subsequently but Gillian much preferred this to his previous behaviour!

For Pauline Jenkinson, now working in a senior management role for a utility company, the interface between the labouring and the engineering staff constituted the crucial feature of site work.

“I think this thing about managing manual labour, that is the big one. I mean when I started as a graduate it was appalling. As an example the boss propositioned me and he was married and I said no thanks and then he would make snide comments all the time. I mean twenty-five years ago you didn't report things like that, they went on. By the time it became acceptable to say I will not put up with that sort of behaviour I was sufficiently senior that people didn't do it to me. The other thing that was an issue, it is funny but I think it wasn't funny as well. There were lots of girlie calendars when I first started, again not so much now and someone gave me for Christmas a Girl man of the month calendar so I thought right you know I hadn't made a thing of it but I just put my calendar up. Anyway the men were affronted and it kept being taken down and I kept putting it back up again and they just couldn't cope with this, they really couldn't, they really found it offensive”.

Pauline was clear that the general culture on site made it open season on women and despite more (as she described it) 'pc ways of working' in other professions, civil engineering, particularly on the contracting side, is still a place where women are not made to feel welcome and secure.

Connected to the 'intimidation' threat is the issue of safety which was raised by several women. The words of Wendy Legate summarise the problem:

" I was never treated very badly but there were instances where I didn't feel safe on site. I can remember that. Working late nights and being in a site hut miles away from anywhere on a road job whatever and you suddenly realise that you are the only one left with a dodgy section foreman along the corridor who has an office plastered with pornographic material, those horrible calendars and you just think 'oh! I want to get out of here'. But men don't have that kind of thing to deal with do they? I suppose my personal security was at risk. Nobody ever said to me anything outright that was discriminatory at all, but I know that has happened to some women engineers that I know very well who have been told you'll never get that job because you are a woman or you can't expect to progress any further than you have got because you are a woman or when are you leaving to have babies. I've never had anything directly that was that bad and I suppose that when you are a young engineer on site you just tend to fit in and you put a lot of effort into being one of the team. You do get used to the general culture of a site which is seeing calendars on walls".

Being pregnant and working on site was even more difficult because this just accentuated the 'difference' factor:

"I remember going to the site and saying I've got my MICE and the foreman at the time said the only letters you should have after your name are MUM and I thought thank you! I mean that is the sort of comment you get and they make a joke of it and everybody laughs but he really meant it and a lot of the jibes that women take on site are more like couched in a joke but it is there all the time".

Continuing this theme, Paula Alexander spoke at some length about her difficulties on site, which ranged from light-hearted bantering to blatant physical approaches by a Clerk of Works that made her feel really frightened. The continual obscene abuse she received from two concrete gangers also made her feel threatened to the extent that "on night shift I wouldn't go to the loo on my own". She felt that she had been unlucky and was only grateful that this experience had not put her off engineering. She pointed out that sometimes projects are very stretched and demanding which produces an intense working atmosphere; this coupled with twelve hour shifts combines to raise tension levels in a way that presents itself differently on a building site than it would in an office situation. Tempers fray and hostile exchanges occur;

already vulnerable women can be made to feel like participants in trench warfare, involving men who want women out, and women who are determined to stay.

The more subtle effects of psychological damage were present in several accounts and included the matter of professional judgement. Making mistakes in construction, though sometimes costly, is an inevitable part of the design and build process. Mistakes are made at all levels, by labourers, crafts people and design engineers. Susan Leyton described the reaction to an error she had made in some 'setting out'; she felt that this had been responded to not as normal and individual, but as proof of the gender and racial stereotypes that had supported decades of exclusion. Being respected and accepted enough to make mistakes can sometimes make an enormous difference in lessening the stress load. Mary Jones, now employed by a specialist consultancy and with considerable site experience, told me about the reaction from a site foreman when as a site deputy resident engineer she had to condemn a piece of work:

"the foreman was very surprised and I think in hindsight he came and asked me because he thought that I would just pass it and that I wouldn't know any better. He certainly didn't come and ask me to certify any more formation after that, not in person anyway".

On construction sites the behaviour of those in authority, such as the foreman representing the contractor, sets an example for the other workers to follow and openly disputing a decision can seriously undermine the credibility of any RE, but particularly a young female engineer who may feel very conspicuous. Such heightened visibility may create overwhelming pressure to perform successfully. Concluding the account of her site experience, Mary raised the practical but important issue of women's toilets. She explained that she had to share a toilet with the other assistant RE who was a man but this was infinitely preferable to having to share the other toilets with all the labouring staff. Some of the other women mentioned this problem too and not having access to clean, secure toilets was a genuine concern as part of the wider safety issue.

The subculture of construction sites was experienced by most of the women in negative ways mainly because they were often the sole woman. The pressures this brought in terms of adapting to such an isolated role have been discussed earlier and are clearly complicated by the issue of power. Most of the 'physical' and labouring work on construction sites carries low status and is almost exclusively undertaken by

men. All the women who had worked on a construction site had done so in a supervisory and professional capacity. This seemed to highlight the tension between physical strength as one form of power and professional role as another with each possessing its own subculture. Women in positions of authority on construction sites contradict stereotypical expectations and add a further dimension to an already strongly hierarchical workplace culture. Even within an ostensibly cohesive single gendered workforce (as discussed above) a complex mix of subcultures associated with class, age, education, seniority and ethnicity operate to disrupt the apparent unity and so 'fully fitting in' is a complicated business for any 'newcomer'.

4. Professional status: the role of the chartered engineer

Another very different subculture operating within the profession concerns the recognition of professional expertise arising from achieving chartered status that is seen as the key to professional progress.

The status of civil engineering is regularly debated, both in the profession and outside, by those who seek to make comparisons across the whole range of professional engineering disciplines. The NCE regularly prints comment on the subject from a wide range of contributors, some of who focus on recognition criteria such as pay, while others emphasise the essential contribution that civil engineers make in establishing the infrastructure of life as we know it. One recurring theme is the need to become chartered as a pre-requisite to being allowed to fully 'join the club'. This undoubtedly forms part of the elite subculture of the profession.

The criteria for the chartering process laid down by the ICE under the auspices of the Engineering Council are intended to ensure that engineers have sufficient knowledge and expertise in design, construction and project management so that schemes are built according to best practice principles. In short, becoming a chartered civil engineer is akin to a licence to practise.

The process of attaining chartered status has traditionally been via an accredited civil engineering degree followed by 'Training under Agreement'. This is a programme of structured training and continuing professional development supervised by an employer approved by the ICE for that purpose. The programme involves the completion of written assignments around set core objectives and the process

concludes with a one-hour interview known as the Corporate Professional Review (CPR). Usually all these stages would not be accomplished in less than four years.

In a study carried out in the mid 1990's (Watts, 1995), I looked at how this process impacted on women applicants, interviewing an equal number of men and women. The results showed that women encountered greater difficulty in completing this process, mainly because of lack of opportunity to demonstrate their project management skills. Since the 1995 study there has been a greater emphasis in the industry on the need to update skills and review new training needs. This arises in part from claims from the academic community that the industry has declining standards and is not able to attract high calibre graduates to its ranks. The views expressed by the interviewees in the present study, ranged from those who had had a very positive experience of the process to those who were so disillusioned that they had abandoned it altogether, at least as far as the ICE was concerned. All felt that they had not been denied any training opportunities they sought, and spoke only of the frustration of having to source these events themselves.

Of the thirty-one women engineers interviewed, twenty were chartered engineers and eleven were not. Of the eleven women not yet chartered, only three were not actively engaged in the process and for two of these there was actually an eligibility restriction, which would make that route inappropriate. These two (Tania Forrest and Christine Allen), however, felt that their careers were very much on track without this professional qualification and therefore they did not consider themselves disadvantaged or held back in terms of the type of work they were involved in. The other woman, Linda Cook, had a slightly different view. Her career progress had been solid and, despite not being chartered, she had achieved a high profile position within the industry in a leading policy role. However, looking to the future, she felt that if she were to get back into mainstream practice she would have to go down the chartering route as otherwise she might find herself excluded from working on the most interesting and challenging projects. Discussions with the ICE to establish a framework for the training process had not been fruitful and Linda had decided to investigate alternative ways of achieving this within other institutions that can award chartered engineer status. She characterised this very much as a secondary option but because of what she described as the ICE's 'very prescriptive' (see earlier) approach to these matters she was made to feel, as she put it, 'excluded from the club'.

Figures resulting from the spring 2001 Corporate Professional Reviews, published in the NCE (23/30 August 2001), confirm a rising trend in the pass rate, with almost eighty per cent of the 272 candidates successful. The overall pass rate has in fact been climbing steadily for five years, from sixty two per cent in 1996 to eighty per cent in 2001 (NCE, 23/30 August 2001). No gender breakdown of these figures is available. Despite increased success levels, the process continues to be questioned, in terms of its consistency, fairness and transparency. Some of the concerns documented in the NCE article echo those of several women in this study. However, the article confirms that this professional qualification continues to be regarded as essential to career progression. As evidence of this, some of the successful candidates quoted had taken the review as many as three times. Similarly, one of the messages that came across very clearly from the women interviewed for this study was the awareness within the industry of the continuing kudos of being professionally qualified.

Although the way that civil engineering is practised has changed significantly in the last twenty years (see Chapter Two), having the chartered label is perceived to be the real differentiating factor between those who have made it and those still yet to do so. The expectation that this professional qualification is in fact a requirement for recognition has a direct influence on the choice of employer (particularly whether they run an ICE approved training scheme), type of work undertaken, and opportunities to gain project management experience. The ICE, for the first time in its 183-year history, has made public the relative performance of consultants and contractors in getting their graduates through the Chartered Professional Review. Figures reported in NCE (23/30 August 2001) show that for the period from autumn 1996 to spring 2001, Ove Arup achieved a pass rate of seventy nine per cent for more than one hundred candidates. This was significantly higher than the average success rate of sixty seven per cent overall. This makes Ove Arup the greatest producer of chartered engineers, although it is only the fourth largest employer. In contrast, Maunsell, the second largest employer in the industry, achieved a seventy two per cent pass rate for the same period but had only offered fifty candidates. Thus, consideration of which employer to choose, especially in the early part of their career, was discussed by the women. Access to an ICE approved training scheme was one of the key determinants of choice. All the participants voiced strong opinions about the chartering process and those who had completed it described a variety of experiences

(some very positive), but a majority feeling that they had come up against significant difficulties which they saw as being at the heart of the *“unspoken subcultural text of the profession”* (Wanda Jessop).

Apart from the three exceptions already noted, all agreed on the absolute need to become chartered. Comments ranged from *“it was just something that you had to get as quickly as possible”* (Patricia Knight) to *“it is very important. Once you’ve got that status I think people take you as more of an engineer”* (Meena Patel). Several women indicated that it really was the first key career objective and the comment of Naomi Gill was typical: *“all I wanted to do was to try and get chartered and get that out of the way because then it is going to open up more doors for me”*.

For some women there had been a dilemma in choosing between studying for a further academic qualification and training under agreement to get chartered; a large majority was clear that becoming chartered was the priority, particularly as far as professional recognition was concerned. Susan Hamilton was very sure about her career path:

“oh! I was quite clear that getting chartered was the absolute key to proving that I was a fully fledged engineer and as I mentioned whilst Birmingham invited me to consider a further degree I wasn’t that interested and I really wanted to get on with building things and thoroughly enjoyed it so getting chartered was absolutely key to me”.

There were other reasons though to account for the decision of a majority of the women to concentrate on attaining a professional qualification and the issue of ‘study fatigue’ was raised several times. A postgraduate qualification was seen as being very much additional to their working life, part of a ‘theoretical continuum’. This would place great demands on them, so that working full-time, often long and irregular hours, particularly on site and undertaking a part-time Masters degree was not really feasible. Financing this study from meagre salaries was also cited as a difficulty. The benefits of being sponsored on an accredited training scheme were highlighted so that those projects undertaken at work could form an intrinsic part of the preparation for assessment. However, although progressing through the chartering process was seen very much as part of the every day work schedule, the associated writing of quarterly reports and essays was undertaken in their own time, in the evenings and at weekends and was not regarded as trivial. Clare Sanderson, under agreement with a contractor, commented:

“yes, I think becoming chartered is going to be of more value to me in the long run, particularly I see it as a more difficult goal to achieve than going back to university or doing a part-time course, because you very much have to have the hands-on experience and also you are more influenced by outside factors trying to become chartered. It is convincing your employer that they need to give you the experience to become chartered whereas with a PhD study or another MSc you can do it more independently off your own bat and nobody else can stop you from doing that if you want to do that”.

Four women had chosen to take a PhD straight after graduating before entering professional practice and three of these had fully funded studentships. For these women, their choice had been framed by the sense that this was an opportunity too good to miss. As an undergraduate, Molly Peters from Northern Ireland considered the option of taking a PhD and in fact did so but was not eligible for a studentship as her first degree result was disappointing. Her family supported her study and Molly felt that her eventual success would not have been possible without their practical and financial help. All four women regarded their PhD as a step in their professional careers, and all had been keen to become chartered as well. Thus, a PhD was not regarded as a substitute for a professional qualification, but rather as the completion of academic study in preparation for a career.

In Chapter Two I commented on the changing business patterns for many consulting engineers over the past twenty years, with a significant proportion of their work now being won overseas. Several of the women raised this issue within the context of how being chartered is almost an eligibility criterion for inclusion on many of these overseas jobs. Molly’s comment summarises this well:

“a lot of companies encourage it (becoming chartered) and it is important whenever you are dealing with overseas clients and people like that who really want to see that qualification but there is sort of increasing debate locally as to how much value it brings”.

The length of time required to complete the chartering process was frequently raised. For some, it had been remarkably straightforward and as brief as possible, but for several others it had been much more protracted with some difficult hurdles to negotiate. The shortest time taken was three and a half years by Pauline Jenkinson (now in a senior management position with a utility company) who achieved this at the age of twenty-five. This is the minimum age designated by the ICE, but the average age of successful candidates is now over thirty. In contrast, this had taken Fiona Kent ten years to achieve. Her determination to continue with what she had

experienced as an unnecessarily drawn out process had been driven by her conviction that this would have to be completed before she started a family. She had come across the experience of other women who had had children whilst in the midst of the process and had subsequently found it difficult to gain the opportunities necessary to complete all the designated stages. She voiced her perception that having a family might cast her in a 'less serious' light at work. Molly Peters felt that there was quite a lot of dissatisfaction amongst members about the way that the ICE conducts itself particularly in relation to chartering procedures:

“ I think there is also a feeling that the length of time it takes for a person to become qualified is quite long in comparison with other branches of engineering and bearing in mind that civil engineers are maybe at the bottom end of the salary scale, then people ask the question why is it that we have this examination procedure which seems to be more demanding than maybe other branches of engineering”.

Several women had failed their professional review the first time and in one case had to wait more than two years to sit it again. Getting to grips with changing 'rules' surrounding the process was also cited as a concern and generally there was a sense that the process was overly bureaucratic and often unnecessarily prolonged. Both Miriam McClean and Miranda Ellis referred to the need for reform of the process to give it some standardisation and to make it more straightforward and less vulnerable to the prejudices and foibles of individual reviewers.

There was some evidence to suggest that completing the process successfully was rather a lottery. Gemma Sales, who had completed the process very quickly and without difficulty, explains:

“yes my experience of it (the review) was very positive and I have subsequently sponsored someone else through his civils. He was failed for what I could see were no good reasons, so that has tarnished the image of the ICE as far as I am concerned. If they can fail someone like him then they don't know what they are doing. His references were so glowing that he should hardly have needed to go for the interview. He was that good”.

Helen Coates, who failed her review the first time but got it the second time, two years later, commented that the review seemed rather arbitrary *“the whole thing has a bit of a random element in it. You know at the interview really sometimes you hit it off with people and sometimes you don't and there is definitely an element of that in it because I did pass all the written parts”.*

The definitive part that the Corporate Professional Review (CPR) plays in the process was strongly acknowledged. The variety of experiences of this review amongst the women was interesting, not least because for several, the key factor in the process as they perceived it, was in fact their gender. The sense that they were made to feel as 'other' or 'different' in relation to the usual candidates (male) was keenly felt by some, and the less than satisfactory experience described by Miriam McClean was shared by others:

"the reviews were held in hotels at that stage. I think there were problems with room bookings or something at the Institution, so there was a lot of waiting around and you were sitting in basically a group of male candidates, which was fine really. I sort of felt slightly isolated from that point of view, but the comments that actually came when I went into my professional review such as 'isn't it nice to see a lady come to do her professional review' is the sort of thing I really didn't want to be hearing. I was there to demonstrate my professional experience, not to sort of talk about what gender I was".

Although Miriam had passed her CPR at the first attempt, she went on to describe how angry these comments made her and how she felt unable to challenge the all-male review panel, especially as there were no female reviewers available at the time. Helen Zell failed her professional interview on the first occasion and found it a very intimidating experience *"they didn't pay any attention to anything I said at the interview. They had decided before I walked in what they were going to do. They were shouting at me during the interview"*.

This sense of 'opposition' that some women faced at their review came across strongly and only one woman said that she had enjoyed the experience. There are now a small number of female reviewers on the ICE panel and one woman in this role was a participant in the research. Susan Leyton had been a reviewer for three years and had been approved for the task eighteen years after she became chartered. Her perspectives on the whole process, both from a candidate's and a reviewer's stance, focused on the need for the ICE to become more modern in its outlook and this view was held by a majority of the participants. If women are to be made to feel welcome in the profession then she claimed it is important that more of them are involved with these kinds of activities undertaken by the Institution.

The overall sense from participants is that being a chartered engineer is essential but that navigating one's way through the various stages of the process can be difficult, especially for women. In addition, the amount of time it takes to complete the process

(for one woman in this study it took ten years) can act as a disincentive to starting it in the first place. The ICE, which oversees this process for civil engineers, was seen as having its own subculture which operated in less than helpful ways bound by tangled bureaucratic structures and rigid ways of working. The women's views about the ICE generally, and not just in relation to the chartering process, are discussed in more detail in the section that follows focusing on its practice and governance.

5. The function of the ICE

A common theme of the women's comments centred on their perception of the principal role of the ICE in underpinning and reinforcing the powerful elitist culture of the profession within construction (see Chapter Two for a summary of the ICE's industry role). Their view was that it operates a mysterious and secretive subculture of its own that is resistant to change. Comments were made about the benefits of membership, its lobbying role and the extent to which the public profile of the profession is raised by its actions and campaigns. Another strongly held view centred around the perception that the ICE is a reactive and not a proactive organisation and provides the profession with very little leadership on the issues of continuing concern such as low pay, long working hours and high stress levels. This comment of Patricia Knight was typical *"I don't know of anything that it (the ICE) does to promote the profession"*.

The ICE has a regional branch structure with local associations that are intended to make it more accessible to its membership across the whole country. Some of these branches have paid officers and run regular meetings to keep members informed of new initiatives and good practice in the industry and I was therefore rather surprised to hear much criticism of its perceived 'London centredness'. Mary Jones from Scotland explained: *"I am not sure how effective their role is especially if you are remote from London. It seemed like all the interest and meetings were happening somewhere else if you like and almost always in Great George Street (ICE HQ in London)"*.

Patricia Knight from Chester said that she felt very remote from the ICE's programme of events in London. Gillian Hayes from York felt similarly, and concluded that the benefits of membership depended, to a large extent, on whether you lived in London or the South-East. The ICE is not unaware of this concern and in May 2000 opened an office in Cardiff managed by a well known senior member of the profession; this

mirrors changes to the ICE in Scotland and the opening of an office in Glasgow in March 2000. The aim of establishing these two offices is to get members involved in actively promoting the industry to the public and building up relationships with politicians in the Welsh Assembly and the Scottish Parliament to influence opinion formers and decision-makers. Presumably the other spin off will be improved and more accessible benefits for members. Fiona Kent from Oxfordshire was more positive in her view of the ICE:

“I think it’s a good Institution which provides good facilities, good courses. You know it has got a great library if you are prepared to go there and actually if you go to London. I think some of the outlying meetings are quite good but they don’t really come out to meet the members, they expect you to go there and make use of their facilities”.

Over the past few years the collection has been broadened to include books and reference material covering not just mainstream technical issues but broader social and environmental texts. This seems to be a result of the greater interdisciplinary workings of civil engineering arising from the increasing demands placed on the profession by the environmental and ‘social’ lobby for it to become more involved in the social dimension of sustainable development. Accountability in terms of safety, aesthetics, cost and environmental impacts has thus increased enormously in recent years (NCE, 30 Nov 2000).

The women’s opinions about the role of the ICE were generally contextualised within an historical framework. This is hardly surprising given the Institution’s long established constitution and traditional committee structure on which it bases its consultation with the membership. However, the array of remarks about it *“continuing to live in the past”* (Helen Coates) in fact emerged as a dominant theme. This was significant, not just because the benefits offered were not considered relevant, but also because this backward-looking approach was perceived as a disincentive for most of the women to contribute to the activities of the ICE, with a view to moving it on and modernising its image. Other factors were practical ones such as not being able to find any more time in already over-stretched schedules.

There were exceptions though, and six of the women had chosen to become more involved with the ICE so that they could try and affect some change. The degree of involvement varied, with two women participating in the decision-making of the Institution one of whom had already been a driving force in implementing policy

changes relating to equal opportunities issues. Two women explained that their decision to become actively involved arose from years of frustration with what they judged to be the ineffectual workings of the Institution. A common view expressed was that the ICE would become more dynamic if it could involve younger members in its decision-making process and also if more women were influential at the top (for instance more women becoming Council members). Susan Hamilton, Miriam McClean and Susan Leyton cited the need for a female president of the Institution. They felt that this would offer the best opportunity of reforming the ICE and this was thought by most of the women to be a more likely possibility in the next twenty years than having a female Director General (head of the ICE secretariat with considerable power). However, Karen Shaw explained that one of her medium term career goals was to assume the post of Director General and she was confident that she could achieve this within the next ten years.

Although much of the comment about the ICE was couched in negative terms, there was also some optimism on the part of Miriam McClean and Wendy Legate that positive change was on the horizon, so that the activities carried out by and for members would hold more relevance to engineers' needs.

6. Management

Management, as both practice and social construction, constitutes the final subculture of this chapter. The literature on management as a distinct subculture, discussed in Chapter Three, suggests that managers are expected to be a particular kind of person with certain attitudes and behavioural styles. One of the interview questions, therefore, explored women's attitudes towards management and specifically focused on whether this was a role they wanted to take up. Allied to this was their view about whether progression into management inevitably meant being separated from science and engineering practice. The responses to these two questions provoked a considerable mix of views, but a common thread of agreement was that recognition in the industry was dependent on two factors: whether or not you were chartered and secondly the level of management responsibility achieved.

Details of the participant profile have been outlined in the previous chapter and information about where women were positioned within the industry in terms of their management roles indicate that five women were in director/ associate director positions with a further eleven in junior/ middle/senior management posts. Only five

women had chosen not to pursue a management path. Management, therefore, appears to be a popular and necessary career route.

The term 'management' has a wide interpretation within the profession (see Chapter Two and Langford et al and Evetts in Chapter Three) and can be understood to mean project management or team management, running a department or being in charge of a discipline. Civil engineering companies often have positions designated as 'chief engineer' or 'principal scientist/principal engineer' but those appointed to these posts may have little or no line management as part of their role, which is seen more as one of 'expert trouble shooter' or 'special expert', resolving difficult technical issues.

Similarly, the role of project manager was shown to mean a variety of things, ranging from responsibility for one small aspect of a job to managing huge multidisciplinary jobs worth millions of pounds. This term, used widely in the business, is therefore not meaningful unless qualified by the detail of what the post actually entails in terms of technical skill, people management and budgetary control. One important finding was that the signifier of status and professional progression is the number of people for whom one has responsibility. So, being the company's chief engineer was a highly respected position but rather more an advisory role, and this was held in less regard than the post of division or board director, because it is within these roles that real power lies. Being in control of organisations provides the opportunity to change the policy and direction of the company and to implement one's ideas. The power to mobilise resources is integral to promoting change and this can directly determine the career development of employees within the organisation. Men continue to hold the power within the profession and several women expressed their sense of vulnerability within a culture that has as its norm the paradigm of male ways of working. These 'ways' were seen by Helen Coates as being hierarchical and all consuming.

The accounts drew attention to the fact that civil engineering is a project-dominated industry. The 'hectic' and change ridden nature of the management function was described by several of the women. Those in management functions saw a typical manager's day characterised not as one of lengthy periods of reflection and analysis, but of an endless stream of incoming information, interruptions, changing priorities, small and large crises and relentless pressure to make decisions and move on. The picture painted seemed to be almost one of chaos where unpredictability was the expectation for each day. For the engineering manager, the pressure to be effective in

a situation where nothing will stay still long enough to think about it is very demanding. The women spoke of the need for resilience in the face of setbacks and the need to appreciate that complex and challenging objectives are seldom reached without first building an effective team. This skill of team building was identified as being the key attribute for a successful engineering manager. Susan Leyton put it like this:

“team building is much harder than beginners in the art would imagine, and depends on playing to everyone’s strengths, being prepared to share both success and blame, and establishing trust. Really good teams with a strong common purpose cannot be created instantly”.

Part of being an effective manager is understanding the art of influence and taking the time and effort to win people round, this nearly always being more effective than issuing edicts. Barbara Bing Turner, an Oxford University graduate working in a specialist consultancy, made reference to this aspect. Her experience of dictatorial style management had left her feeling that the poor management practice in the industry undermines both individual careers and business performance overall. She said that she wanted to move into management because she was sure that she could do it very much better than most managers she had come across.

The person within the company to whom one reports was commented on as being another key signifier of status. The closer a manager is to the top, the more power and influence he/she is seen to have. With many consultants merging to form large multidisciplinary organisations, civil engineering in the UK has increasingly assumed a hierarchy-driven, corporate culture. Within this framework management is being recognised as a separately identified skill and not just an enhancement of the traditional technical engineering role. The changes to the UK industry that have occurred over the past ten years have produced a more globalised way of working and the demands on senior managers have become more sophisticated. One issue discussed is how engineers learn to manage and how women acquire leadership roles within this still male-dominated culture. This issue is taken up by Coyle (1989) who questions whether more women at the top will improve the position of women in general. She concludes that if decision-making power at high levels of authority can facilitate positive change in business practices, then women need to form part of management if women’s concerns are to have any hearing at all.

(i) Choosing management as career path

Although most women were clear that moving into management provided greater material reward they were not convinced that management, especially senior management, could provide career satisfaction on a day-to-day level. Several women questioned whether they really wanted to join the fray and Helen Coates explained her viewpoint thus:

“the nuts and bolts of engineering combined with a competitive almost antagonistic culture of construction contracts make an industry I think that suits men better than women in general, so I think that if women don’t go far in engineering it’s just as likely to be their choice because they recognise it’s not something that they want to be part of”.

Because women have been actively recruited into science and engineering over the past two decades and the numbers entering are on the increase, Helen’s view offers one explanation for the continued concentration of female engineers in positions of low prestige. The argument, simply stated, is that women are choosing not to pursue senior management roles and the status that comes with them. This view was not shared generally by other women, who identified the norms and expectations within the industry as being the main instruments for keeping women out of the top jobs. Some spoke of the fall-out from the business of women deciding to do other things. In the absence of retention, women will remain under-represented as senior managers and decision-makers. This meant that few of the women could think of any female role models at all within the profession and for the two or three who did, the notion of being ‘exceptional’ or ‘rare’ characterised the naming of these women.

A more general point was how engineers who prefer to remain close to the technical function could increase their pay and status without having to climb the corporate ladder; this applies equally to men and women within the profession. As Mary Jones, remarked *“so many engineers are lost to management roles”*. Does professional progress inevitably involve a move into management? This issue is mirrored in other professions such as teaching and nursing (Carpenter, 1993). Kanter (1993: 301) found in her research into corporate organisational life in the USA that some companies have established formal career paths for professionals to enable them to concentrate on their specialism without moving into management. This has provided them with the opportunity for higher pay and higher status though Kanter notes that for

engineers and scientists these dual ladders carry a suspicion that they are second-best and are often perceived as a compromise.

Only one woman spoke of 'management' as leadership in the strategic sense and I was struck generally by the limiting of this concept to projects, people and functions within a narrowly defined corporate identity. Discussion of who leads the business was missing and only five women referred to a possible role for the ICE in this context. In contrast, there was much discussion of hierarchy and departments and staff grades and titles, all pointing to a traditional 'pyramid' type reporting structure.

'Flatter' management models were not touched upon. Three women, in particular, made it clear that they had no wish to progress into a senior management position and interestingly the reasons given by each were different. Patricia Knight felt that the financial rewards were not sufficient to compensate for the stress involved. Miranda Ellis wished to remain purely on the technical side and felt that a management role would separate her from 'doing' the engineering. Tania Forrest spoke about 'life choices' and having observed that senior management inevitably meant full-time working, she was not prepared to compromise her dual role as mother and engineer by following this path. Indeed, several women were of the view that in such a male-dominated industry working full-time was an absolute necessity when it comes to demonstrating wholehearted commitment. Fiona Kent was convinced that it was her part-time working rather than her role of mother that ultimately ended her management position though it is clear that the two factors are directly connected.

These different explanations for changed working patterns all focus on the individual circumstances and preferences of the women as the major determinants of career progression. The fact that these choices had been made against a background of cultural constraint, conditioned by structured social arrangements that in essence limit what women can do when combining caring and working, was only really acknowledged by Fiona Kent with her reference to the downward career slide of the part-time worker. Certainly my findings support the last point; the women in the study holding the most senior posts of director all worked full-time. Indeed, Penny James who described her role as one of leadership made the point that: "*because I have a leadership role it means that I have to physically be here; you can't lead from somewhere else*".

Whether full-time working is a requirement for reaching the top is open to debate but the prevailing culture of the business has this as an expectation and the women's experience generally seemed to endorse this. Five women were working part-time as a response to the problems of combining work with child-care and family responsibilities. In all these cases this had been a considered change in their work regime and the shorter hours did not seem to have altered their perception of work as career rather than job. Despite this, none of the women working part-time was in a senior management position and only one had any line management responsibility at all. The position for three of these women had been different before having children; they had had middle management positions, but two had decided to change the scope of their role on returning to work part-time, and the third had had her management responsibility stripped from her on the basis that working part-time was incompatible with management. Whilst many employers, civil engineering consultants and contractors amongst them, allow or even encourage part-time work or job-sharing for lower-grade employees, they often refuse to extend such schemes to management positions; this, despite much research demonstrating how committed many part-time workers are to their jobs. In this sense part-time work is a career killer and those professionals who choose this option, even for a designated period, are regarded as having taken a step backward. Thus, the need for many women to juggle the responsibilities associated with nurturing both a career and a family is just not acknowledged or, if it is, it is then considered as the woman's problem.

This organisational resistance to embracing part-time managerial jobs runs counter to a number of organisational trends which point the way to flexible work patterns as the successful model for the future. An article in the NCE (12/19 April 2001) acknowledged that the industry was still very slow to offer job-sharing to staff, particularly those in management positions. None of the women in the study was in a job-share, and despite the fact that this is now on the increase in many other sectors, only one (Helen Coates) mentioned this either as a possibility for herself, or as part of a more general strategy for retaining staff. It is very rare to find a man and a woman sharing a management position as civil engineers, but the article uncovered a good example of this within the public sector body 'Transport for London' where the post of Assistant Director of Congestion Charging is shared. Although it can be more challenging to share a post, some positive advantages were identified such as bringing

two 'brains' to the problem and each bringing some freshness to work because they were both not there all the time. Organisations may regard job-shares as difficult to manage and this could be one reason why the profession has been slow to encourage this more. The growing problem of skills shortages in construction looks set to continue and it may be this factor more than any other which acts as the driver for change.

Research has shown that women managers are far more likely to be single and/or childless than their male colleagues (Wajcman, 1998), and my findings support this. Of the seven most highly placed women in the study, four were childless and one had adult children at university; the other two worked full-time, employing a full-time nanny to care for their young children. Combining work with child-rearing continues to be stressful for most women, and this is not helped by organisations that adopt a double standard. This means in practice that the married male manager with two children and the corresponding domestic support structure is regarded as an asset whilst the female manager with children is regarded as less committed, more distracted and a potential liability. The message for women seems to be that if you are serious about your career then having children can seriously affect your advancement. Several women commented on this difficulty, and both Miriam McClean and Penny James explained that they had indeed taken this into account and had deliberately deferred the issue of parenthood until very late and Penny reflected, with regret, that she had probably left it too late. The division between home and work is not included in explanations of men's relation to employment and their role as parents is made invisible within an uninterrupted continuum of occupational experiences (see Chapter Three). On the other hand, women's relation to paid work is defined by this division so that they may be denied opportunities to progress into management posts.

(ii) Management styles

The interview with Penny James, commercial director of a public sector research organisation, allowed me to explore the issue of leadership and management in more detail than with the other women. Penny has wide contact with contractors, consultants, researchers, academics and statutory agencies and says that her optimism about the emergence of more progressive ways of working in the industry is guarded. Collaborative approaches to management such as those more commonly seen in the housing sector, for example, do not form part of the management style within civil

engineering with this firmly rooted in the 'command and control' mode. Penny's opinion that the industry is managed by ambitious men working on the basis of self-interest first and the common good second is shared by several other participants. A common feature of this style of management is the aspect of exercising power 'over' others; an alternative model suggested by both Penny and Helen Coates would be to share power with others to create a more inclusive organisation. Penny did not foresee change coming quickly: "*there is no way it is going to change within twenty years as the dinosaurs are still there; they are controlling everything*". Penny spoke of what she described as "*feminised ways of working*" which she felt requires more women to enter the industry and reach positions of influence. The concept of critical mass is relevant in relation to the proportion of women needed to affect change. She was, however, clear that to assume an openly feminist stance was not helpful: "*to be thought of as a feminist in the construction industry would mean that you wouldn't be able to have any influence probably*".

This then raises the question of what kind of management model could replace the top-down hierarchy of power. Nearly all expressed the view that women tend to manage differently from men and characterised this style as being "*more flexible*" and "*being willing to challenge ideas and ways of doing things*". At the core of this 'difference' is their perception that women tend to consult more and are better communicators, adopting different tactics dependent on individual situations, thus making them more pragmatic. Several of the interview transcripts included narrative about particular incidents or chains of events where poor communication had itself been the problem. Ideas about how to correct this were interwoven throughout many of the accounts and included the following suggestions:

- participatory structures based on consultation
- consensual and collective decision-making
- sharing knowledge
- collaborative and not adversarial ways of working
- implementation of and not just 'lip service' to equal opportunities
- transparent reward structures
- 'amoebic' management (development of management skills within small teams which grow naturally and then subdivide)
- promoting diversity

One feature not listed above is 'fairness'. This was raised by two participants in light of their experience of female managers whom they felt acted more even-handedly than male managers, resisting the temptation to show favour and demonstrating some attachment to meritocratic ideals. As a result, their decisions drew greater respect amongst those who reported to them but this did not necessarily gain them greater status in the eyes of their superiors, all of whom, it was noted, were men. The success of a few women and perceived differences in their personal style does not change the nature of managerial power in the workplace that continues to be predicated on a male hierarchical model.

The view of most participants was that if civil engineering is to become more welcoming to women this will require those women who are already in the business to have more influence. This does not necessarily mean, however, that they will bring a distinctive female style of management to the role. My research shows that women who have achieved leading management success have done so by modifying their behaviour to fit male norms. That is, they work long hours, maintain a clear separation between home and work and present themselves as very career oriented. The stories of Karen Shaw, Susan Hamilton, Wilomena Franks and Wendy Legate illustrate the point. Several participants specifically cited this as one reason why they were deterred from taking a management path. There is thus a tension between the expectation of some participants that women will apply a more 'female' style of management within the profession and the reality of the experience of those women who have achieved promotion to senior posts on the basis of a male management model. Ironically, the continuing skills shortage and low pay may contribute to giving more women the opportunity to rise to senior industry positions, but the terms on which they can expect to succeed may have changed very little.

Being able to mobilise resources and affect change in an organisation is a function of power and, despite women's educational achievements and widespread presence in all professions (many having been the sole preserve of men), women continue to be under-represented in powerful company positions relative to their representation in the workforce. The reasons the participants gave for this as far as civil engineering is concerned were connected to industry expectations and to the need for women to recognise opportunities and operate strategically to move into the boardroom. Susan Hamilton spoke about 'self belief' which she felt most women lacked in terms of

taking up leadership roles. A strong emphasis of Susan Hamilton's account is the sense that women are caught in a cycle of 'powerlessness' because they are still such a small minority within the industry.

The experience the women had of being managed by both men and women had generally been positive and for some this had specifically contributed to their sense of being valued. In a number of cases the management had been instrumental in advancing their careers and opening up new opportunities to undertake interesting projects. With the exception of the women working in their own consultancies, all those interviewed were reporting to a male manager. The overall satisfaction with the quality of management experienced on a personal level did not preclude extensive comment about male management styles within the industry that, in general, were characterised negatively. Some contrasted these with what one woman named as the 'feminine alternative'. This highlights the marked dichotomy between the very positive and supportive management experienced generally by participants on an individual level and the criticism of management on a wider structural level that many perceived as being focused on corporate interests at the expense of individual good.

This gives rise to the question 'do women 'do' management differently?' The accounts showed that the understanding of what this might mean is very variable but a clear expectation was expressed that women *should* manage differently, with the strong implication that 'different' equals 'better' although their view was that they may compromise their success by doing so. Looking at the responses on this issue more closely, one can identify some key areas for further discussion that include: differences in management style, feminine leadership and alternative models.

Although the discourse of difference formed the underlying theme of the participants' views about how men and women manage, some cases of very aggressive female managers were reported. These women were described as being more male than the men. The assumption that women 'work' and 'manage' differently from men thus did not go unchallenged and illustrates the complexity of this issue. Attributes that are termed 'male' and 'female' do not necessarily apply to men and women individually but form the basis of stereotyping that sustains a set of gendered polarities (Ashburner, 1994).

Wilomena Franks, in her role as a company director, had attended a course on negotiation skills, and outlined some of the feedback from that which involved characterising people's working style as one of either two types. 'Blue' people tend to be very pleasant to deal with, easy going and friendly, placing a much higher emphasis on relationships than on concluding a discussion or negotiation. 'Red' people are more direct, harder edged and much more focused on the content of what is being agreed, rather than on how they are conducting the dialogue. Wilomena's assumption was that more men than women would adopt 'red' ways of working. In contrast to this assumption, she placed her own style as clearly 'red' and concluded that her career success could in part, at least, be attributed to this. However, she spoke of her surprised reaction to the findings of research presented at the end of the course that stated that those who are most successful at a senior level in business, of which the large majority is men, tend to be more 'blue' than 'red'. Her observation of management within the sector is that these types of characterisation are not fixed, so that people may change and adapt their style over time. Becoming a manager and gaining seniority involves stages of progression, each of which may require different styles. All the participants spoke of the constant need to prove their competence to earn recognition and acceptance by both their peer group and management. For those climbing the hierarchy ladder, the perception might be (as was the case with Wilomena) that it is necessary to reject a distinctive feminine mode in favour of a conventional clear-cut, uncompromising approach. Thus, it is only when you are nearing the top of the ladder that you can become more interactive and consensual and less individualistic. This strategy could be labelled 'playing them at their own game'. Wilomena described this process:

"I learned that there is probably a sort of ideal route at the moment through the company where you are very 'red' and you become progressively 'bluer' and then you are recognised as being somebody who handles relationships and difficult issues very well without creating waves and without being too harsh".

I posed the question to Wilomena whether it is possible to have both sets of attributes or whether they are mutually exclusive. Her view was that everyone has both, it is just that the balance changes in response to particular circumstances or challenges. She was clear though that as a female civil engineer the effects of emphasising process rather than results may not be good for one's career: *"I can certainly think of a couple*

of women who are quite 'blue' and I think that they are fine as engineers but they just don't sort of cut a very clear profile anywhere and I think they suffer because of it".

The suggestion that women may have different attributes to men, and that this could work in their favour, received some attention from three women in the study. Wendy Johnson, for instance, explained that she was in no doubt that her gender had worked for her rather than against her: *"in some places it (being a woman) has actually been a considerable advantage. I think I got more out of the site staff than a man in the same position would have got"*.

This comment referred to the issue of being a good communicator, which is an essential management tool. Wendy was about to be appointed to the post of main board director at the time of our meeting and she put her personal success down to her good communication skills and 'being noticed' and also being prepared to listen. *"I got remembered by a lot of people just because I was the woman there. In fact, I might have been the only one on many occasions, the honorary man"*. Wendy's individual success mirrors that of other participants who spoke of their understanding of why they had achieved what they had, derived from a different perspective entirely. Their view centred on having to demonstrate to their senior colleagues that skills more generally associated with women such as communication and networking (making connections with both people and information) have a business value as well as a social value. The fact that women are not represented in greater numbers in the higher ranks of the profession can, in part, be explained by the cost, both in terms of time and energy, of this process of tacit persuasion.

A remark that I found both perceptive and amusing came from Susan Leyton. This was said almost jokingly, off the record, after the interview as she walked me back to the main entrance of her office building. She said:

"you know how men can only do one thing at a time, well it amazes me how they manage to remain so powerful in this business when multi-tasking is really important now. Women are bound to be better at this because so many of us know nothing else! Juggle work, children, study, the lot. Endlessly. It's almost like second nature. Where would we be if we only had to concentrate on one thing?"

This remark further illustrates that women participate in the labour force on very different terms from men and this applies across the board to include professional women and unskilled women. Some of the other women referred to ways of incorporating this feature of so many women's lives into a 'career plus' or a positive

differentiator. Victoria Joseph adopted this approach when she was being interviewed for a senior management post. Asked how she could demonstrate her management ability she responded:

“well my children have always turned up at the right place at the right time with the right kit and so have I. And he didn't know what I was meaning. You looked at him and he didn't know what I meant and I thought well you have just never tried doing that”.

She got the job. What is interesting about this account is that Victoria had encountered opposition to her chosen career from all quarters; from her family, her school and her peer group. As a result, she had expected to meet problems and her coping strategy could be summed up by her keeping in mind that she had nothing to lose and making the most of opportunities. Victoria had made the discourse of 'difference' a positive attribute and her advice to other women was to do similarly:

“you have got to look at the different skills that women are coming in with which isn't reflected in a standard CV and I feel that there is a lot of opportunity there to have a more balanced viewpoint at the top of a firm. A broader range. If you look at a group of people you see a whole spectrum of interest, but I do feel groups at the top of any organisation ought to reflect the membership of that organisation whether that's the Institution, whether it is a company or whether it is a country”.

(iii) What does success look like?

Both Terri Apter (1993) and Carole Pateman (1988) have provided a comprehensive critique of the gender relations of employment, taking the interface between the private realm of the home and the public world of work as the theme of their analysis. Men generally enter the workplace unfettered by domestic responsibilities whilst women are assumed to give a higher priority to these responsibilities over the demands of their career. The underlying assumption prevails that men will have wives or partners to support them at home and reproduce the family whilst professional women, no matter what support structures or arrangements are in place at home, are perceived to be compromised by the dual identity of worker and carer. This particularly applies to women seeking senior management positions, because their availability to fulfil all the demands of the position of director or chief executive is silently, if not overtly, questioned. There is much in the literature on the subject of the 'career wife' and the benefits that accrue to their husbands from having a dependent and available partner to enhance their corporate standing (Folbre, 1994; Williams, 2000). This it seems is the 'ideal' partnership based on the housewife/breadwinner marriage model. The participants' accounts indicate that civil engineering remains

very traditional, with this kind of family arrangement at its centre (particularly amongst managers) and several women identified this 'norm' as another way of excluding women. Pauline Jenkinson commented on her experience of the ex-patriot civil engineering community whilst working as a project director in South East Asia. She was unaccompanied and found that she was isolated socially because activities were family based and it was assumed that the wives of the other engineers would socialise and form friendships which would underpin their time there. The reality was that there was no place in the picture for a single senior level female engineer. Pauline comments:

“one of the big issues for women working overseas is that it is a lot more difficult to find a man who would be prepared to accompany you than it would be for a man to find a woman. I think that's an issue and there is absolutely no appreciation of it by men whatsoever. Men have this big advantage that women don't have called a wife and I have to admit with this new job I am seriously considering advertising for a housekeeper”.

The dominant reality from the corporate perspective suggests that a successful manager comes with a package of attributes such as stability, unconstrained availability and a fully supportive partner. It is not difficult to see how the married man, with a family and his dependent wife who concentrates on 'nurturing', so easily fits the bill. There is no doubt that this forms part of the standard or ideal manager type within corporate culture where firms gain the benefit of the unpaid labour of managers' wives. Women striving for this type of success have to compete against this 'ideal' or 'norm' and many referred to this issue and how equal opportunities did not form part of mainstream practice in the industry. One participant described how she had been asked what she regarded as inappropriate questions at an interview for a senior management post. These revolved around issues of her future family intentions and around existing caring responsibilities. She was convinced that a male candidate would not have been asked the same questions. Men and women do not start from an equal position.

One of the key themes which emerged from the interviews with the seven most successful, or most highly placed women (five in director posts and two in their own consultancy practices) was the strength of their commitment to their careers. All described their profession as integral to their identity and claimed that work had always taken priority in their lives. There were shades of difference in degree between those who had children and those who did not, but they all spoke about the vision they

had for themselves, which to a greater part was centred on the investment that each had made to their career. The centrality of work to their lives did not negate the importance of other roles within family and wider social networks, but these had to be managed to fit in with work responsibilities. Perhaps with the exception of Victoria Joseph who spoke about career stages and the need to be flexible to take account of change and transition in one's personal life, I was struck by the male pattern of progression that these women portrayed, i.e. fast track, full-time, as uninterrupted as possible and totally committed.

Despite the advances that women have made in the world of work, many women are actively questioning the values of the corporate world and voting with their feet, leaving large organisations in favour of a less certain but more rewarding self-employed lifestyle. Indeed, three women in the study had chosen this route. In one case (Victoria Joseph) this was to ensure a more flexible work pattern that would accommodate raising a family, but in the other two cases (Susan Hamilton and Wanda Jessop) it was a move rejecting the competitive nature of corporate culture. In this instance, the requirement, as a single woman, for financial security was very much less important than the need to create a more balanced life where work was not everything. Victoria's view was that even where women succeed in engineering, they cannot transform the culture within which it operates. Although the approach to career that emphasises work to the exclusion of everything else is now being questioned, ideologically it seems that these values continue to be powerful and provide the 'norm' or the benchmark for success. Women, therefore, understandably feel that they have to prove themselves within this framework and on these terms. By and large, then, this is what success still looks like.

7. Conclusion

The issues discussed in this chapter characterise the profession as slow to change its cultural base despite pressures to adapt business practices in response to technological advances and the demands of globalisation. In particular, the culture and image of the ICE were characterised as forces acting in a counter direction to change and modernisation and were seen as actually retarding the process of change through maintenance of what participants termed as rigid and old-fashioned practices. This kind of change suggests a macro perspective that most women found difficult to engage with, particularly in relation to specific reforms. Their perspective was more

keenly focused on the micro level, on their own situation within their particular company. This was to be expected and arose, in part, from the nature of the interview schedule which directed participants to reflect on individual experience. Most of the participants appeared to be resigned to the underlying adversarial nature of the industry and their energies, generally, were directed at negotiating this type of culture within their specific organisations rather than actively trying to change it on a wider level.

Despite the personal perspective of individual accounts, working long hours emerged as a common theme and this seems to be established as a deep-rooted subculture within the industry. Some women, though, are choosing to reject this as the dominant model and strategies for creating work/life balance are discussed in the next chapter.

CHAPTER SEVEN

WORK/LIFE BALANCE

1. Introduction

The concept of work/life balance covers a range of issues including time spent at work, volume of work, organisational expectations, workplace culture, job satisfaction and life outside work that may involve caring responsibilities, hobbies, sports interests and public office/voluntary roles. Two themes have emerged from the research that appear particularly significant: the first concentrates on the amount of time spent at work in relation to the long hours culture within civil engineering and how responses to this can impact on career progression and, the second considers ways of managing the boundary between work and family.

This chapter considers the psychological and physical consequences of juggling work and other commitments but also discusses whether there are any positive consequences associated with this. Coping with multiple roles presents individuals with competing demands on their time and energy and the interviewees considered these conflicts both in terms of daily traumas and occurrences (for example, the sick child who cannot attend school) and also as a longer term strategic issue in relation to quality of life. Some women discussed the concept more as lifestyle choice and saw this not only as a woman's issue but also as a human issue questioning traditional definitions of 'career' and 'success'. Overall it is important to note that work/life balance was discussed mainly in terms of the extent to which work interferes with family and leisure rather than the extent to which family interferes with work. This reflects the emphasis of most research in this area (Thompson & Beauvais, 2000).

For many women the critical problem of work/life balance centred on the issue of working long hours and for some this involved stints overseas. The perceived requirement to be completely flexible and available to stay late in the office, travel to meetings around the country and abroad, often at short notice, was experienced by some as very stressful. This is therefore the focus of the first part of the chapter. The second section is concerned with work/family conflict and discusses strategies for resolving this and looks particularly at the experience of part-time working. The last two sections of this chapter concentrate on the particular types of pressures identified by the participants

and on approaches they adopted to deal with these. The way that boundaries between work and non-work roles are negotiated and maintained form part of this discussion.

2. Long hours culture

Despite technological advance within construction, the sector is still underpinned by a work pattern characterised by long and unsociable hours; this applies equally to UK and overseas projects (Langford et al, 1995). The problems associated with the long hours culture within the profession that produces a climate of 'presenteeism' has been discussed in the previous chapter and this factor appears to particularly affect the ability to find a satisfactory balance between work, leisure and family time.

There is wide reference to this issue in the literature (see Chapter Three) and the topic receives much attention in the media in a variety of connections. Workers in the UK work longer hours than those in any other EU country, with the average male working a forty-seven-hour week (Guardian, 16 January 2001). The letters page of the NCE regularly includes contributions on this issue from both men and women questioning whether it really is necessary for civil engineers to work sixty and seventy hour weeks as the norm. A majority of the women in the study working full-time indicated that they worked far longer than their contracted hours and often found that they had to take work home just, as one woman put it, to "*keep up*". Wilomena Franks, in her position as a director, said that she generally worked a fifty hour week and Miriam McClean, also a company director, spoke similarly. Wendy Johnson, chief engineer of a large consultant, said that one outcome of her recent separation from her husband was that she could return to concentrating on work. Although she disapproved of long hours she felt that the change in her personal circumstances allowed her to work late if necessary and not feel guilty about it. She said she almost felt a sense of relief that the conflict between her career and home life had now been removed though a reduction in stress had been replaced by an increased loneliness. The degree to which her marriage had suffered as a result of her focus on her career was unclear, but the fact that their roles had become very different, with her husband taking early retirement and her working full-time in a senior position, was one reason she offered to explain the change in her personal circumstances. This suggested that in Wendy's case it had in fact been family circumstances that had interfered with work and this was the only such example in the research. She confided that she had just been informed of her forthcoming appointment as a director and she was looking forward to her new role. When I asked her whether

she thought that her promotion was due in any way to the greater efforts she had been making in her job since her separation, she responded by saying that her instinct was that the two were not unconnected. She could once again be seen as a single-minded career woman without distractions.

All the women in the study were open about the long hours culture within the profession and the expectation of senior managers that they would stay as long as it took to finish the job. Some spoke of their experience of working sixty to seventy hours a week on a regular basis. One participant, Meena Patel, described how she had worked through the night to get a bid ready for the courier at nine the next morning and, having met this deadline, she donned her coat to go home (exhausted) but was halted in her tracks by her boss asking “*where do you think you are going?*” Whilst this incident may not be typical, it demonstrates how ‘winning work’, and the strains this can place on employees, is a constant focus for managers with repercussions for staff at all levels.

All the women commented that there was an unspoken understanding within the industry that civil engineering was not nine to five work. Problems on jobs, delays in schedules, weather difficulties, a greater number of overseas clients and better developed consultation processes, all combined to require flexibility of the modern civil engineer. The way that the word ‘flexibility’ was used implied, in the main, an availability and willingness to stay at work as long as necessary and those who could not conform to this expectation were regarded in a lesser light. Susan Leyton, who works as a principal chartered engineer for a mainstream consultant, commented “*you are expected to be flexible, if the job needs to be done to meet a deadline people will stay on and do it*”. Susan, though, regarded this very much as a quid pro quo arrangement, and was keen to point out that ‘accruing’ hours meant that on some days she could leave early to do ‘family’ things, so some flexibility in working hours was in fact advantageous provided the ‘pay back’ was claimed. She was the only woman to explicitly mention ‘taking back’ hours for herself as a way of trying to improve work/life balance.

The issue of the long hours culture was as relevant for single women without family commitments as this interfered with other aspects of life. These women spoke about a range of interests and leisure pursuits that they enjoyed but making a commitment to any of these on a regular basis was regarded as problematic by the majority. Three participants had moved from their family homes in Scotland to the South-East and in

each case they remarked how difficult it was to plan visits 'home' because of regular weekend working. There was general comment about the expectation that weekend working had become part of the culture of construction. Naomi Gill explained that this was regarded as necessary to "*get jobs through*" and that because of this expectation, the management was reluctant to make additional payments to professional staff who worked at weekends.

The discussions on this topic highlighted a number of interesting features and two particularly stand out: firstly, poor project management of jobs often leading to crisis situations which could not wait until the next day for action and secondly, the need to be 'seen' to be at work at least as long as the boss. The culture of 'presenteeism' in the industry was regarded as widespread and affected women more disproportionately because of the primacy of other roles in their lives. As Helen Coates put it "*being there and being seen to be there is everything*". Helen did not have a family or any other caring responsibilities, but the emphasis of her comments on this aspect of civil engineering revolved around caring for herself to ensure that she had enough energy to enjoy her leisure time:

"there is definitely a culture of long working hours and I can remember saying to one of our directors that it was my ambition to have a job-share and his reaction to that was that we obviously haven't inspired you with engineering. I said that's not really the point. You know we are supposed to live in an age where it is not necessary for everybody to work all the time any more. Isn't it better that more people should be working a reasonable amount of time and enjoying themselves outside work as well, rather than having people who are working sixty hour weeks? Since I have been with – it has been noticeable that people work longer hours on a regular basis".

This was particularly problematic for Meena Patel, who spoke of her forthcoming marriage and expressed some concern about how her career might be affected by her new status. She felt that there were cultural constraints that would make site working, for instance, more difficult for her. The family she was marrying into would not find her working on a construction site an acceptable role for a married Asian woman. Also, working in the office late in the evening alongside mainly male colleagues would be questioned. Meena was the youngest woman in the study and already had quite a responsible position that she found enjoyable and demanding.

"I do find that I stay long hours. I have been here until eleven in the evening. I've been here until one in the morning doing tenders because they have got to be in by the next morning, no ifs, no buts. You are presumed, you are not asked. It is presumed that you will stay. Everyone here is male, those who stay behind, and when they get home their

dinner is already in the oven; they don't have to think of anything else. Whereas I had to think, oh my God how am I going to get home? Is it safe for me to get home? I've got to go home and cook still. I don't think that men have that sort of responsibility. Everyone just assumes that you are going to stay and finish what you have started".

I was struck by the enthusiasm Meena had for her work. *"I absolutely love working"* she told me, but the prospect of having a family was already starting to worry her because she felt that civil engineering and children just do not mix. *"How will I work and care?"* she wondered. Part of her concern related to her belief that part-time working is not really an option and the long hours as the norm militate against this as a practical possibility. A dearth of women who have successfully combined mothering and working was commented on: *"every woman engineer that I know of doesn't have children yet"*.

Management quality within the profession was commented upon by several participants, particularly within the context of effective working practices which themselves impact strongly on how jobs are carried out and how long they take to complete. It was stressed that if contracts were managed better, then last minute panics and long evenings could be avoided. Barbara Bing Turner saw this as a critical aspect of her experience:

"I think that within the civil engineering industry, management is not something that is done particularly well and I have come to many scenarios where I suppose I haven't been managed properly in that the management distanced themselves, I am sure due to work overload. So often projects go wrong as a result of that or aren't kept on track as a result of that".

Linda Cook, working in a high profile leadership role within the profession, expanded on this theme:

"I think a lot of the hours we have to put in are because we 'fire fight'. If we took more time in planning and thinking through the process in working together as a team we would cut out a lot of the duplication. There is an awful lot of wasted effort that we put in because we are covering our backs and this is not actually adding value to the product at the end of the day".

This is due, in part, to a blame culture that still operates in the profession; the freedom to make mistakes does not generally exist as part of the ethos of the industry. Some differences in parts of the profession were identified, and Molly Peters moved from a leading engineering consultant into academia, mainly because of her low quality of life, which she saw as being caused by the constant demands of long hours in the office.

"I was working extremely long hours and had been doing so for quite a long time and came to realise that with –, or for that matter any other engineering consultant, the competitive nature of the industry is such that there would be no choice but to put in

those long hours. So I don't put that down to any one employer, it is just the nature of the industry, because I know from talking to people in other firms that they feel the same way. I personally wanted to cut back to what I considered to be a more reasonable working week. I moved to my current position not because I had any big desire to work in academic life at all but because I felt that it would offer a change, an improvement".

Molly indicated that although the rigours of academic life are not dissimilar to working for a consultant, she felt that she had more flexibility and that her work/life balance had improved as a result. The issue of working long hours on a regular basis is connected to quantity and quality of output and several women made this connection. Wendy Johnson's view was clear: *"People do work long hours. There are particular people who work very long hours and there are others that don't. I must admit I am not one of the ones that work very long hours. My output drops if I work very long hours"*.

She and others spoke about the stigma attached to working sensible hours and identified herself as someone who could act as a role model for working in a focused and efficient way within the contracted hours. *"I think it has got to be accepted that you are not shirking if you go home at the right time, provided that you are actually producing work and the quality is OK"*. Wendy had been prepared to risk being thought of as a less valued member of staff: *"I decided that enough was enough, there was more to life"*. Her approach to balancing home and work responsibilities had not seemed to impede her progress though she did feel that she was entering a more work-dominated phase of her life as retirement approached.

Looking at civil engineering as a whole including both the contracting and the consulting communities, there is no doubt that working long hours, particularly on site, is strongly connected to the issue of pay. Most professional civil engineers, especially at the middle and senior levels, would not expect to receive extra pay for working longer than their contracted hours. This of course is much the same in other professions such as teaching, medicine and the law. However, there is an expectation amongst the contracting staff that overtime will be available on a regular basis and that this will be paid often at time and a half and is regarded almost as an entitlement. Even with the new European working time directive that stipulates a maximum forty-eight-hour week, there is still pressure on management from site staff to ignore this legislation and continue with the old pattern of long days and regular weekend working. The concept of 'flexibility' in the workplace has thus assumed a dual meaning: as part of male culture this is interpreted as working longer hours or 'overtime' but in female culture this is

seen as working part-time. Trying to change this culture is obviously going to be difficult, because site staff want the extra money paid at overtime rates, but some contractors are starting to implement changed policies.

Wendy Legate, a director of a large contractor, spoke at length about the business of trying to bring about a fundamental shift in attitude towards this issue. She was clear that unless there is a demonstrated commitment from the top to work sensible hours, there would never be any change further down the industry.

“There will always be, I am convinced of it because I have spoken to them, workaholics. Men who will work daft hours and they will get to work early, they won’t leave the office until nine at night and what we are trying to get over to those people is that that is an example they are setting. So if the regional directors are working those hours that is the example they are setting for their senior management and everybody else who works in the office, because if they know that the senior guy is there until nine o’clock well they think, oh better do that. So it is an ongoing target of ours to reduce hours”.

Wendy was convinced about the underlying reason for this attitude:

“I have my own little theory that it is all a male macho thing and you know who is in the office last. And from where I come from, somebody who works all those hours produces in my eyes the same as somebody who is working nine until five. I don’t see any difference in the output”.

Clearly though, this view is not widely held across the industry which maintains the culture of long working hours as part of its mythology (Langford et al, 1995:194). Occupational and professional identity constitute a vital aspect of ‘self’ for most men and the degree to which they progress at work contributes to their sense of self worth. Working longer and harder, it seems, is an intrinsic part of career development and for men, marriage and parenthood in no way contradict these career expectations. Thus, stereotypes continue to be powerful with men defined by their work whilst women are expected to look to other roles to complete their sense of ‘self’. For women who seek to pursue careers, particularly in male-dominated professions, there may be no complementarity between work, career and family but rather a sense of heightened conflict between these different aspects of life. Many of the participants made this point specifically in relation to their attempts to maintain credibility in their professional role whilst at the same time trying to ensure time and energy for their family life.

The culture of achievement within the profession was seen by some interviewees to be confused with the long hours syndrome. Wilomena Franks commented that: *“I don’t think there is a culture of long working hours but there is a culture of people pushing*

themselves very hard to achieve what they want to achieve or what they think is expected of them as a product and people will work very long hours to get there”.

On this topic, Wilomena told me that just a year before she had been working about seventy hours a week for quite a long stretch. This had had a detrimental impact on her family life and it was unlikely that she would allow the same situation to occur again. Her normal working pattern, as a company director, had settled down to roughly fifty hours a week. This in fact seemed to be about what constituted the average for most of the women, but there was an acknowledgement by them all that this could increase with peaks occurring on particular projects. Thus, although there was criticism of ‘*male ways of working*’ as one woman described it, with long hours being a principal feature, virtually all the women working full-time were in fact adopting the same model. This seemed to be an essential requirement for being accepted and feeling comfortable with colleagues. The only exceptions were those working part-time and even then, as Patricia Knight commented, it felt necessary to take work home. It seems from the data that it is virtually impossible to avoid this practice.

3 Overseas working

Chapter Two described how civil engineering has increasingly become a global business, with many of the larger UK consultants having opened offices throughout the world in an attempt to secure the best possible share of large scale infrastructure projects, particularly in Asia. The emphasis on the UK market has continued to decline, resulting in many engineers having to work abroad for varying periods of time. This change has opened up possibilities for some and posed problems for others. Even where work does not require medium or long-term relocation, there is increasingly a requirement to travel and this can be very disruptive for engineers and their families and can impact negatively on work/life balance. Underpinning this change in the industry is the associated assumption by employers that their technical staff will have an unrestricted availability to travel, often at very short notice. Being available to move from one site to another, from one area of the country to another and from one country to another is regarded as a valuable attribute for success. This is a problem for many women and had posed difficulties for several participants.

Fiona Kent and Tania Forrest, both with young children, described how extensive detailed domestic planning was absolutely essential before any overseas trip and that the key to this was adequate warning which, they both agreed, was not always possible or

sufficient. Both women spoke about the stress they experienced as a result of having to put what Tania Forrest described as the “*home management*” in place before travelling abroad and how, as a result, they had taken a conscious decision to “*not get involved in overseas projects*” wherever possible. Fiona Kent commented on the issue of the uncertain duration of overseas trips. She explained that this was related to a number of factors including local weather conditions, project progress and problems with contracts and equipment.

Even for women with no caring commitments who would like the opportunity of working on overseas projects, their gender may stand in the way of their perceived suitability for this work and several participants described how this had indeed characterised their experience. Evetts (1996) found that expectations of employers with regard to the willingness of engineers and scientists to relocate were clearly gender differentiated. Helen Zell commented that she was sure that she had been “*overlooked*”, as she put it, for a number of overseas assignments despite having sufficient project experience and the relevant expertise. She felt that only her gender could account for this.

The problems for women engineers working in Asia and Africa were discussed by several interviewees, who felt that the cultural barriers to their presence were sometimes overwhelming. Particular difficulties were identified in relation to some Muslim countries, with Pakistan singled out for special comment. The increasing fundamentalism of some Muslim countries emerged as an important issue for the future, as far as women being able to work alongside male colleagues, was concerned. Some countries were described as being ‘closed’ to western professional women and this was therefore potentially a limiting factor for women’s careers, especially for those wishing to concentrate in the water and irrigation field. There was a degree of resignation to the situation expressed by a majority of the interviewees though it was clear that for some being denied the opportunity of working on some of the largest and most interesting infrastructure projects was a disappointment. There was one dissenting view from Wendy Johnson. She claimed that women working on overseas engineering projects were still unusual and as a result she felt that their views were listened to. In this context she considered her gender an advantage. This minority opinion in fact supports the anecdotal evidence offered by Takahashi (2000) who found that women executives working abroad possess a competitive edge over men because of their visibility.

For a few participants the issue of travelling away from home regularly, both within the UK and abroad, had assumed a central focus in their efforts to achieve work/life balance. It had caused Tania Forrest, for example, to reconsider her career plans. This had resulted in her move to a more office-based role. This type of choice was regarded by some as a necessary compromise to accommodate family responsibilities but not as a demotion, whilst others saw this change very much as a career halt. What is clear is that for women working overseas, particularly in developing countries, there are structural and personal problems that can directly affect their progress and their performance in the job. These factors are complex and interact on a number of levels to affect recruitment, promotion and job satisfaction. Integral to these factors is the assumption that it is women who give care to families and dependants in the private sphere of the home and it is this role that limits their opportunity and performance in the public sphere.

Connected to the culture of long working hours and frequent trips away from home was concern over how to balance work, caring, personal development and leisure in a pattern that would bring quality of life. Issues linked to running a home and maintaining family life were also commented upon with some women finding that even with well organised domestic help their work continued when they got home for as Oakley (1997: 43) points out '*when domestic roles and tasks are gendered, women do most of the work*'. So for many participants, especially (though not exclusively) those with young children, the critical question was how to achieve a balance between a fulfilled career and a range of personal roles as friends, partners, wives, mothers and daughters.

4. Work/family conflict

Many interviewees were balancing career and family roles at an age when male colleagues were devoting more and more time to work and taking advantage of interesting and challenging work opportunities unconstrained by their role as parents. In fact, when men become fathers there is evidence that they spend longer at work either to make up for some loss of income from the mother or to escape to the relative 'calm' of the workplace (Figes, 1994: 93). The culture of working long hours discussed above is therefore relatively unaffected by the advent of fatherhood. Some women were themselves also following this model of success which leads to even more time at work but others had reviewed their work pattern and had made changes to reflect lifestyle preferences as well as parenting responsibilities. For those participants balancing the

role of engineer and mother, the issue of work/life balance assumed the primary focus of work/family conflict (Thompson & Beauvais, 2000) and this section discusses parenthood and part-time working as particular features of this paradigm.

The degree to which other roles that women may have (being a mother for example) are visible in the workplace, and the impact this may have on their credibility, was the subject of extensive comment. Many suggested that there was reasonably equal treatment between men and women until women became pregnant, so that motherhood was seen as a key differential in a way that fatherhood was not. The notion that motherhood is often associated with a change in working arrangements, notably a shift to part-time working, was commented upon, because the organisational structure of most civil engineering consultants is such that those seeking a managerial career are locked into traditional, inflexible working practices. Working part-time or taking extended leave to care for dependants is not a viable option if a woman (or man) seeks to move up the company hierarchy. This finding is reflected in research carried out by Cockburn (1991:96) into the employment practices of a government department. The essence of some of the accounts from Cockburn's study was that motherhood, particularly working motherhood, is punished in the workplace and the impacts are felt by all women because just the 'threat' of motherhood is enough to cast women in a less serious light when it comes to their careers. This contradicts the views of participants in my research who felt that generally they had had similar opportunities as male peers to progress up until the time they became pregnant. At that point, they said that they had become aware of changed attitudes towards them by their managers and other senior colleagues. Fiona Kent and Susan Leyton both recounted specific events that had occurred not long after they had informed their employers of their pregnancies. These occurrences suggested they were being marginalised or as Fiona put it "*gradually removed*" from the decision-making arena. A report entitled "Birth Rights" published by the National Association of Citizens Advice Bureaux (2001) found that thousands of women are still sacked illegally because they are pregnant and many are also threatened with dismissal. This confirms the findings of the Equal Opportunities Commission (2001) whose research into pay and promotion found that "*the biggest factor which adversely affects women's promotion prospects, or at least the prospects for women of child-bearing age, is the fear they will fall pregnant*".

The assumption still prevails that all women have a natural proclivity towards motherhood and caring. Whilst pregnancy and motherhood are still feted by society, they are viewed negatively by the majority of employers, in terms of financial cost and organisational disruption. This may be understandable given the practical arrangements and accommodations that employers and employees have to make in order to provide the necessary 'cover' for women on maternity leave or longer term career breaks. However, the issue is much broader and is linked to the different values we place on the respective jobs that men and women do. The perception that childcare is 'women's work' and a private and individual responsibility, rather than a social concern, lies at the heart of the issue. An essential component of the assumption is that even in a two-parent family, it will be the mothers who have the principal caring role and that their careers will be of lesser importance than those of their male partners. Whether this effect is more pronounced in a mainly privatised and male-dominated profession is uncertain, though, when Melinda Jackson explained that she was plucking up courage to inform her employer that she was four months pregnant, and would be the first woman in the company to seek maternity leave, I reflected that this would not be the case for a teacher, a nurse or a social worker, these professions being mainly located in the public sector.

The issue of 'visibility' was raised in a number of guises, but particularly in relation to part-time working. Tania Forrest, who works part-time, alluded to this: *"I suppose women are seen differently if they are part-time because you know it's realised that they have other roles to play"*. The visibility issue can be seen as part of the culture of 'presenteeism' that favours the majority who are full-time workers. Cohn (2000:168) refers to visibility as one of the twenty-six things to remember about discrimination; *"workers who stand out rise quickly if they are successful all the time, but their conspicuousness insures dramatic punishment for failure"*. Where this leaves those who work part-time and have to deliver similar outcomes in a competitive, results-driven environment is unclear though several women in the study were sure that the stress of this option would be overwhelming and they had deliberately chosen, as they saw it, not to compromise their position by working part-time. Overall, part-time working was seen as a more significant factor in the image and success stakes than either personal appearance or dress code. Connected to the issue of networking, it is more difficult for part-time workers to advance their careers via the 'who you know' model, because they

are not there all the time to be certain of who they need to know. Because more women than men work part-time their careers are therefore adversely affected to a greater extent than those of male colleagues.

There were variations in the participants' experiences as part-time workers. Of the thirty-one women engineers interviewed only six were working part-time; in five cases they had chosen to do this to combine the labour of caring for young children with their professional work. In the case of the remaining part-timer Susan Hamilton, working less than full-time was a conscious choice to have a different work life balance: she has no caring responsibilities. Patricia Knight's experience of working part-time since the birth of her children had been that her status had not been compromised by motherhood and the consequent reduction in her working hours. She was very clear about this and spoke with enthusiasm about the projects she was working on and the flexibility afforded her by her employer. However, although her organisational status had not been impaired by her change to part-time working she did feel that she was assigned "*less exciting work*" and regarded these projects as less challenging. She felt that she benefited from having her children when she was already well established with the company and had risen to a senior management position though she had decided not to seek further promotion and had placed her career 'on hold'. She also felt that women could not be discussed as a type within the profession but were seen as individuals and perception of performance was not overly influenced by gender. In contrast, Fiona Kent had experienced work post motherhood as a struggle, resulting in her leaving her employer. She felt that she had suffered direct discrimination because, although it had been agreed that she could work part-time and retain her management responsibilities, in practice because of the way the company organised meetings and line management functions, it gradually became impossible for Fiona to do her job on the agreed three days a week. The picture she painted was one of an undercurrent of conflict with her employer:

"I think there were some real practical difficulties. If I had been prepared to say employ a nanny and leave the house at half past seven and get back at seven and for the nanny to get the children up so basically I would just see the children at weekends then probably it would have worked. If I had been prepared to go away to meetings like I used to and get back at nine o'clock. But I think I was fairly honest and said I am not prepared to do that. I need quite a bit of notice if you want me to go to meetings so that I can get cover for the children. They just weren't flexible to do that. So the message that they got from me was that Fiona is not prepared to do those things whereas the message I was trying to get across was I need some more notice and I can't drop everything necessarily and go to a meeting tomorrow in Scotland".

Fiona's disillusion with her employer, following the change in her working pattern, stemmed not just from her individual treatment but from broader implications.

"I think I feel particularly let down because I was told when I initially wanted to go part-time that that was fine and that the company really wanted it to work because they wanted to be able to prove to women younger than me that you could have children and have a career".

Fiona appeared to be still traumatised by the discrimination she had encountered and when we met, she explained that she had decided to do some self-employed consultancy and return to part-time postgraduate study, which would allow her to create a better balance between her home and professional life. This pattern is not uncommon, but for those women whose incomes are essential to the family budget, this can be a precarious path to tread, not least because some women, on becoming mothers, experience a loss of confidence in their professional abilities.

Gemma Sales returned to work twenty-nine weeks after the birth of her son, working two days per week in a new role that had been created for her. Although different from the project managing she had been doing previously, she was enjoying the challenge of her new position which carried high status and considerable responsibility. She did hint at compromise, in that her current post was not as exciting or demanding as that which she had held prior to her maternity leave, but she was very clear that this was a price worth paying for the opportunity to have time with her son. In this respect she regarded her present work as an investment for the future, when she saw herself eventually resuming full-time work. Gemma's experience of combining part-time working with motherhood, like Patricia Knight's, had been positive and their accounts were imbued with the sense that they had been in control of their situation and had been able to negotiate packages that suited them. This clearly stemmed from their being valued by their employers, so that they could demonstrate their individual worth. Fiona Kent, although in a similar position, found that her employer's attitude was the key factor, with a large gap between intention and stated policy and practice. The experience of Tania Forrest of working motherhood was remarkably similar to Patricia's and Gemma's and she, of the five, seemed the most satisfied with the outcome she had established for herself. Of all the organisations represented in the research, it was Tania and Patricia's that seemed to offer the most enlightened and forward looking approach to recruiting and retaining staff.

Paula Alexander was employed by the same company as Tania and Patricia and spoke equally highly of their good practice in terms of extended maternity provision and the availability of flexible working arrangements to accommodate her preference for three days a week. She felt that there were strains associated with part-time working, both for her and her colleagues, but that overall these were manageable. Paula spoke of the 'inconvenience' factor to the company of her working reduced hours and, interestingly, she was the only woman to mention this. She seemed to feel that, although she had good skills to offer, it was the company who was doing her a favour by agreeing to her changed work arrangements and she valued this highly and wanted in return to be as flexible and responsive as possible within the constraints of her child-care provision. The message seems to be that employers who value their staff can expect to retain them, together with all the investment they have made in their development. This message obviously does not apply just to civil engineering companies but in an industry that is increasingly troubled by skills shortages, but is still slow to change and embrace diversity, women may be less likely to be regarded as tokens or 'liabilities' in the future. Deciding to work part-time (for whatever reason) carries a risk of putting one's career in jeopardy (Cohn, 2000). However, the experience of these women seems to suggest that there may be some significance in timing when starting a family. Delaying motherhood until a secure professional foothold is established, and one has proved one's value, may well be a predictor of the likely bargaining power one has to return to work following maternity leave on terms that suit. This may also affect longer term career opportunities; none of the women working part-time to enable them to care for their children had changed their employer since becoming mothers and none of them indicated their intention to do so. Gemma Sales was clear that her compromise in working part-time currently was an investment towards an enhanced position with the company in the future.

When Gillian Hayes became a mother she was sure that for her, part-time working could not be a long-term option. This decision was not based on financial necessity, but rather on the need to remain a full-time professional so that her status would not be compromised by a change to her working hours which might signify a lesser commitment to her career. She explains: "*I don't believe that I would have the same standing or respect if I wasn't working full-time. That is my own perception*". A key influence, though, was the nature of the business itself with its well-established long

hours culture and the customer expectations associated with this. Gillian describes this from her own point of view:

“the nature of the industry is not even barely nine to five; it is longer than that at times. You need to be able to respond and be there to pick up the phone. I know myself when I am dealing with public bodies outside (Gillian works in the public sector) when the person I am dealing with only works on a Thursday or doesn't work on a Thursday and it gets to Thursday and I need to speak to them it doesn't help. I find it difficult and I do find myself not outwardly but inwardly criticising if only they were there that day. If I am finding that others will too and I don't want to have that stigma”.

The use of the word 'stigma' implies a negative branding, being made to feel 'different' or of less value. Wilomena Franks, as the mother of three small children, was always clear that she would be returning to work full-time, and her choice, she felt, was limited by the fact that there was no-one on the technical side working part-time in her company. At the time I interviewed Wilomena, she said that some women were starting to come back part-time after maternity leave but a few years previously, when she was in that position, she did not feel that she had that option. She discussed what she saw as a small but significant culture change in the workplace in relation to work/life balance, citing as a principal influence the fact that many male engineers have wives who are working in professional roles, which increases the awareness of the pressures connected with caring, not just for young children but for elderly relatives as well. Several other women commented on this, implying that change will be experience driven.

Wilomena's comments summarises this well: *“I think that the culture has changed not because of people accepting that this is something that they have got to take on board here but because it is affecting them personally in their own lives so that they are more willing to listen”.*

Although Wilomena Frank's comments centred on the impact of parenting on professional roles, the emphasis of the other women was on how motherhood, in particular, is socially constructed. None of the mothers in the study had chosen to take a career break, believing that it would be virtually impossible to re-integrate and re-learn skills and the resulting lack of confidence would seriously undermine their performance on their return. The Engineering and Physical Sciences Research Council (EPSRC) is currently sponsoring a scheme specifically to support female researchers within science and engineering in their return to work after a career break (EPSRC, 2002). The support is in the form of a fellowship intended to help scientists and engineers retrain and update their skills within the context of a particular project following a career break due

to family commitments. Whether such 're-entry' schemes could be extended to the commercial sector is something that the industry might consider, especially in light of the continuing skills shortage.

Finally on the subject of motherhood, there were a few comments about how this additional role was an image asset in the workplace, even a male-dominated workplace. Paula Alexander explains: "*being a mother has actually given me a little bit of a standing in a way with the younger individuals*". Wilomena Franks felt that her role as mother enabled her to interact on a different level with some of her work colleagues, men and women, making for more common ground. She implied that there were times when she felt she had more in common with 'fathers' of young children in her organisation than she did with childless female colleagues. Karen Shaw also spoke about the positive difference it made to her at work when she became a mother: "*a lot more of my colleagues who do have young families became more sort of open about their problems at home*". Generally, Karen was of the view that it is the way that individual women manage the interface between motherhood and work that is so crucial, though she felt that this always operates against a background of organisational resistance to working professional mothers. She and her husband had devised an unusual but effective strategy for the early months of parenthood that included some home working for them both, combined with regular days in the office. For Karen, newly appointed in a high profile position within a public sector agency, it was very important that she managed her image at work so that clients, in particular, were not made aware of her new role and short term temporary working pattern. She felt that this was so important because she was sure that it is the issue of childbirth that is the crunch as far as women's professional progress is concerned. It seems that "*until men can have babies the personal dilemmas and career paths of men and women will be very different*" (Fagenson-Eland & Baugh, 2000:145).

Wendy Johnson and Susan Hamilton were the only interviewees to raise the issue of caring for elderly parents and other relatives. Wendy, the oldest woman in the study, commented that she could see that the cycle of care would be a continuous one with women (particularly those in the professions) choosing to have children later and finding that as their families were becoming independent, care for them would be replaced by caring for old and frail relatives. Wendy was childless, but spoke about the strain of caring for her father over a long period, and recounted the conflict that she

experienced between her roles as carer and engineer and the lack of overall control of her life brought about by the constant balancing of these roles.

5. Sources and consequences of pressure

The main sources of pressure in addition to those already mentioned were having too much work to do, lack of clear guidance from managers concerning prioritising tasks, lack of organisational recognition of work/life balance issues, unexpected family or home 'crises' and the expectation by management that staff can take on additional tasks and responsibilities without acknowledgement of the additional time needed to complete these. This last pressure was experienced by Wanda Jessop as not being 'allowed' to say 'no'; so added to the 'presenteeism' culture is the 'yes' culture. Her view was that those who tried to say 'no' were regarded as less loyal and certainly as less committed as this contradicted expected behaviour. Helen Coates and Susan Leyton's experiences supported this view and reinforced how easy it could be to become labelled as uncooperative. Feelings of overload, stress and conflict were described by a majority of women as features of their working lives. For some this impacted directly on the involvement they had in non-work activities. Two women had considered becoming school governors, another said she would like to run a Brownie pack and others spoke of their interest in voluntary work and charity fund-raising activities but in all cases they felt unable to devote the time to these pursuits because of work demands and specifically the unpredictable nature of construction projects which seemed to have the habit of running into trouble 'almost overnight'.

The consequences of regularly working long hours were feeling emotionally and psychologically drained after work and feeling unable to relax and commit to social arrangements such as having dinner with friends, a visit to the theatre or even to making holiday plans. Wanda Jessop said that her social life had all but disappeared after years of what she called working "*inhumane hours*". On a more general behavioural level the women described the stress of working long hours as resulting variously in irritability, inability to 'lighten up' and respond to friends and family and a feeling of numbness which required a conscious effort to overcome in order to have ordinary social interaction. Pauline Jenkinson referred to this as being mentally and emotionally 'locked in' by work.

The issue of 'feeling guilty' was experienced on a number of levels and seemed particularly significant for women with young families working full-time. The major

consequence of working long hours was exhaustion and guilt that they were not taking part in their children's lives as much as they or their children would like. Susan Leyton referred to guilt from a different perspective. She explained that there had been periods when she had been so absorbed by her children's lives and activities that she had not worked as hard as she could in her job and this had made her feel very guilty. Karen Shaw and Geena Amrouni spoke of the guilt they felt at having to leave work at a set time in order to pick up the children from the child-minder whilst colleagues were still "*slaving away*". This meant that sometimes they would need to ask a colleague to take an urgent phone-call or deal with a problem that could not wait until the next day. This had the effect of making them feel that, despite their efforts to "*just get on with the job and prioritise and pick what really matters*" they were seen by colleagues as poor time-managers and not as efficient as they should be. The pressure to be no less efficient as workers because they were mothers seemed to add great stress to these two women.

Managing to juggle successful careers and family life seemed to be connected to an ability to move across roles and change into the appropriate mind-set. For example, Linda Cook, Melinda Jackson and Geena Amrouni expressed their concerns about role switching and how at various times they had felt unable to adequately fulfil either role of mother or engineer. Some of this stress seemed to be rooted in problems that arose suddenly and unexpectedly such as children becoming ill or having accidents. Other problems were associated with bad planning and lack of information that for example resulted in Linda Cook being unable to see her son in the school nativity play because she was only informed about this the day before. Her experience of her son's school had been that teachers assume that mothers are not working or, if they are, can alter work commitments at short notice. She felt that society is still hostile to working mothers and that in general there is an absence of recognition of their specific needs. Even though, as professionals, these women have some autonomy over their work patterns, the control of one's work life is often mediated by organisational constraints and the expectations of colleagues and this affects the control of one's non-work life.

Another feature of the accounts was the conflict that underpins the construction process and is reproduced in the office setting; this made Helen Coates and Susan Hamilton feel that they were engaged on a daily basis in a kind of warfare. This had profound effects on how they approached each day as they expected to face conflict situations and antagonism from male colleagues. Helen, for instance, talked about "*having your*

armour ready” and Susan saw much of her working day in similar terms “*having to watch your back as otherwise you 'd have a dagger in it*”. This language of battle imagery conveyed what the women saw as the need to be on the defensive all the time and to be prepared for an attack. Wanda Jessop echoed these views and described senior management within the consulting firm where she had been employed for many years as “*always being on the offensive making you feel under attack*”. These women were keenly aware of how undermining and demoralising it was to work within this atmosphere though Susan Hamilton felt that most women in the business were oblivious of the war being waged around them. She explained “*I think it is important that women understand what is going on and too many of them simply have no idea*”. Pauline Jenkinson felt similarly; she characterised relations at work with male colleagues as a “*kind of attrition*” and found that consequently quite a lot of her time was taken up with trying to step out of what she saw as a “*cycle of aggression*”. Her approach was to be assertive and not let it get on top of her but this brought its own difficulties and seemed to add to the problem. She commented that “*if you are a fairly assertive woman then that tends to be seen more easily as aggressive and you know what in a man would be considered normal behaviour in a woman might be seen as aggressive*”.

These four women found this type of aggressive and offensive behaviour psychologically draining and the effects spilled over into their non-work time so that they had to mentally re-adjust to what Helen described as ‘*normal life*’. Susan, in particular, felt that she had to adopt a completely different mindset once she had left work in order for her to engage in social interests.

Several participants described the profession as a ‘club’ and Linda Cook and Helen Coates said that it felt like an “*elite male club*”. This appeared to increase levels of stress with women feeling that they were not fully accepted, and this required them to devote energy to justifying their actions and decisions. Helen Coates, in particular, saw civil engineering increasingly as a social process as well as applied scientific process and she said that this added to women’s problems in the industry. She gave an example of a submission she had had to make at a public hearing about a flood protection scheme and of how she felt undermined by having to re-state the technical case and provide evidence of her professional authority in a way that the male engineers making similar submissions were not. Related to this participants felt that on a general level their skills were not fully recognised by male colleagues. This was experienced as very stressful

and took up much emotional energy and affected the amount of time they felt they needed to be at work.

Not all the interviewees experienced these kinds of pressures and some seemed able to compartmentalise their work and family and social life so that their work/life balance was reasonably good. One factor was the amount of responsibility these women had so that those in the more senior positions spoke of the relentless pressure they experienced from problems on jobs, problems with staff and the difficulties of negotiating organisational processes. Wilomena Franks, a main board director with a leading consultant, was the only woman at this level who spoke with confidence about being able to distance herself from excessive pressure.

6. Balancing strategies and factors

The women's accounts of their professional experience were characterised by expressions of how much they enjoyed their work. The enthusiasm for the industry and the pleasure derived from building structures was a clear theme of their stories. This enjoyment which several characterised as excitement and challenge, seemed to offer a counter balance to the difficulties they faced in terms of the culture of the industry and many found that this compensated for the long hours and other negative aspects. There was one exception, Helen Coates. Though Helen had certainly started in the profession with a sense of social purpose she had found the work to be gradually less satisfying as a result of what she saw as the strongly adversarial ways of working.

The accounts revealed a range of individual balancing strategies to improve poor work/life balance. Wilomena Franks, for example, recognised that creating balance does not involve devoting equal amounts of time and energy to work, family and personal life. Her view was that there are periods when work is prominent and has to be the priority but at others the family becomes the focus. She explained that work had to take precedence, for example, when there is an important deadline, but sometimes family has to take precedence in the case of attending her child's sports day or school concert. She had managed to see the issue as one of cycle and change and that the important factor was to recognise that work/life balance was a dynamic process. This perspective was shared by Wendy Legate and Geena Amrouni who both talked about creating limits or boundaries between work and non-work time. These demarcations appeared to be principally psychological, implying that for them good work/life balance is achieved by mentally shutting off from work when not working. This meant not taking work home

on a regular basis and not discussing work issues with their partners. They both found this difficult.

For two participants (Paula Alexander and Karen Shaw) strategies to improve work/life balance revolved around the needs of their children. Both Paula and Karen were concerned to ensure that whenever they were not working they were “*completely with their children*” giving them maximum time and attention. The effect of this was that neither woman had any time for herself, as they tried to compensate for the many hours spent away from the children. They talked about the activities they did with the children and this was described by both women as ‘quality time’ which seemed to take up every spare moment and every ounce of spare energy leaving them completely drained and almost without a sense of individual ‘self’. I concluded that although this ‘quality time’ spent with the children allowed them to appease their guilt and partially, at least, resolve work/family conflict it did little to enhance their overall wellbeing or improve work/life balance.

Working part-time, as one way of resisting the dominant long hours culture, has been discussed earlier and this is also one strategy chosen by some participants to tackle work/life balance. It was shown, however, not to be a popular strategy, neither was the option of formal flexible working which was seen as being difficult to operate in a project dominated business. Despite this, some spoke about other kinds of flexible working which included being able to work occasionally at home. This particular strategy had been adopted by several interviewees to improve work/life balance, though this brought mixed blessings. The more highly placed women were able to work at home but none did this regularly. They saw the benefits in relation to being able to concentrate more, fewer interruptions and no journey time to and from work which was seen as ‘dead’ time. Two participants who commuted into central London from Reading had bought first-class rail season tickets specifically to ensure that they could get a seat on the train in order to convert this ‘dead’ travel time into productive ‘work’ time. Being able to focus on a specific problem or report away from the office environment increased job satisfaction and was regarded as a positive strategy if used circumspectly. There were disadvantages, however, relating to line management and being ‘seen’ not to be in the office and their productivity being questioned by colleagues. The problem of not ‘being there’ to network with colleagues was also cited as a negative feature of this arrangement.

The pressure caused by not being accepted as a 'full member of the club', described earlier, was dealt with in a number of ways; some women chose to ignore it and others said that as it applied to most women in the profession they preferred not to take it personally. One coping strategy identified by several participants is described by Carolyn Britton referring to female researchers operating within a structure where the dominant cultural model is that of the isolated male intellectual. Britton's research shows how women assume the position of honorary male adopting male success criteria (Britton, 1999:70). For women I interviewed the challenge of gaining acceptance and respect from male peers was part of their daily work routine and for some certainly involved adopting the same 'presenteeism' culture as male colleagues. Apart from those who had established part-time working, it appeared difficult for women to take the risk of breaking out of the long hours mould especially as they felt that their professional credibility was under threat and staying late and coming in early formed the path of least resistance.

An important resource for coping with the stress of balancing multiple roles is support from others. Participants spoke of a range of support mechanisms covering emotional and instrumental or practical support. Only one woman, Karen Shaw, cited the emotional support from a husband or partner as important in balancing work/family demands. Most participants were in dual-career families and this created tensions in terms of sharing parenting and caring roles and also household duties. On the last point, although very little mention was made of how household tasks are allocated (I did not specifically ask about this), it should be noted that other research shows that women in dual-career partnerships spend more time on housework than their male partners and this impacts negatively on work/life balance (Stratton, 2003).

For participants with young children the support from family and friends as well as paid carers for their children was particularly important in improving their quality of life. Victoria Joseph described with affection the support she had received over many years from her child-minder whose devoted care of her two children had '*freed her up mentally and emotionally*' to meet the expectations of her professional role without experiencing the stress of feeling she was an 'absent' mother. This enabled her to concentrate at work, making her more effective and efficient and thus able to focus on home and family life when away from work. Her view was that the key to good work/home balance was maintaining separateness between the two. Other strategies for

improving work/life balance included the employment of cleaners, gardeners and 'odd job men' to aid the smooth running of the home. These privatised solutions involving low-paid workers were seen as a necessity rather than a luxury particularly in releasing women to have some quality leisure time.

7. Conclusion

Work/life balance was a concern for most of the interviewees but particularly for those with young children. For some, the unlikely prospect that they could ever work 'civilised' hours as a civil engineer, had made them choose between their career and having children. Others, though, had managed to combine very successful careers with having a family and the theme of their stories is that of a relentless 'juggling act'. The visibility of motherhood within the workplace emerged as a key issue as most of the participants who are mothers felt that they had to 'play down' this role. This is consistent with the findings of Pascall (1986), Cockburn (1991) and Hattery (2001) discussed in Chapter Three. This had a profound impact on their approach to work with them striving to make their professional role highly visible to counteract marginalisation by male colleagues. The effect on those working both full and part-time was that they worked longer than their contracted hours and most took work home on a regular basis with consequent negative effects on their family time.

Work/life balance has been shown to operate on a number of levels affecting women in different personal circumstances. The only participant (Helen Coates) who was intending to leave the profession had made this decision because of the continuing poor work/life balance she was experiencing. Helen, who is single with no children, has found that her quality of life has diminished because of the expectation within the profession that work is dominant. She told me that she had made this decision mainly because of the atmosphere of conflict present in what she described as "*civil engineering behaviour*", and because of the continuous long hours she was expected to work. This second factor she said was critical as it affected the rest of her life and left her feeling drained and with no energy to enjoy leisure activities. Her view is that there is little sign of change to working practices and she sees no evidence of a culture shift towards making the profession more family or person friendly (as she put it). She felt that women within the profession feel pressurised to conform to the mainstream culture of 'presenteeism' and that challenging this on a personal level has no wider impact and only serves to undermine individual career prospects. The sense that women in the

industry are colluding with the dominant ethos of the industry that is based on a clear separation between work and home and on the necessity to prioritise work commitments is developed in Chapter Nine as part of the research conclusions.

Although most participants felt that changing the work practices of the profession would benefit all those within it, particularly improving work/life balance, there was disagreement about exactly what change was needed and about how this could be achieved. The next chapter will consider the wider issue of change within the profession looking at possible agents or catalysts for changing the cultural context of construction focusing on diversity, equal opportunities and structured support mechanisms.

CHAPTER EIGHT

AGENTS FOR CHANGE

1. Introduction

This chapter discusses the issue of change within the profession and broadly considers this in terms of 'agents for change' that will encourage more women to enter the industry improving women's professional experience within it. The term 'agents for change' encompasses a range of policies and initiatives that can act as catalysts for both generic and gendered change (Greed, 2000) with the focus of this discussion being mainly on the latter.

The chapter has a dual perspective focusing on initiatives directed at quantitative improvements in the participation of women and on measures that will bring about qualitative enhancements to their working experience and to the profession as a whole. These two types of change do not operate separately and both can be internally and externally induced. As noted in Chapters Two and Three, concern about women's representation and status within the industry has been increasingly evident in the profession's own journals and this has formed part of the wider concern about the decreasing numbers of both men and women taking up the profession with a more recent emphasis on staff retention. The problem of retaining women is discussed in relation to a number of support strategies that have been shown to enhance the experience of women in the workplace. Mentoring and networking were identified as important in helping women fit into the dominant male culture and several interviewees are involved in these kinds of activities both within employer organisations and the ICE.

The concept of 'critical mass' discussed in Chapter Three is helpful in signalling that qualitative change to the culture and practices within the industry may derive from quantitative improvements to the numbers of women entering and remaining within the profession. This characterised the view of a majority of women in this study with several interviewees specifically referring to a lack of female role models. A recurring view was that if only more women entered the profession and stayed within it then women's views (to the extent that these might be different from men's views) would be heard. The participants implied that more women in the profession would lead to less conflict and more family-friendly work patterns. This last issue has been

discussed in the previous chapter in relation to a range of strategies for achieving work/life balance. More formalised attempts, though, have been made to modernise the profession and the introduction of equal opportunities policies across the industry was cited by some as significant.

Before discussing in depth the interviewees' perceptions of change within the profession some general comment about the relevance of this issue to their daily working lives will give a framework for the particular views that follow. The categorisation of possible change catalysts by Greed (see Chapter Three) as either 'bottom up' or 'top down' was used in analysing the interviewees' opinions about the nature and extent of change that they felt could realistically be expected in the foreseeable future. Comment about the effectiveness of high profile 'top down' initiatives such as the Construction Best Practice Programme or the Latham Report (discussed in Chapters Two and Three) in delivering change, were limited to those who had had some direct involvement in these. These highly publicised reviews appeared not to have had any impact on the career experience of nearly all the participants, who did not, in the main, associate the work of these groups with any noticeable improvements to industry practices. Furthermore, none of the interviewees mentioned the activities of any of the 'bottom up' groups operating outside of the mainstream such as those of the Women's Design Service. The women's general attitude, therefore, towards progressive change to the profession could best be described as reticent and pessimistic and was more concerned with small improvements within the companies for whom they worked and with those changes that would affect their individual circumstances. Very few showed any enthusiasm for personally becoming engaged with activities that might change wider attitudes and practices within the industry. One reason for this was the long hours that most of them already worked but more significant appeared to be their acceptance of the culture of the profession that they perceived as being highly resistant to change. A majority was unhappy with the culture but resigned to it but some did not feel that changing work practices was a significant priority.

There were exceptions and Susan Hamilton, Karen Shaw and Wendy Legate were all determined campaigners for a more inclusive profession to meet the needs of the changing marketplace. These women are convinced that it is the business case for change that will bring results rather than the moral case which, they felt, had no

persuasive impact on industry leaders in general. Although most participants were resigned to the culture of the profession they also recognised that modernising practices would be positive.

The chapter considers these aspects of change from the participants' perspective and is broken down into four sections starting with influences on career choice considering both structural and personal factors. The second section explores the issue of equal opportunities within construction, focusing on equal pay and career progression. The third and fourth sections discuss a number of formal and informal support strategies, particularly mentoring and the use of networking.

The issue of 'critical mass' referred to above concerns the size of a minority necessary to affect cultural or attitudinal change amongst the wider group. Whether larger numbers of women will in fact produce change is unclear though most of the interviewees felt that it would. The reasons why women join the profession are therefore relevant and so the chapter begins by considering the elements contributing to their choice focusing on educational and structural issues.

2. Influences on career choice

The short biographies of the interviewees outlined in Chapter Five have been included to demonstrate the different perspectives and personal circumstances of the interviewees and to provide some background information about their professional career development. Their reasons for entering the profession were diverse and were shown to be an educational as well as a social issue and, in some cases, a family matter. The encouragement from male family members, especially fathers, to some participants to join the profession was a powerful influence. However, it is not appropriate to identify this as an agent for change within the terms of the analytical framework. Discussion of this aspect has therefore been included in chapter six as several accounts revealed that a major impact of the 'engineering father' was an early introduction to the subculture of the profession. As these particular women progressed the continuing advice and support from fathers and other male family members appeared to help women negotiate the cultural aspects of the industry and enable them to fit more comfortably within the male-dominated environment of construction.

This section thus begins with discussion of educational impacts on the career choice of participants looking particularly at the different experience of interviewees from single sex and co-educational schools.

(i) Educational impacts

Research conducted by EPSRC into how to encourage more women into science, engineering and technology (SET) and how best to support those women who take up research careers in this area, has found that the seeds of female under-representation in the sector are sown early in life and, at one level, seems to start at school (EPSRC, 2002). Further research shows that girls' academic achievement is higher in all-girl schools than for girls in mixed schools, and that more girls take science subjects at A level in single sex schools than do girls in mixed schools (Benn & Chitty, 1996).

Of the thirty-one engineers contributing to the study, nineteen attended single sex schools and twelve attended mixed schools. Although there were some differences between the two groups in their comments about the way their subject choices were received by teachers and parents, in general, these were not seen as exceptional or unusual. A more significant difference between the groups lay in the proportions taking maths, further maths and physics. In the all-girl schools, the balance between these subjects and the arts, humanities and languages was remembered as being fairly even. The women who had attended mixed schools, however, all reported that there were significantly greater proportions of boys than girls taking maths and science and technology subjects. Miranda Ellis who had attended a mixed school in Scotland explained:

"my rector at school, when I took technical drawing for highers called me into his office and sort of said 'do you really want to do this?' He was quite surprised that I had picked that and said that I should think very carefully about it which is something that I don't think he would have done if a boy had chosen that subject".

Melinda Jackson, who had attended a well known mixed public school, commented that she was one of only two girls in a class of twenty-five taking maths and physics 'A' levels. Her choice had been met with some consternation by her mother who *"couldn't understand why I had decided to go down that route"*. For some women these kinds of reactions to their subject choices led to feelings of being 'different' or outside the mainstream and were experienced negatively. In other cases this feeling of 'difference' brought much determination to pursue an engineering career which was perceived as being varied, offering them opportunities for travel to *"exciting*

destinations building dams and doing water related projects in the Middle East and the Far East”.

The decisions about which subjects they would study in the sixth form was, in most cases, informed by considerations of future career options and university courses with their related entry requirements and for some this process of career choice had started in their early teens. Langford et al (1995) argue that education acts as the gatekeeper to the construction culture and that further and higher education both actively and passively promote the masculine culture of the sector. My findings support this. Although the women who had attended all-girl schools indicated that taking science subjects at A level was regarded by their teachers as just as ‘normal’ a choice as taking arts or humanities subjects, several women explained that a different reaction occurred when they were considering which course to take at university. Some reported that with science A levels the choice of medicine, for instance, was seen as a more ‘natural’ one than civil engineering.

Some had to overcome problems in order to study their chosen combination of subjects with timetable constraints cited in some cases as a particular difficulty. It is not only the constraints of the curriculum, though, that restrict choice; as far as non-traditional subject choices go, the main barriers to girls (and boys) choices in these areas appear to be cultural. Rees (1992) contends that whilst school education is experienced differently across class, race and gender, it is primarily gender which characterises option choice. The experience of a number of the women bears this out with their having to justify what were seen by some teachers and parents as obscure choices, leading to possible difficulties in gaining entry to degree courses and eventual employment. As Victoria Joseph commented *"when I said I was going to do civil engineering there was total uproar. I mean the school wouldn't help me with my UCCA form, nothing"*. When I asked her what was the stated reason behind this opposition she explained that the view of both the school and her parents was that she had been given a fine education and was just going to throw it away. Similarly, Barbara Bing Turner explained that when she was in the process of choosing her ‘A’ level subjects, with a view to becoming an engineer, her father was very sceptical: *"he tried to put me off very hard and he forced me to work at the local garage to try and show me exactly what real engineering was about and how awful it was to be a girl in a man's world"*.

This theme of the importance of challenging stereotypes was taken up by Paula Alexander who saw this as an education issue. She acts as a 'visiting engineer' to some local secondary schools and participates in their engineering clubs that are run as voluntary after school activities. She has found that in the local mixed comprehensive around twenty pupils attend and they are all boys. She also visits a local girls school and finds that the club is strongly supported by a small core group who regularly outperform the boys in the regional engineering competitions. Her view is that industry needs to be more proactive in forming partnerships with schools as a way of influencing young people to consider civil engineering as a worthwhile career. She feels that young women engineers can do much to infiltrate the male subculture of the profession by demonstrating their enthusiasm for their work.

Careers guidance is offered to young people at various stages of their secondary education and has been made an integral feature of the post sixteen compulsory sector. In its new characterisation as 'Connexions' the careers guidance service is made available to students in a variety of ways and is intended to operate in conjunction with the school curriculum. The women's views of the 'old style' careers service focused on the lack of encouragement received from school careers advisers with more than half of the women commenting on how ineffectual these had been. Careers advisers were described variously as being "indifferent", "ill informed" and "unhelpful". These findings differ from those of Langford et al (1995: 178) who reported from their research that careers advisers and teachers were both influential in the career choice made by participants in their research. In this study their impact on the whole was negative and one woman commented that her careers adviser had strongly directed her away from choosing civil engineering on the basis that she would never get a job. In the main, and particularly for those women who did not have close family members who were engineers, the process of finding out about the profession seemed very much to be a 'self help' exercise. The reaction to available careers publications was mixed, with about half reporting that these had offered a positive influence, and the other half commenting that these had not provided enough detail, or had reinforced the male engineering stereotype.

(ii) Structured encouragement

Science and engineering has been the subject of a range of initiatives aimed at making quantitative improvements to the representation of women and in particular to

position careers within this sector as just as open to young women as they already clearly are to young men. These initiatives (discussed in Chapters Two and Three) have been given a high profile by industry leaders and constitute a formalised strategic or 'top down' approach to encouraging more women into science, technology and engineering professions. The Women's Engineering Society, for example, through its web site and network of local groups offers advice, information and support to women engineers. The WISE (Women into Science and Engineering) campaign, aimed at changing the attitudes of young people, parents, teachers and the general public about the suitability of engineering as a career for women, has taken a variety of forms. Projects have ranged from visits to local secondary schools by female engineers, to a travelling WISE bus with publicity information and small-scale exhibits, all designed to make young girls aware of 'alternative' careers in these fields. In some areas of the country, residential weekends and summer schools are organised, where there is an opportunity for girls to see first hand what engineering has to offer. Although activities arranged as part of the WISE programme have been creative their impacts do not seem to have permeated the school ethos which, as demonstrated by this research, continues to reinforce career stereotypes. Nevertheless, I felt that it was important to explore the influence of these programmes as effective agents for change and specifically to discover what, if any, impact these had had on the women taking part. Six women could trace their decision to take up engineering to one or more of these activities.

Marion King had attended two separate residential Into Science Technology and Engineering (INSITE) courses, which she said put her career choice beyond doubt. Miriam McClean stated similarly that her participation in another INSITE course cleared up any doubts that she had. Wanda Jessop cited the visit of two female engineers to her school as the turning point in her decision-making process which originally had led her to consider architecture. Linda Cook had a clear memory of her visit with three school friends to a large construction site, after which she was sure of the career path she wanted to follow. In all these cases the enjoyment of maths and science subjects at school had laid the foundation for considering an engineering career, but this was strongly allied to the concept of wanting to apply the science and particularly a fascination with structures and the wish to 'build' them. For both Molly Peters and Clare Sanderson, a mixed experience of informative careers talks at school

by female engineers and participation on an INSITE course proved to be very influential in their decision to read civil engineering at university.

From this small-scale study, it is difficult to assess the value of these schemes, particularly whether these initiatives confirm career choice rather than offer fresh options. For a fifth of the women, however, these initiatives clearly had had a strong impact on influencing career paths although the extent to which they have transformed broader societal attitudes towards women taking up technical occupations is not clear. Nevertheless, the WISE programme continues with financial support from professional engineering bodies and some employers and there is a regular distribution of bulletins and newsletters to schools, trying to keep the profile of women in the engineering professions on the 'agenda'. One aspect of this kind of approach is the need to recognise that educating girls about these engineering career options must begin sooner rather than later. Two of the women commented that the activities in this area had begun for them well before they were required to choose their GCSE options and both the women attributed their positive impact to the early timing.

(iii) Positive images of engineering

One of the influences affecting career choice was a sense of wanting to contribute in a creative way to the built environment that was often part of having a sense of vocation. This finding is consistent with Langford's research which showed that *"females found the industry more attractive when it was linked with socially useful aspects of life such as the repair of old people's accommodation and the building of schools"* (Langford et al, 1995: 179). When I asked Susan Hamilton, now a prominent member of the profession and a well-known campaigner for equal opportunities, what had influenced her choice of career, she responded by saying:

"it just came from inside me. When I was about eleven the M1 was newly opened and my father took us to the bit near Watford and we drove up a few miles of it and I just thought that this was the best thing I had ever seen and I wanted to know how to design and build motorways and bridges and it just gave me a sort of ambition. I wanted to do something practical and that experience of going on the motorway stayed with me and it became a toss up for me between architecture and civil engineering, something tangible".

Wendy Legate whose father was a medical practitioner put her choice down to the wonder she experienced, observing how a bridge was being constructed close to

where she lived. In her current role as director of a large contractor, her enthusiasm for the building process seems not to have waned:

“ I used to go down there with my parents as a very young little girl and would be sitting on some concrete foundations next to it and I was fascinated by the bridge and how it was built, who was building it and you know what materials they were using and it became a bit of you know I want to build bridges.....and I could see it from our school hockey pitch so that is really what got me interested and then I found out more about civil engineering itself.....so I stuck to my I want to build bridges”.

Associated with a sense of vocation was the aspect of civil engineering that is ‘social conscience’. For Helen Coates this aspect provided a clear motivation for her career direction, in as much as she felt that she possessed any career direction in the conventional understanding of the phrase. *“One of the reasons for doing engineering was that I wanted to do something that was useful to people and that was one of the reasons why I went into water engineering because of drinking water”.*

The two women in the study from ethnic minority groups identified the main influence in their choice of career as being ‘cultural’. Geena Amrouni spoke of how she arrived at her choice: *“ I suppose where I come from if you are good at science you either study medicine or you study engineering. I didn’t fancy being surrounded by sick people all the time so I studied engineering.....it was the natural thing for me to do anyway”.*

Although she characterised her decision as positive, her options appeared to be significantly narrowed by this cultural expectation, so that she was more or less forced to go down the engineering road as the lesser of two evils. Meena Patel made a positive choice to do civil engineering in clear opposition to going down the expected professional route for an Asian woman of taking business studies. She explained:

“Whenever you talk to Asian people girls are always expected to go into business and finance and I felt oh my God I am going to end up doing the same thing. But then I thought to myself, no I’m not going to stand for it, I’m going to do what I want to do and not what I am told to do”.

Neither of the women expressed regret at their decision, though Meena had certainly experienced some opposition from her family and the family of her fiance who were concerned about her position as a soon-to-be-married woman, working on construction sites in a strongly male-dominated environment. The cultural impacts seemed to operate in very different ways: in one case the choice was positive but

confined, and in the other case it was a positive move in reaction to a perceived alternative negative role stereotype.

Being able to use the pure science and maths disciplines in an applied way was a strong influence on choice of career for several women, who spoke about how important this aspect had been for them in determining their career path. Wilomena Franks enjoyed maths but was drawn more towards a profession that would allow her to use her skill in a practical way. She explained it thus: *“I was attracted by being able to do things that were sort of mathematically difficult that you had hands on experience with at the end of the day”*. Linda Cook spoke similarly: *“civil engineering was the one (career) that appealed, that had the flexibility of working in an office, working on site, variety....it had a practical base”*.

Wanda Jessop also had a clear recollection of how important it was to her to be able to apply her mathematical skills and see an end product. She described it thus:

“ I put it down to the fact that four women engineers came to speak to us when we were about fourteen at school. In fact they were electrical and mechanical engineers and one of them particularly said that she had always enjoyed making things and I had always spent my holidays you know doing some craft or other. And then I didn't ever change my mind and I read about Brunel and it just seemed like the right thing and I was good at maths and so it was like a good combination”.

Many other comments were made in the same vein. Susan Leyton explained: *“I always wanted to do something practical ...and at the time I felt that Civils gave more opportunities for women”*. Gillian Hayes summarised the basis of her choice by saying: *“ I think I enjoyed hydraulics and the fluid side. I enjoyed the hydraulics actually because I could mentally picture theorems and the like”*. Naomi Gill really enjoyed maths but could not quite see where this would lead in an applied sense *“ I was wanting to do a maths degree but didn't like the pure so I chose engineering”*. Christine Allen's reasoning was very straightforward: *“actually civil engineering is quite a practically based subject which is why I wanted to do it”*. Miranda Ellis felt similarly: *“ I was sort of interested in physics, maths and technical interests. I think that I was interested in engineering just generally”*.

Although Helen Coates cited a number of factors that had led her to be an engineer, central to her considerations were the issues of both performing a function that was socially useful and doing something that was practical. Much of her fourteen-year career has been spent in the field of water engineering, with the opportunity to work

on a number of irrigation projects in the third world. For her being a scientist in a laboratory did not appeal: *“I wanted to do a job which was helpful to people and had sort of practical implications. You know if you are going to do something with science and not work in a lab, engineering seemed to be one of the options”*.

The interview schedule addressed the occupations and social backgrounds of the women’s parents and this revealed that virtually all the women were from middle class families. This was not unexpected, as civil engineering, like other professions, is grounded in a strong middle class culture. Nevertheless, not all the women fitted this expectation. Victoria Joseph came from a traditional working class home, where work was very much characterised as a job, as opposed to a career with all its connotations of advancement, achievement and satisfaction. Her career choice met with the strongest recorded opposition in the study and her insistence that she would pursue her choice was regarded very much as her ‘breaking out’. Linda Cook, from a blue-collar background, commented that her choice met with some surprise from her family, but no resistance. She put this down to *“ignorance about what civil engineering was”*.

Educational and career choice is thus a complex process that is subject to a multiplicity of variables operating at different levels beginning in early childhood. Part of what is meant by the term ‘socialisation process’ is the way that these variables interact to affect and influence an individual’s values and aspirations, resulting in an innate understanding of what might be possible, set against what is appropriate or acceptable within social boundaries. For example, women whose fathers or grandfathers were engineers spoke of their career choice in terms of it being more ‘natural’ or ‘expected’ than those who did not have engineering ‘in the family’. The mothers of these women seemed to have liberal gender role attitudes that enabled them to positively support the choice their daughters had made. Significantly, none of the participants felt that they had just ‘ended up’ in civil engineering. For each their choice of career was the result of either a long established preference, or a well-considered ‘on balance’ option as an alternative, for instance, to architecture which for three women had been their original choice of profession. This theme of how some men end up in the industry in contrast to a proactive choice made by women is summarised well by Wendy Johnson:

“men sort of fall into engineering because it is a traditional thing to do and very often it is the men who haven't quite got the scientific abilities to be doing the pure sciences. If a woman wants to get into engineering though she is doing it because she wants to because it isn't a traditional direction to go in and therefore is much more motivated to be doing it”.

These findings are confirmed by an earlier study (Watts, 1995) which found that a majority of men interviewed had just ‘stumbled into’ the profession, some even with little conception of what it would involve, whilst the women were clear that they really wanted to become engineers, having considered a variety of options.

In summarising this section the most influential agents for change in determining or confirming career choice seemed to be formal ‘top down’ initiatives such as WISE. Although this was important for individuals within the group, its work has not made significant inroads into the culture of schools, particularly, it seems in the co-educational context where girls are more often directed towards pursuing arts and humanities subjects.

3. Equal opportunities

The discussion so far has centred on agents for change connected with increasing the numbers of women coming into the profession. Although, the formal exclusion of suitably qualified individuals from occupations on the basis of gender has (in principle) been eliminated there are a number of factors arising from the profession's own structures and culture that militate against an open and anti-discriminatory workplace. The issue of equal opportunities is discussed in the following sections and considers in particular whether as a policy this can have any impact on institutional barriers to women entering and remaining within the profession.

Equal opportunities has been characterised by Greed (1999) as a mainstream ‘insider’ initiative linking central and marginal agents for change within the profession. The focus of equal opportunities policies to date within the industry has been on eliminating discrimination in recruitment and selection procedures and is currently directed at increasing diversity.

On 12 June 2000 the ICE launched its Equal Opportunities Forum named ICEFLOE – Fair, Level, Open, Equal – that is intended to give a focus to the need to develop human potential in civil engineering. This event was well attended by the press and many well-known figures in the profession. Four of the women contributing to this study were instrumental in establishing the Forum, that not only encompasses gender,

but embraces diversity more generally - disability, age, sexuality, race and ethnicity and can be categorised as a 'top down' agent for change. The existence of the Forum represents a significant step forward for women because it is part of the growing recognition in the industry that to sustain a successful company in an increasingly competitive business climate employers need staff with appropriate skills and experience. Furthermore there is now wider discussion of the employee mix of the profession especially in relation to ethnic diversity. These two factors point the industry towards an approach to recruitment and promotion that can be summarised as 'appointing the best person for the job'. A phrase appearing on the front of a recent ICE membership leaflet is "civil engineering has no boundaries" suggesting that the profession, in terms of its formal organisational structure, is attempting to cast itself in a new, progressive light.

The creation of ICEFLOE followed a Government-backed project launched in February 2000 called 'Change the face of Construction'. The aim of the project is to widen the pool of talent available to employers right across the construction industry through a new 'practical approach' campaign targeted at women, those with disabilities and black and ethnic minorities. Research, carried out as part of that project, shows that women still account for only three per cent of industry employees (NCE, 3 February 2000:7). These figures refer to the construction industry overall and include all grades of technical and unskilled staff. The campaign hopes to boost these figures to twenty five per cent. The research also estimates that whilst ninety seven per cent of construction companies have equal opportunities policies, only thirty five per cent have plans to implement them. My research has thrown up similar findings. Sandi Rhys-Jones, one of the campaign organisers, explains the basis of the project: *"companies which actively follow equal opportunities can benefit from greater diversity of knowledge, skills and attributes. Also, by including minorities, they are provided with a larger talent pool from which they can recruit the best staff available"* (NCE, 3 February 2000:7).

The discussion that follows is based on the participants' different perceptions of equal opportunities and their engagement with it both at an individual and structural level.

(i) Understanding of equal opportunities

Each interviewee was asked if her company had an equal opportunities policy in place. Of the thirty-one women, three had their own consultancies operating mainly

on a sole trader basis, so for them the question was not wholly applicable. In one of these cases though, where a small number of people are employed, the position was quite clear *"our very outspoken, very stated policy is children come first"*. This tenet formed the basis of the equal opportunities policy adopted by this small company and its director, Victoria Joseph, explained that it worked well because all staff were equally committed to ensuring that flexible working did not compromise the viability of the business. Of the remaining twenty-eight, sixteen were sure that their employers had a policy in place, though there was a lot of fuzziness about what the policy actually was and how it was implemented or monitored. Two women stated that their employer did not have a formal policy and ten were unsure whether a policy was in place. Of this last group, two were in director positions. This response breakdown illustrates the varying awareness levels about this issue. The overriding impression was that generally this was not really a priority for them, either as individuals or as a group within the profession. There were some exceptions, notably Susan Hamilton, Miriam McClean, Wendy Legate and Karen Shaw, all of whom have been proactive in making these issues more visible across the industry.

It was not possible to explore in depth what participants understood by the phrase 'equal opportunities' in its formal use. During the course of the interviews, however, equal opportunity issues kept cropping up such as access to promotion, being paid at the same level as male colleagues of similar status, being able to work without harassment, being treated in a particular way because of one's gender and having to constantly demonstrate competence to establish credibility.

Key contributions on this topic came from Susan Hamilton and Wendy Legate who are both involved in equal opportunities work within the profession. Wendy summarised her understanding of equal opportunities in terms of not locking people into stereotypes and not making assumptions about them. Both women explained what they saw as the strong business case for equal opportunities in the construction industry that already faces a growing skills shortage. Their view was that this shortage would worsen, unless the industry tackles its poor equal opportunities record and attracts more of the best young people to its ranks. Susan Hamilton explains:

"I just think that overall I've tended to feel years ago that well women had equal rights to things, now I tend to promote the business case because I truly do feel that companies are missing out by not using diversity in the workforce whether they are you know black and ethnic minorities, whether it's the disabled, whether it is women

whoever they are missing out on a diversity of ideas and creativity as well as communication skills and everything else. But I think also there is a terrible ignorance of the fact that bad assumptions are being made, discrimination is happening and a great complacency. Most engineers that you speak to think that they are jolly decent men and they would never discriminate or do anything to hurt anybody's progress. In fact, the attitude of much of top management is offensive and the only way to counter this and improve the situation is to raise awareness of equal opportunities issues and really training in this area needs to be provided to much of the senior management in the industry. This is particularly needed in view of the evidence which shows in the company appraisal systems that the performance of the women engineers may in fact be better in general than the men's. It seems that those responsible for staff reviews and training are lacking in equal opportunity awareness. The case that I am putting forward is that it is equal opportunities that should drive the business forward to enhance the bottom line and profit margins”.

Wendy Legate described some of the recent culture changes within the company with whom she is a director. These were initiated because of bad customer care messages being received; the company had been characterised by clients as aggressive, claims conscious and adversarial in its approach to contracts. During a three-year change programme the company set about transforming attitudes to both employees and clients; it introduced an extensive equal opportunities initiative that began by giving priority to the promotion of women. Wendy explained:

“the company became much more people oriented and within a year they realised that women within the company had not been given the opportunities that they should have been given, that women were actually treated quite badly within the company and that there weren't a lot of women working on the technical side of the company at all. So they decided to promote that and they started with a women's development programme to build confidence and self esteem within women employees, so that they felt that they could actually achieve more, rather than always being told, you know, you are just a woman. And out of that came an appreciation that having more women in the company created a diversity which actually led to better business”.

The real issue then seemed to be that those at the top of the profession need persuading that more women in the business improves the bottom line. However, there are contradictions as there are resource, and per se, cost implications of implementing policies designed to affect transformative rather than just cosmetic change.

This issue is taken up by Brenda Cole, Human Resource (HR) manager with a large consultant based in the Thames Valley. Prompted by an article published in The NCE, I went to see Brenda to discuss the measures her company was implementing as a culture change initiative to eradicate prejudice within a newly formed larger organisation. My discussions with Brenda focused on the role of HR departments in

championing the equal opportunities cause. Her approach to 'converting' the board of directors to agreeing to what she described as a 'full equality policy' was to promote the business case in terms of reducing staff turnover. The key tool of this policy had been the introduction of efforts to achieve Investors in People (IIP) status. Brenda regarded the award of this status as a benchmark for the company in terms of 'good practice' and in a competitive employment market she felt that this could be a positive differentiator. She explained that over the previous year staff turnover had been reduced significantly. At the start of the period it had been running at twenty eight per cent but by the end of the year it was down to seventeen per cent. She said that because this outcome was measurable she used it as a clear justification for the company's commitment to the programme. The cost savings brought about by the reduced need for recruitment activity proved highly persuasive in promoting the business case. Also influential was the possibility of the HR unit being able to offer training and advice to other companies in the area (not competitors) about the process, so that this would become a new income generating activity for the company. A further business benefit would be that this activity would heavily subsidise the in-house company training budget.

(ii) Equal opportunities on construction sites

Wendy Legate was the only participant to speak positively about the prospects for changing the culture and long established behavioural patterns of the construction site as a way of valuing employees who work on these sites. In her role as director of a large contractor she has been able to introduce a code of behaviour for site working that prohibits the display of pornographic material. This is part of a culture change that her company has tried to initiate which she broadly described as 'integrity at work'. The feedback from female employees clearly indicated that they were no longer prepared to put up with this harassment. Wendy explained that consultation with staff about how to improve their experience of work was crucial to legitimising changed practice.

Recent improvements in site working were commented upon by other participants, were seen as stemming mainly from more women choosing to work in construction, either at the professional or the craft level. Wendy Johnson's comment summarises the views of several participants that whilst women have not achieved a presence that equates to anything like 'critical mass' there are more women on construction sites

and their expectation was that this would gradually improve working conditions for everyone.

“Originally I was really the only woman apart from the site secretary who would be on a site but now I see more women, clients have more women, the RE staff have women employed by them, suppliers and sub contractors have women and that creates a better environment. So I think it is getting better but not fast enough though”.

This study suggests that the general working environment on construction sites is improving, resulting mainly from greater attention to health and safety issues by employers, and from the wider debate taking place about more progressive working practices generally.¹ The move to shorter working hours and reduced weekend working (unless vital) is an example. The fact that more women are now working on site has itself brought about changes to some of the social culture that operates on site and the adversarial relationship that so often exists between contractors and consultants is declining. Despite this, the gender issue in construction will not go away and the view of most participants was that whilst there have been small improvements to working arrangements on site, women are not generally made to feel welcome. This is still very much male territory.

Valuing difference was also discussed in relation to the growing emphasis being placed on ‘softer’ skills relating to the management of both people and projects. Construction is steeped in adversarial working practices arising from mistrust between consultants, contractors and clients; the idea that contractors will short-cut areas of work to build their margin on the job, that designers will specify materials of adequate but low quality to cut the bidding price and so on. As Penny James (a director with a public sector research and information agency) put it:

“co-operation is anathema to the construction industry. I mean when I joined – it was very confrontational. It was standard practice to take each other to court at the end of the contract almost. That still goes on but it is now considered old fashioned and it is definitely changing”.

With this in mind, a change towards more co-operative ways of working was seen to be both necessary and very much down to some of the senior women coming through as agents for change. Operating in this litigious and hostile environment has had huge costs both in financial and human terms and the consensus of the interviewees seemed to be that it just does not make sense to run jobs on the back of a blame culture. There

¹ The report of the Construction Task Force “Re-thinking Construction” published by DTI, 11 April 2001. Foreword by Sir John Egan.

was talk of partnership and consultation to generate a more *'joined up construction industry'* as Penny put it. Women were identified as having a significant role to play in promoting more co-operative styles of working. One point that was made is that the industry has little to lose by adopting this kind of work practice, because margins on jobs are tighter than ever before, so these need to be assured and not lost and frittered away in down time on disputes and contractual wrangles. This forms part of the business case for striving for equal opportunities ways of working.

Although several women spoke about the positive contribution they felt that women can bring to construction, there was little mention of how this contribution is perceived by men in the industry. One comment, which brought some insight, came from Susan Hamilton, arising from her twenty-five years in the profession:

"I think that there are lots of complexities about men not understanding women's capability, not valuing what they have to offer because it may be different, without realising that it may actually be equally valuable, perhaps even more valuable in some ways".

(iii) Equal pay

Virtually all the women in the study felt that they had received equal treatment in their professional life in terms of training and professional development opportunities. Indeed, in relation to continuing professional development events, all considered that they had been generously treated and certainly as well and, in one or two cases, better, than their male colleagues. The issue of pay, though, which is key to sex discrimination, was less clear. The uncertainty expressed about this issue by the interviewees is set against the background of recently released figures which show that the gross hourly earnings of women in professional occupations are ten per cent less than those of their male counterparts (EOC, 2003). As discussed in chapter two, within civil engineering there is evidence to show that the gender pay gap for mid-career professionals is considerably greater with men earning thirty five per cent more than their female colleagues (NCE, 6 June 2002). There is a similar situation within higher education where pay differentials between men and women exist at every level, from lecturer and researcher right through to professor and vice-chancellor (Guardian, 4 February 2003). The stated position of all the companies represented in this study is that individual salary levels are treated as confidential. That being said, it does not follow that there is no sharing of this knowledge amongst colleagues informally or that confidentiality is always maintained in practice within an organisation. If

confidentiality masks gender pay inequality, then companies who are serious about equal opportunities can carry out a formal pay audit that examines the detail of the pay structure according to any declared grading or 'banding'. This policy of 'secrecy' about individual salaries was not questioned and the participants seemed to have accepted it as normal practice in the profession. However, there was unease about whether 'confidentiality' was really an excuse to pay men more than women. Susan Leyton, a very experienced engineer working for a mainstream consultant, explained that she was considering invoking her company's equal opportunities policy to challenge a clear disparity in pay between herself and another member of staff working at the same level. Miriam McClean, associate director with a mainstream consultant, also spoke about the same problem, which she saw as definitely gender based: *"it is a very difficult issue to deal with. It is a matter of proving that you are doing the same job and have the same responsibility as an equivalent male. I would say that we are definitely behind our male contemporaries"*.

Susan Hamilton spoke about the "shabby" treatment she had received whilst acting on an interim basis as joint managing director of a major consultant. The board refused to pay her any more money for this extra responsibility and Susan was sure that they would not have treated a man similarly. She left the company because, as she put it:

"I will not be treated like that. I made it clear to the management that I expected to be paid more with this promotion and I don't know whether it was a battle of wills or a test of how malleable I would be but it was refused and that was the last straw in my view".

Brenda Cole, the HR manager, said that in common with many consultants her organisation operated a grading structure for all employees. She explained that this in some instances had become rather anomalous due to the long service of considerable numbers of employees, resulting in a blurring of salary bands both within and beyond grades. But, as Brenda explained:

"what it comes down to and this is the crux of the matter is that everyone has to negotiate their own salary package when they join the company and I think it depends how forceful you are as a woman because I didn't negotiate a very good package because I was returning from maternity leave. I didn't feel that I was worth as much because I had been out of the workplace and I wasn't sure that anyone would give me a job because I had been out for two years."

She was clear about why she felt underpaid:

“so you could say, yes, I feel underpaid but it’s not because they have underpaid me it’s because it is the deal I negotiated when I joined and it is difficult then to make leaps and bounds from what is then a lower beginning or starting point. Having said that when I raised it as an issue it was dealt with. It did teach me a vital lesson and you have got to negotiate that package right at the beginning”.

This perception explaining how pay differentials can originate is a significant finding of the research. The same issue was touched upon by Victoria Joseph who offered a different explanation. She claimed that in general when you apply for a job there are two pay scales operating, the published version and what she described as the ‘invisible’ version. She said that she had evidence that women fare less well in civil engineering in a competitive job market:

“because of the Equal Pay Act the current generation of graduates has a completely different view, they expect things to be fair but I think it is very much more difficult for girls to argue their case than it is for boys. Girls have got to be taught to go out and compete”.

Explanations of gendered pay differentials discussed in Chapter Three include human capital theory and comparable worth theory. The first argues that women are paid less than men because they invest less in their careers and experience intermittent labour force participation. The second highlights the belief that employers systematically underestimate the value of women’s labour. Looking at the qualification and employment record of the participants, it is difficult to invoke human capital theory as an explanation for their inferior pay position. Jacobsen (2003) adds another perspective that suggests that different forms of human capital may lead to different earnings rates specifically because the attributes that comprise human capital attract different social value. For example, women who have excellent human capital in terms of education and training may also have interrupted work histories that may reduce their value to employers. I think that Jacobsen’s merged and adapted version of both theories may thus be more appropriate in explaining the gender pay gap.

Cockburn (1991:105-137) considers this in relation to the position of women within different types of organisational structures and concludes that although gender is a pivotal factor, sex-equality struggles are mediated by class and race, though these last two factors were less significant for my study. Powell (2003) argues that earnings differences between men and women are the result of discrimination which she characterises as a demand-side explanation. The question of why women put up with this discrimination remains. Women have less access than men to positions of

authority and my findings show that it is this factor, more than any other, that continues to marginalise women. Even those women who do make it to the top have their authority questioned, as two women directors in the study made clear. Cohn summarises the problem thus: *“often women or minorities, upon achieving high organisational rank, find that enemies attribute their rise to race or gender rather than to talent”* (Cohn, 2000:136).

Many women will undervalue themselves in terms of the salaries they can command, though the precise reasons for this will vary. Rewards from working are varied but evidence from my data indicates that job satisfaction, intellectual stimulation and challenging projects are all expected to form part of the remuneration package for women in a way that is not expected for men. One explanation of the higher salaries paid to men is the primary consideration given by them to negotiating the best possible salary, not just at the point of joining an organisation but also as they progress through the ranks. This is consistent with the general assertion of Langford et al (1995: 180) that men are more likely to be concerned with quantitative and women with qualitative aspects of life.

With only three dissenting voices, the overall belief was that they were receiving equal treatment with male colleagues in the industry in terms of pay parity. How accurate this perception is, in light of the practice of keeping individual salaries confidential and the industry pay findings reported by the NCE, is open to debate. This perception of equality of treatment does not seem to be borne out by the presence of women in the boardroom. While companies are allowed within the law to maintain a confidentiality policy about comparative salary levels, it is difficult then to see how equal pay legislation can be effective.

(iv) Promotion and advancement

Closely linked to the pay issue is the matter of promotion and advancement, not just with a current employer but also moving from one company to another, and here again there was a general agreement that in the main women are treated fairly. There were one or two oblique references to uncertainty about why a particular appointment had been made within a group, or why opportunities for progression were slow, but participants did not see these incidents as important and did not view them as discrimination or exclusion, at least not on an individual level. More significant, though, was the personal career history of one woman, Wanda Jessop, a prominent

civil engineer who had worked on a number of high profile projects. Her professional progress had been blighted by what she characterised as “*invisible prejudice*”. She felt that equal opportunities policies within the organisation she had just left and, where she had spent the greater part of her career, were weak operating only on a token basis.

She spoke with much knowledge about the business, especially the creative side of the industry, and how civil engineers contribute to the aesthetic nature of the built environment. Her critique of civil engineering was unusual but fascinating because she was the only woman in the study who, in terms of how she saw her role, made the link between civil engineering and architecture. Wanda spoke with deep disillusion about civil engineering, which she described as being “*intrinsically aggressive*” and deeply “*political*”. Her interpretation of equal opportunities seemed to be directed towards treating individuals fairly and this is illustrated by her comments that follow:

“I always wanted to be treated equally with other people. If I saw someone who was made an associate and I wasn’t then I would say to myself was that fair? I was made an associate director, well it was called project director at that stage, the moment I came back from LA because I had been a principal there so that was obvious. Again they never actually made me a director and I know that that was unfair. I am different and I think that people promote people who are a bit like themselves. When you look at it they haven’t promoted as many structural engineers, they have only promoted one to director level and she is a manager as opposed to a designer. She is not quite so threatening and you know in some ways I think she ends up as the person who is doing the donkey work as opposed to the creative work. And also I hate to say it but the women who have been promoted in the mainstream they are all blonde, thin, really it is pretty noticeable”.

Wanda felt that image, both corporate image and the image of the individual were the key:

“I think a lot of it is image because the men don’t admit it, they don’t admit it at all and they can point to the fact that the company takes in a very high percentage of women and they give very good maternity and all of that so you can’t fault them on any of that but it is a male environment and particularly at the top. There are no women on the main board”.

This seemed to get to the heart of the problem; if companies have ‘paper’ policies which are seen to be in place, there is evidence that in practice this is regarded by employers, and some employees, as good enough. Several women said that this was the position within their own organisations. This situation reflects Cockburn’s (1991) analogy of the ‘short agenda’ for equal opportunities implementation that takes a minimalist position in relation to minimising discrimination in recruitment procedures

aimed at basic or token statutory compliance (see Chapter Three). Such policies are not conceived as instruments of radical cultural change and can be explained as a basic or satisfactory compliance strategy. If women are prevented from moving into positions of power within organisations because those at the top are intent on reinforcing the male hierarchy, then paying lip service to equal opportunities is in fact all it is. For Wanda this was exactly the issue:

“well it is a classic glass ceiling. I think it is. When you are younger in that firm you in a way don't feel that. I always felt very grateful that I had this job in a way and you know I was given lots of opportunities but as you begin to progress you notice the difference. Civil engineering is very aggressive and I found that I can't deal with aggression, I really can't. It reduces me to tears in a second. The problem I had over a job in Germany arose because one director was getting his own back at the director of my group. I definitely paid a price. You know I nearly went under. And having been through that and dealt with horrible aggression over it I found out it is like you know an allergy or something, it has been triggered now and if anyone is angry to me I just have to walk away now. I mean I didn't sleep for years, I was just broken”.

Wanda explained that she was not the only employee from her firm to be traumatised by intolerable stress. She said that this was much more extreme during the recession in the late 80's and early 90's and several of her colleagues were deeply affected by what she described as *'conflict ridden and competitive work styles'*. For Wanda, the company's equal opportunities policy, of which it was very proud, had failed her. The policy, she claimed, was not endorsed by the hierarchy and did not provide employees with a clear avenue for addressing concerns about promotion and 'grading'. Valuing difference had not formed part of her experience of the profession. She pointed out, though, that through her contact with others in the business, she knew of other women having similar experiences and she quoted one well-known woman in the industry as saying that women are just voting with their feet. Wanda's view was that more and more women will do this until flexible and co-operative work practices are the norm, and more women are visible at the top. My findings generally do not support this claim that women are considering leaving the profession though some seem to be continuing their careers amid a sense of growing disenchantment with working practices.

(v) Summary

None of the participants mentioned the formal recognition or benchmarking of diversity or equality issues within their organisations. Initiatives like IIP, for example, did not figure in the accounts at all and my research seems to suggest that awareness

about these types of issues within the sector is generally not high. For those companies with an equal opportunities policy in place, the responsibility for this fell to the human resource (HR) function and this emerged as part of the problem. There was almost universal disenchantment expressed about HR departments: in all cases their performance was described as weak, ineffectual and at best indifferent, in terms of supporting and developing staff.

I referred earlier to the 'network' way of recruiting staff which reflects the principle that it is who you know that counts. If open and transparent procedures are set in place to hire employees but these are circumvented by senior staff for expedience, it is difficult to challenge this within an equal opportunities framework which has only limited use and does not have the commitment from those at the top. Some participants suggested that maybe those who are excluded from the network should abandon the equal opportunities struggle and try to tap into these networks of connections to ensure that they are not left behind all together. This is based on the 'if you cannot beat them, join them' principle. It seems that networks reinforce existing self-interest, so that those in powerful positions keep the best jobs for themselves and those like them. This is a cynical and understandable reaction from the women, some of whom were 'tired' of seeing fragile equal opportunities policies openly flouted and circumvented by those in powerful positions. Challenging bad practice in these areas did not come across as viable for most women, and the alternative position of having better policies, effectively implemented and monitored seemed a long way off.

The last two sections of this chapter now go on to consider other support strategies that exist to provide practical encouragement for both men and women in the workplace. Recognition that formal equality policies are of limited value makes these more informal measures a common feature of the contemporary workplace across a wide spectrum of industrial and professional activity (Williams, 2000: 213).

4. Role models and mentoring

The interviews discussed the degree to which role models can act as agents for change and also the nature and extent of support structures that exist to retain women entrants. Consideration of these issues produced some of the more unexpected findings.

Six women were over forty-five and for three of these in particular (Susan Hamilton, Victoria Joseph and Wendy Johnson), I was struck by the loneliness of their early careers. They responded with some surprise to the question of female role models acting as a support in their early careers. They explained that simply none existed, and that any encouragement or sponsorship of their progress was provided by male colleagues on an ad hoc basis. In this respect, they spoke to me of their experiences as pioneers in a man's world, which they saw as full of opportunity and new challenges, particularly with regard to establishing the professional credibility of women, who had for so long been denied full membership of the club. Both Susan and Victoria described their personal progress in the profession, and how gradually they sought ways of gaining more influence. The route identified by them both was via the formal organisational structures of the industry such as the ICE and the Construction Industry Training Board (CITB). They regarded their 'equalities' work as agents for change but there was not complete agreement in their accounts about the type of change needed or the best way to approach it. On closer examination, these differences seem to be of style rather than substance. One area of common agreement was the need to work within the structures of the profession, offering constructive criticism. Standing on the outside and 'heckling' from the margins was felt to be futile and these women seemed to reject a 'bottom up' approach to achieving change.

A recurring theme, particularly from the older women, was the informal nature of the encouragement they received from male colleagues, especially in the early part of their careers, when the Human Resource Function (or Personnel Department as it was then called) was principally a recruitment department. These comments from Susan Hamilton were not untypical:

"in one of the companies quite early on in my career there was a man in the training department and he tended to spot the up and coming brightest and would just get you along to his office and interview you and talk about things and make little suggestions about what you might do. You felt that you were a bit special and there was this kind of support. That is the closest I got to mentoring then".

Wendy Johnson confirmed that when she started out more than thirty years ago there were no support structures in place at all and it was only many years later that she recalled having an informal access arrangement with a colleague whom she described as a 'personal partner', someone with whom she could share concerns about work. Victoria, though, had not received any special encouragement but seemed not to

expect it or even feel the need for it. As a result, she had forged for herself a very independent working mode and she was clear that she had benefited strongly from this: *“I mean it has always helped me having this experience of being the first one to do things”*. She reflected how much easier it is now for women entering the profession than it had been for her nearly thirty years earlier.

A majority of interviewees spoke, in general, of the special help and encouragement they had received from a colleague, usually a senior member of the profession and likened this to the role of informal mentor or supporter. With only two exceptions this support was provided by male colleagues and in all cases it was recognised as having made a significant difference to their careers. The types of support described varied, but a ‘coaching’ model was one type of support, whereby women were given opportunities via their mentor to learn through practice. One woman regarded one of her senior colleagues almost as a personal professional advisor. Several women suggested that the support of these men was rather akin to them ‘breaking ranks’ both with other men and with a culture of exclusion. There is no reference in the accounts as to whether the men saw their actions in this light, though a significant factor must be that individual support offered in this way could only be effective if those providing it are themselves connected to mainstream power channels. Their role, thus, acts as a bridge linking those on the margins to the central sphere of influence.

Sharing knowledge and the ‘tricks of the trade’ accumulated often over many years, was seen as an important contribution towards building both the confidence and competence of the women as a preparation for success. Mentoring relationships, particularly between a man and a woman, can be emotionally complicated but none of the women seemed to have experienced this difficulty. The type of benefit derived from mentoring varied, from reducing the sense of isolation to direct promotion opportunities. Karen Shaw, who has a very senior post in a high profile public sector agency, described this as *“he really looked after me”*. This type of sentiment was echoed by several other women in different ways. This raises the question of how an individual route of ‘favouritism’ fits with equal opportunities though none of the women made this connection. Some accounts have a resonance of paternalism about them. Helen Zell, for example, explained that a key supporter in her early career treated her as an *“honorary daughter”*. None of the participants characterised the special help they had received as paternalistic and did not seek to justify it.

Nine women were employed by companies that have a formal mentoring system in place. Such arrangements can be seen as 'top down' agents for change and, in relation to these cases, were endorsed by senior management. These structured support systems had only been up and running a short while, so it was difficult to evaluate their success. This is not surprising, as mentoring has only started to be formally incorporated into Human Resource systems fairly recently. The HR manager, Brenda Cole, suggested that mentoring can be a major factor contributing towards improved retention rates. In particular, she felt that having a "buddy" as soon as you joined the company was significant and this measure had been introduced within the broader "coaching" or "mentoring" framework. Her view was that for this support to be effective clear information has to be supplied to "buddies" in the form of a "buddy pack" so that roles and expectations are understood. In Brenda's company buddies stay in place for three months and then after this period the new employee transfers on to a mentoring scheme and although not compulsory, every staff member is encouraged to have a mentor. Guidelines for mentors are supplied in the form of small laminated 'check list' cards, obviating the need for lots of paper and this apparently is a key feature of their user friendliness.

Two women whose companies had not introduced this kind of support structure spoke about how vital they felt it was, especially for women. They regarded it as a way of establishing confidence and building networks outside the day-to-day routine beyond line management. This is consistent with the findings of other researchers (see Chapter Three and Druker and White (1996) and Evetts (1996). Interestingly, when asked whether there should be a support framework especially for women, the general view was that this would not be helpful, because it might establish a type of 'separation politics' within the workplace and so become another way of signifying 'difference' with consequent negative impacts for women.

Five participants have the position of company main board or associate director and one who is a director working for a contractor, Wendy Legate, described how one of the first initiatives she implemented in her new post was the creation of a mentoring system across the company. She identified this as a way of retaining staff and giving practical meaning to the ethos of personal career development for all employees. This is an example of how being in a position of power can really effect change. Another director, Miriam McClean, spoke about the difficulty she was having in getting other

directors to listen to the case for introducing such a scheme. She associated part of the problem with entrenched attitudes amongst some of her older senior colleagues, all men, citing the fact they could not see the benefits, only the costs. One suggestion made by another director, Wilomena Franks, working for what is generally considered to be one of the most 'modern' and innovative consultants, was the introduction of a counselling scheme for working parents and she emphasised the word 'parents'. She said such a scheme should be explicitly aimed at both mothers and fathers and would be a way of demonstrating that caring should be gender neutral. There was a subtle inference here that such schemes may appear more acceptable if they are not promoted as being exclusively aimed at women. Ideally, she felt that this could be extended to offer support to those who care for elderly relatives. I did not feel able to ask her why she had not herself taken steps to introduce this system. Her technical role did not seem to include these issues within its remit.

Interestingly, only one woman talked about being a mentor: Helen Zell was acting as a mentor to a woman who had specifically requested a female mentor. Helen said that the real issue was access, and she said that she had been able to help in a variety of ways, ranging from giving advice on office procedures to checking calculations and also advising on how to behave at meetings, all very relevant concerns. Susan Hamilton, now well established in her own practice, spoke at length about how she had given detailed consideration to just these sorts of issues as she set out on her career almost a generation earlier.

The general remarks about the usefulness of formal mentoring systems raised the issue of which company function would be expected to take responsibility for establishing such a system. In most corporate structures, one would expect that this would fall under the auspices of the Human Resource (HR) department, at least initially. However, as discussed in relation to equal opportunities in the previous section, this could be where some of the problem lies. All the women who referred to their HR group within their firms did so in very negative terms and the low status of human resource functions emerged as a distinct theme in the discussion on company structures. Comments included their being 'useless' and 'invisible' with 'no role'. The strength of these comments raised the question of what it is about civil engineering that seems to undervalue this area of expertise. The HR unit is regarded as a necessary but often under-resourced overhead (non fee earning) activity.

Operating with this perception makes it difficult for HR managers to be proactive and pilot new initiatives, especially where significant costs are involved. Against this background the approach of Brenda Cole in this area thus seems very innovative and unusual. The success of the work of her unit appeared to be linked to its high status within the senior hierarchy. Specifically, the fact that Brenda was reporting directly to the group chief executive seemed to signal that HR issues were a top priority for the company.

Discussion of role models for women in the profession was closely linked to the theme of mentoring and support structures in general. There was a clear dearth of role models in the industry, particularly female examples. Two participants were themselves identified by several of the other younger women as being powerful and influential role models. The influence of their work in the area of equal opportunities characterised them, individually, as agents for change; words like ‘inspirational’ and ‘fantastic’ were used in this context. Describing the impact generated by one of these role models, Karen Shaw explains: *“she has the strongest belief I have met in anyone in as much that she believes that what she is doing is right with actually pushing equal opportunities forward and trying to make a difference”*.

One feature of the career histories of these influential women was the way that they had joined the institutional and cultural networks of the profession to secure their own personal position but also as a way to lobby for change.

To summarise, the women’s experience of mentoring included a mix of individual or informal arrangements and formally implemented collective schemes. The benefits of each were commented on widely though it was noticeable that the older women concentrated their remarks almost exclusively on informal supportive relationships they had formed to provide them with what they described as advice, feedback and friendship. In some cases the women saw themselves almost as protégés. It was noticeable, too, that these informal mentoring relationships had not been actively sought by the women but rather they appeared to have been ‘singled out’ for special encouragement by a senior colleague. Mentoring relationships that develop between individuals of different power levels can present some degree of risk in terms of potential harassment or exploitation (Fagenson-Eland & Baugh, 2000) though none of the women had experienced these negative aspects. The impact of this individual help cannot be overstated and seemed to underpin the self-confidence of the women in

their professional ability; it also seemed to encourage independence and greater self-belief.

The younger women showed more interest in formal mentoring schemes and several spoke of these as a company-wide arrangement and associated this more with career assistance than with emotional support. Some referred to having a female mentor and how valuable this had been in embedding them in their career by giving them specific guidance about company politics from what Paula Alexander described as *the “female perspective”*. The degree to which these female mentors were in positions of power within their organisations and so able to confer legitimacy on other women was not commented upon.

The reported value of having a female mentor is consistent with findings outlined in an EPSRC publication which showed that women scientists and engineers with female mentors all recounted increases in their motivation, ambition, determination and assertiveness (EPSRC, 2002). The EPSRC report also showed that the women had taken more initiatives to further their careers than they would have done without the support of their female mentor. There are advantages derived from being a mentor and some of the women involved in the projects discussed in the EPSRC report, such as that run at the Bolton Institute, found that they could develop their own careers by sharing ideas with other mentors. This potential benefit was not commented upon by any of the women in my study. One advantage of a female mentor relates to the modelling of successful strategies for coping with gender-based barriers to advancement and work/family conflict. Meena Patel voiced her concern at not having come across any women who could provide this kind of support. This refers to the notion of mentor as role model and only one woman, Wanda Jessop, referred to her male mentor as a role model.

None of the women mentioned the use of mentoring teams as an alternative to one-to-one relationships even though these are now a more common feature of corporate business (Fagenson-Eland & Baugh, 2000). The value of team mentoring can lie in a broader based support framework that is less susceptible to individual tensions. Mentoring teams act as a type of networked support arrangement; other forms of networks are now discussed in the next section focusing on both professional and social networks that impact on career success.

5. Networking

Networks in the workplace operate as a set of connections to foster the interests of those within them. They act as enablers to progress. They also act as a barrier to the success and advancement of those who find themselves excluded from them. Men and women need the help of others to succeed at work and this help is found in a set of relationships or interactions established over time. These job-related contacts can be augmented by other contacts established outside work, but which can also impact favourably on career progression. Networks create opportunities for career enhancement and can take a variety of forms including advice, information, friendship, referrals, support and general guidance. To have within one's network those with power and influence is obviously desirable, but the crucial issue about a networked economy is who is included and who is left out and what determines who should be in which camp. My findings suggest that civil engineering has a strongly networked culture, so that employers recruit staff through these networks, taking on people who come with a seal of approval from trusted sources. This happens in other professions and is understandable, particularly as CVs and application forms do not tell the whole story about what an individual has to offer. In civil engineering, the skills required of the professional have broadened to include both technical and 'softer' social skills such as presentation and interactive ways of working. The personal qualities of an individual can be difficult to assess in a formal interview setting; so bypassing the practice of forms and interviews and simply hiring staff through a networked recommendation can seem attractive to employers. Looked at in business terms, this approach to recruitment reduces the risks inherent in an open selection process and can cut administrative costs but this clearly has implications for equal opportunities, particularly in perpetuating the existing male-dominated hierarchies.

The gender composition of the network will vary according to one's job and the level attained and will be affected by one's own gender. Men develop networks that include mainly men, whereas women have a better mix of both men and women (Ibarra, 1992). Expectations around how these networks operate are also a function of gender. After-work drinking can turn out to be an exclusive activity as women who have caring responsibilities may not be able to make this a priority. Breakfast meetings and long lunches fall into the same category. Regular sporting activity provides another

opportunity for sharing information. Women's and men's career paths differ because women tend to make more adjustments to accommodate family life. The amount of time women spend on reproducing the family reduces the amount of time available to invest in developing and maintaining work-related networks. The other side of the 'network coin' though is the need for working mothers to establish other kinds of social networks outside work, usually with other women and family members, to ensure a mutual support framework (see Chapter Seven). It is these other networks that they seemed to value so highly and describe with much pleasure and enthusiasm. Most of the women in the study socialised very little with work colleagues and those with dependent children socialised the least of all, with lack of time being the critical factor. Wilomena Franks put it thus:

"I think that my social interaction is pretty limited compared to some. There are people who are always drinking with their friends and they do that quite a lot. I have never really done that very much, partly I am not a big drinker and also I have got things to get home to".

Women without caring responsibilities expressed more interest in work based social activity but seemed to restrict this to 'the occasional meal out' or the 'Christmas do' or a gathering at the pub on the 'odd Friday night'. The impression strongly conveyed in the accounts is that having a laugh and a chat with colleagues once in a while at the pub is pleasant but not a priority. This emphasis was similar for most of the women, irrespective of their personal position. Rather pointedly, five of the women said that apart from attending the company Christmas function, they had never socialised with colleagues because they just did not want to spend their time in that way.

The pub is very much a part of the social ritual of construction and many of the interviewees commented on how, although never formally excluded from this activity, they tended not to go very often. Reasons ranged from having better things to do to feeling slightly vulnerable, being possibly the only woman in the group. Thus by default, the outing to the pub is preserved as a protective male ritual and the news and information exchanged there may not be passed on to those not present. This is how networks privilege those within them and disadvantage those outside them. Only a few participants seemed to be aware of how important these networks could be in affecting professional progress, and several had deliberately chosen not to take part, rejecting what one woman described as the 'boozey culture' of the job.

Helen Coates had consciously chosen to distance herself from this form of activity. Her reasons centred on her perception of the outing to the pub with one's colleagues as constituting a form of work. She felt that she had had enough of work in the office and was keen not to extend this yet further to encroach on what she saw as her '*real, other life outside work*'. These sentiments formed part of the accounts of the five directors who featured in the study and one in particular explained why she deliberately chose to withdraw from any socialising with colleagues, apart from formal company occasions:

"It's a deliberate move on my part to be honest. I feel that it is important not to compromise myself and I feel that if I was in a pub on a Friday night drinking and talking I would be pressed for information which may be confidential and I don't really want to be under that sort of pressure".

This raises the issue of the boundary between work and non-work time. For several participants, taking part in social activities with work colleagues, clearly constituted a form of work and contributed negatively to work/life balance with this type of networking perceived as personally unproductive.

Wendy Johnson found socialising in general rather difficult and felt that it was even more of a strain with work colleagues; this did not seem to have hindered her professional progress. Indeed, I was struck by the extent to which the most senior women in the study had chosen, in the main, to keep their working and social lives separate. This does not mean that they had no other forms of networking but it is clear that strong social links with colleagues had not formed a basis of their success.

Whether they would have achieved their senior positions sooner if they had had such links is impossible to judge. A much stronger impact on their success had been the informal support and encouragement they had received at different stages of their career which has been discussed earlier. This theme of a more personal network was in evidence in many of the accounts and maybe this is indicative of female ways of interacting.

The importance of networking as a career development tool was recognised by the interviewees, but it seemed that only the more senior of them felt that they had benefited from this. Some women seemed to be part of several networks connected, for example, to projects they were involved with or to activities undertaken as part of trying to become chartered. Being part of a network was regarded primarily as a 'comfort' (Helen Zell) or support structure but was also seen as a way of affecting

change within the industry. Again it was the more experienced participants who commented on this feature of networking and Pauline Jenkinson was sure that women would need to “*steep themselves in these networks*” if they were to have any chance of making changes to the way that business is conducted.

A contrasting picture was conveyed by the younger women who were generally more uncertain about how to access these networks or begin to create them for themselves. The intrinsic nature of networks held different meanings for participants with the more senior women identifying these as both power (instrumental) and social networks. For women who may have interrupted career paths, establishing and maintaining work-based networks can be difficult. Geena Amrouni, for instance, having taken only six weeks maternity leave for the birth of her first child, explained that she felt that she could not be away from work for longer, because her position would suffer and she would become an outsider. (She holds the post of Group Head within a public sector research organisation.) Others spoke about how important it was to keep in touch with what was going on at work and of how having a network of contacts was instrumental in this process. Geena’s network of contacts included members of the senior management team as well as the receptionist and the post room assistant. The key ingredient of the network seemed to be open accessibility that enabled members to share informally news and views about what was going on within the organisation.

Penny James, who works as a director within the same organisation as Geena Amrouni, commented on the existence of ‘the grapevine’ at her place of work, which she saw as the most likely route for information and misinformation to travel round. Her view was that finding some time to chat to colleagues with whom you may not work directly was useful. Keeping up or even ahead of the grapevine was a way of avoiding unpleasant surprises. In response to the question as to whether this sort of information exchange was actually gossiping, Penny thought it probably was and added “*men like gossip as much as women, they just call it networking*”.

An article in the Guardian (18 June 2001) reporting the findings of an American study which found that men gossip more than women concluded that men and women gossip for different reasons. ‘*Women gossip primarily to bond with one another, while men do it to bolster their own self-esteem.*’ The very word ‘gossip’ carries negative connotations particularly as it usually has a third party as its subject but, as the article

points out, it is the perception of its usefulness that is important. Men and women gossip with each other too, even if their objectives are different. Penny was of the view that it was male/female gossip within her organisation that sometimes filled the information gap arising from the more formal communication structures which she saw as being largely inadequate.

6. Conclusion

The issues discussed in this chapter point to the significance of cultural factors in affecting the potential for change within the profession, specifically the sense that change imposed from 'outside' would not work and only negotiated or consensual change would be likely to succeed. This is why a few of the participants have chosen to become involved with various activities undertaken by the ICE, believing that influencing policy and practice is only feasible as an 'insider'. The issue of exactly what type of change could be achieved was addressed in limited terms with participants concentrating on more tangible or substantive concerns such as flexible working, safety issues on construction sites and a reduction in sexual harassment. Changing the deeper behavioural aspects of the profession in relation to its adversarial nature and the entrenched '*male clubiness*', both features of its subculture, was felt to be more difficult and certainly was regarded as a longer term project dependent mainly on more women entering and staying in the industry.

The sense that civil engineering operates in its own separate sphere according to its specific cultural precepts was a powerful theme of the women's narratives. Thus, the overwhelming view was that transformative change can only be generated by 'insider activity' mainly involving 'top down' initiatives (Greed, 2000). A small minority felt that the wider influences of mainstream concerns about equality issues would impact positively on the profession but would need to focus on the full range of diversity, not just gender. Attaching a feminist banner to the equalities cause was perceived as being counter-productive, perhaps because the participants did not themselves identify in this way. Supporting further equality work was not considered either relevant or important for a majority of the interviewees.

Despite the general indifference expressed towards strategies for improving the profession (such as equal opportunities for example), some participants have themselves become involved in activities aimed at changing the profession and specifically at improving the position of women in the industry. Their efforts have

variously contributed to the formal 'equalities' work of the ICE and other 'top down' change programmes, such as 'Change the Face of Construction'. Susan Leyton, for example, particularly concerned about the experience of women candidates taking the ICE's corporate professional review, has now offered her services as a reviewer to the Institution specifically to improve the qualitative experience of the review for women. Some of the senior women have acted as role models for younger women in the profession and others have been instrumental in establishing mentoring schemes and support networks for both men and women, but several with a core aim of promoting women's career advancement.

The accounts also reveal that although the women generally acknowledged the need for the profession to change and modernise this did not extend to them necessarily empathising with or supporting other women or directly associating themselves with initiatives aimed at creating change. All the women felt that civil engineering functions within an aggressive and personally competitive environment and that there is little transparency in recruitment and selection processes. Furthermore, they felt that women come off worst in this adversarial and opaque culture. The view of a majority was that unless they ensure that they are part of the right cliques, they really stand no chance at all. A small minority, however, felt that they had to reject this 'winning' culture all together, not because they could not win but because they could not start the race on equal terms with male colleagues. For these women the options seem clear; leave the profession all together or take the business risk of setting up in independent practice.

Chapters Five to Eight have documented the main findings of the research analysing the data according to the three themes of subculture, work/life balance and agents for change. The analysis has concentrated on why women enter the profession, how they progress within it and a range of cultural factors affecting their success. The presence of a powerful, but often hidden, subculture that focuses on a culture of 'presenteeism' which is underpinned by conflictual styles of working, is experienced by women as a barrier to their progress. These factors impact negatively on work/life balance. An underlying theme, therefore, of the findings is the relationship between work and family, not only how women negotiate the balance between the two but crucially the expectation of society that it will be women who 'care' for the young, the elderly and the vulnerable. Discussion of possible measures to change the profession, or as one

participant explained to 'civilise' it, has revealed that women may not be eager to contribute their energies to this cause. Much uncertainty exists about what type of change to pursue and which measures are likely to be effective. The next chapter draws these threads together as a conclusion to the thesis.

CHAPTER NINE

CONCLUSIONS

1. Introduction

The research explored women's experience of working as civil engineers in order to understand the extent of change and continuity in working practices within the profession and how this impacts on the participation, retention and progress of women. The prospect of generally improving the way the industry operates and its associated working environment was another focus of the research. Given the falling numbers of men and women entering construction professions, the working environment appears to be problematic in attracting a high quality work force (Langford et al, 1995).

The theoretical framework discussed in Chapter Three focused on private and public patriarchal structures to explain women's subordinate position in the labour market (Walby, 1990). These patriarchal structures were considered in relation to the three themes of subcultures, work/life balance and possible agents for change. The research findings suggest that these structures remain in place but are dynamic and therefore there has been both continuity and change in respect of women's place within civil engineering. In particular, the relationship between work and home makes women's role different from men's in relation to the subcultures of the industry and to work/life balance.

A feature of the work experience of women in male-dominated professions is that they continue to be marginalised by organisational cultures that are underpinned by the paradigm of male success models. The inference is that if women are to 'fit in', then they must adapt to the demands of corporate culture, which generally mean long hours and a sense that work comes first. This suggests that women in the profession implicitly believe that by obeying the rules set in place by a male hierarchy they can have the rewards that men have. An alternative approach is that women stop adapting and competing with men on these terms but rather become active participants in transforming the culture. My research shows that this alternative is a long way off in relation to the UK civil engineering profession because, although women are participating in greater numbers, and have gained more recognition, they are still under-represented at the top and the middle ranks and, thus, do not have the power to affect transformative change. However, the position is more complex and contradictory.

Changing the culture of the profession did not seem to be a priority for a majority of participants who appeared to be 'locked in' to 'male' ways of working that placed corporate interests as a high priority. They appeared to have very little choice but to conform by adopting these male work patterns even though some were clearly pioneers in establishing women in professional roles. The conclusions that follow are set against this background and are discussed in relation to the key themes identified earlier: subcultures, work/life balance and agents for change.

2. Subcultures

The concept of subcultures within the workplace includes behaviours, attitudes and practices that are expressed at an individual and organisational level. These involve meanings and assumptions that are taken for granted, seen as natural and are difficult to question (Alvesson and Billing, 1997). The literature refers to professional subcultures which place emphasis on exclusionary mechanisms as a way of protecting elite specialisms (Abbott, 1988). Within construction a range of subcultures exist. These vary according to professional discipline, hierarchy and setting but all are male-dominated and marginalise women (Greed, 1994; Eisenberg, 1998). Civil engineering as a construction profession has created an image of being at the elite end of the building process and functions in an atmosphere of conflict, antagonism and blame.

The conclusions that follow show the continuing strength of each subculture and demonstrate their effects on women's day-to-day work experience and career progress. This section focuses on problems of women's isolation and visibility in the context of the construction site, the office and the ICE. The different subcultures have a profound impact on women's careers and the ways in which women experience discrimination are highlighted. Specifically the aspects of visibility, career progression and the role and image of the ICE form the three topics of this section

(i) Visibility

With one exception, all the participants spoke of how much they valued their careers and professional identity, but their accounts of their day-to-day experience of actually 'doing the job' presented a picture of frustration and hard won recognition. Most felt that male colleagues experienced similar frustrations, but that they were not subject to the same personal pressures as women. One particular pressure was the need to work to a closely defined time schedule to ensure that caring responsibilities were fulfilled. This made

some participants feel highly scrutinised and vulnerable particularly when faced with unrealistic workloads.

The experience of most participants was that the long held assumption that civil engineers are men continues. Several referred specifically to the unwillingness of male colleagues to recognise that women have a diverse range of skills to offer the industry and one woman put this down to fear that their hegemonic position would eventually be eroded. This fear seems to operate within the subculture of the ICE as well as the construction site. This is illustrated by the action taken by the ICE, described by Miriam McClean that placed women in vice-president positions but decided to make these 'non-succeeding' posts. Miriam said that however this was justified by the ICE, it nevertheless 'felt' like discrimination. Greed (2000) comments that one male construction manager confided to her that he felt threatened by women entering the industry. My research supports this with several participants explaining adverse reactions from male colleagues to their presence on site as men fearing that eventually "*women would take over*".

Closely linked to this sense of isolation was the visibility issue. As Whittock (2000:177) points out, '*tokens capture a larger awareness share*'; this leads often to intense scrutiny by the dominant group, so that those who are being observed in their minority role experience overwhelming pressure to perform successfully. Nearly all the interviewees commented on the stress this caused. Working on construction sites can still be a harrowing and threatening experience for women. Increasing numbers of women in professional construction roles has not made them feel welcome on site and health and safety problems continue.

Because the stereotype of engineering as a male activity continues, women who are visible because of other roles they have are made to feel different. For some with caring responsibilities their perceived lack of commitment to their careers caused them to be singled out by male colleagues. This was contradictory, however, as they were also criticised for 'leaving' their children when they worked long hours to cope with the demands of their role. This supports research on women in other professions and Evetts (1993) notes that this type of commitment can be viewed as deviant and unnatural in women professionals in a range of occupations. This illustrates that whilst women have been admitted into the profession in increasing numbers, this should not obscure the continuing significance of patriarchal relations in the workplace which ensures that once

there, they remain subordinated. Walby (1997: 163) discusses this within the context of the 'backlash' to feminism which she sees as taking different forms so that areas where women have made progress, such as employment, for example, still continue to operate on gendered lines that privilege men and disadvantage women. Thus Walby argues that understanding the extent and nature of women's progress in society is complex "*because the notion of forward and backward for women is insufficiently theorised*" (Walby, 1997:164). It was generally the older and more experienced participants who were aware of the contradictory position of women in the profession which meant that although there is a stronger visible presence of women in professional roles it does not follow that they can access organisational power. This confirms that although there are changes in the participation of women with more in technical roles, power within the profession continues to be held by men.

(ii) Career progression

In evaluating any career choice, the potential for advancement is always an important factor. Many of the interviewees reflected on the optimism with which they had entered the profession and, with only a few exceptions, how this had turned to cynicism as they discovered that the career ladder that men could move along fairly naturally did not function as readily for a woman. Those in leadership positions spoke of the stress of heavy scrutiny and of being compared with senior male colleagues. This resonates strongly with Cockburn's account of women working in retail: "*what appears to be happening here is that men are warning off women, warning them not to compete with men for promotion and authority*" (Cockburn, 1991:69).

Participants believed that senior male colleagues often tried to undermine them and seemed to be threatened by them. The experience of Wanda Jessop and Susan Hamilton recounted earlier illustrates how this hierarchical tension operates and demonstrates that men are concerned about losing out in the promotional stakes to achievement-oriented women. Several comments were made concerning "*progressive younger men joining the industry*" who were seen as holding more enlightened views about modernising the profession. Dainty et al (2000) caution against this optimism by warning that these younger men are likely to be indoctrinated by senior male colleagues and encouraged to adopt mainstream attitudes that maintain the status quo and making them part of the establishment. I share this view and Susan Hamilton commented that, in her experience,

young men in the profession are soon overtaken by the dominant culture that perpetuates existing male hierarchies.

Becoming chartered is a vital professional goal and increasingly an individual's progress in the industry can be seriously limited without this accreditation. For many, their experience of the 'chartering' process was far from straightforward. The research points to the need to ensure that professional review panels include some female members. For several interviewees, the all-male panel was experienced as an obstacle, casting doubt on the 'fairness' of this final part of the process. This highlighted the essentially subjective nature of the interview that some felt left it vulnerable to discrimination and arbitrary outcomes. They felt that the procedure cannot be wholly trusted and what matters is that the process is seen to be fair by candidates.

Becoming professionally qualified was seen by the women as a matter of acquiring the stated criteria and necessary experience. However, the reality of this process seemed to them also to be about self-presentation and this, more than some of the technical criteria, appeared to influence the outcome.

Another perceived requirement for long-term career success was the move into management. Many felt ambivalent about this. A prime concern was the degree to which a management role would draw them away from grappling with engineering problems and draw them more towards a strategic role, dealing with 'people' issues and budgetary management. The view of all the interviewees was that this is an inevitable process in civil engineering, so that organisational success usually means becoming separated from the scientific discipline. Some particularly enjoyed the challenge of doing calculations and technical problem solving, so the prospect of organising others to do this and adopting a much more strategic role did not hold universal appeal. Dainty et al (2000) found similarly in their study with women's preference to stay close to their technical work and chosen professional role as a crucial factor in influencing the career path of some women in construction. These women derived greater satisfaction from these technical roles and saw this as an opportunity to demonstrate their competence to male colleagues.

The possible negative effects on work/life balance resulting from the pressures of management were instrumental in some participants choosing not to take this path. This factor is discussed more fully below.

(iii) The image of the Institution of Civil Engineers

Discussions about the chartering process produced much comment about the role and image of the Institution of Civil Engineers and its impact on the culture of the profession. This professional body was not highly regarded by interviewees; specifically it is seen as outdated, remote and highly bureaucratic. Its failure to modernise and promote diversity is seen as a way of continuing its inherent 'maleness'. One interviewee described it as being '*just an old boys' network*', a sentiment echoed by several others. Despite the overriding criticisms of the ICE, some participants had chosen to be involved with the Institution contributing time to the work of its committees and council. They regarded their contribution as a way of making the Institution and its instruments of governance more accessible to the membership and also as a way of influencing its powerful subculture and future direction. Becoming an 'insider' was seen as vital to having any influence on progressive change.

The most important challenge facing the ICE is how to make its activities and the benefits of membership relevant to young engineers. Much of its active support is derived from older engineers who have not in the main questioned its ethos or practice. Another criticism of its function, shared generally by participants, centred on its failure to raise the profile of civil engineering with the general public. The continuing low status of the profession could, in part, be attributed to its dearth of campaigning for recognition of the industry's achievements. The opportunity to highlight the success of high profile projects (in engineering terms) like the Channel Tunnel and the Dartford River Crossing had been lost. This led several interviewees to comment that an Institution that does not proactively promote and celebrate the work of its members cannot expect to rely on their continued support

(iv) Summary

The findings suggest that there has been very little change to the different subcultures operating within the profession that continues to be adversarial, conflict ridden and underpinned by a culture of working long hours. Women are more visible in engineering roles but remain isolated within a culture that is centred round competitiveness, conflict and the male pub gathering. Women seem resigned to adversarial work practices that are present in all areas. These are deemed more 'acceptable' in some subcultures, such as the construction site, even though they are experienced as particularly raw in that setting. These practices are mediated in the office environment and, as Susan Leyton explained, are expressed in more subtle and sophisticated ways within the subculture of the ICE,

often “*couched in smiles with gritted teeth*”. Generally participants were not optimistic that these antagonistic work practices will substantially improve.

3. Work/life balance

The literature on this topic has discussed the way that boundaries between home, leisure and work are established and maintained and why this issue has been of particular concern to women. Despite legislative and workplace policies aimed at making it easier for people (particularly women) to combine paid work with the rest of life, their impact has been limited (Hogarth et al, 2000). Walter (1999) and Williams (2000) argue that workplaces are designed around men’s life patterns and take no account of workers’ roles as caregivers. On a theoretical level this has crystallised the issue as one of work/family conflict for many women (Thompson & Beauvais, 2000) as well as one of identity in relation to the perceived need to ‘deny’ motherhood in the context of paid work (Brannen & Moss, 1991). At an individual level, however, attachment to paid work has become central to identity with perceptions of self worth closely linked to roles of both producer and consumer (Lewis et al, 2003). Oakley (1997) suggests that the concept of work/life balance is itself mediated by what in reality is a work continuum for most women across public and private ‘spaces’, with women undertaking the majority of domestic work.

Professional subcultures discussed in the previous section emphasise prioritising work and demonstrating a strong commitment to one’s professional role. Within civil engineering this applies to the issue of availability and the long hours culture. This has negative impacts in a variety of ways and some women feel a psychological onslaught from the sense that they have to be seen to be working and any unplanned time off has to be accounted for. For women in management roles the boundary between work and non-work time appears to be dominated by the intractability of organisational work practices (Crompton & Harris, 1999). Women are colluding with male work patterns that mean long work hours and poor work/life balance. The conclusions that follow discuss work/life balance in terms of what were seen as the main problems and some possible strategies to improve the balance. The issues of management, flexible work arrangements and overseas working emerged as key areas of concern.

(i) *To manage or not to manage?*

Although moving into management was identified by a majority of participants as a key career goal, some identified management as unattractive and not sufficiently rewarded.

Some had already embarked on a management career with five participants in 'director' posts and a further eleven in other management roles. Specifically, moving into senior management roles was seen by some as incompatible with work/life balance. Even for those who were keen to develop their management potential, there was a sense that this was a choice forced upon them as the only way to gain recognition and earn more money.

The fact that success almost inevitably seems to equal management certainly created problems for several women; without promotion to managing others, recognition would suffer and one would not be valued as someone who placed their career as a priority. There was a sense that within this paradigm, women would be particularly vulnerable and destined to remain at the bottom end of the pay and status scales. Working what was described by Wendy Johnson as "*sensible hours*" in a management function was felt to be viewed negatively by employers and challenged the subculture of presenteeism which continues to dominate.

The reason why so few women reach senior levels in the profession (for example, there is still not a single UK engineering consulting firm headed by a female chief executive) is due not just to structural discrimination, but also to the reality that women themselves are choosing not to take the management path leading to entry to the boardroom. Some of the participants with young families who had achieved great success early in their careers spoke of their frustration with the system that allowed them so little flexibility in relation to their changed family circumstances and yet still expected so much from them. Negotiating the tightrope between work and home continues to be a central issue for most professional women, especially those with caring responsibilities. There was an overwhelming sense that civil engineering just does not lend itself to variable work patterns. As Davidson and Cooper (1992:132) argue, the conflict faced by many women between the dual roles of corporate manager and family manager can seriously affect their performance in both spheres. Some of the most highly qualified women, and some possibly with the most potential, had decided to take a lateral rather than a hierarchical perspective on their careers, choosing to focus on interesting and varied work, rather than on assuming powerful organisational roles.

(ii) *Flexible working*

Strategies to improve work/life balance, such as part-time or flexible working, were regarded with ambivalence. Policies specifically aimed at women were felt by all

participants to be counter-productive because, although they might benefit individual women, they would serve to position women, as a category, as less committed to their careers. There was a perception that for flexible working to be less stigmatised these kinds of arrangements should be seen to be offered to both men and women. Making this gender neutral is what confers its legitimacy within organisations. There was strong feeling that stereotyping women as having different requirements from male colleagues was unhelpful. Although the rationale for the reasoning can be explained by participants not holding feminist views, it does not acknowledge the different social and material position of women. With only one exception, all the participants who were working part-time were doing so to accommodate caring for their children. Thus, for example, denying that women would like to take maternity leave and may need employers to be supportive of childcare arrangements does not advance women's cause nor does it reflect the reality of most women's choices in respect of their role as carers of dependants. Furthermore, as Greed (2000) argues, women fitting in to the industry on its terms does not seem to have resulted in them being made to feel welcome or in them reaching top positions in significant numbers. Women, therefore, may have little to lose in pressing employers for working arrangements that accommodate their particular requirements in achieving work/life balance though this was not generally acknowledged by participants as a useful approach to improving their position within the profession.

(iii) Overseas working

For some participants their suitability for working on overseas projects was connected to the subculture of the profession whilst for others this issue was dominated by work/life balance considerations. The reality is that these issues are inter-related.

Changes to the business cycle for most consultants reflects the pattern of increased levels of overseas working. In light of this, employers obviously need to ensure that a proportion of their engineers is available to work abroad. It is not clear whether, in the recruitment process, an assumption that women may not be so flexible, or that they prioritise positive work/life balance, actually influences the decision about whom is appointed. Some participants, however, were convinced that the issue of mobility had limited their advancement and may have blocked their promotion into specific jobs, because in the eyes of their employer the relationship between their job and their home life was viewed negatively. This supports the work of Walby (1990), Cockburn (1991) and Rees (1992), who have all theorised women's relationship to paid and unpaid work

with, specifically, women's domestic role in the private sphere limiting their role in the public sphere.

(iv) Summary

At the structural level work/life balance appears to be dominated by the subcultures within the profession. The strategies used by participants to improve the negative impacts of the subculture operate at a personal and individual level and involve a range of strategies such as changing career direction, for example. Strategies are constrained by personal circumstances, the specific organisational context and by the wider subculture. It is important to recognise that work/life balance is a process, which has to be negotiated; it is not static. Solutions are therefore not fixed but adapt to reflect changed circumstances. Linda Cook, for example, deciding to travel by train to work instead of driving, in response to a mounting workload, was a way of transforming travel time into work time as a tactic to improve work/life balance. For many participants the overwhelming impact of the professional subcultures was psychological with the strain of negotiating boundaries between what was characterised as the relentless treadmill of the industry and non-work time, as pre-eminent.

4. Agents for change

Agents for change comprise top-down industry initiatives, mainstream equalities measures, bottom-up grassroots activities and formal and informal support mechanisms. Some agents function as collective action in the form of policies and formal initiatives whilst others operate as individual responses to the male-dominated culture of construction. The conceptual framework developed by Greed (1998, 1999, and 2000) has informed the analysis of what change can be expected. The possibility that women, as a critical mass, might be an agent for change appears unlikely given the continuing small proportional representation of women in the profession (see figures in Chapter Two). A further factor is that, as discussed in Chapter Eight, women do not form a cohesive unified interest group with a range of professional and personal differences that divides them. This study shows that women's interests are individual rather than collective.

The prospect of bottom-up change being generated by the activities of groups operating outside the mainstream of construction seems remote. Their work received no comment from participants, not even from those engaged in equalities action. The overwhelming view was that progressive change on a structural level is only likely to result from top-

down insider and mainstream initiatives. This is in contrast to the variety of support and encouragement that, on an individual level, can make a difference to career opportunities and professional development. The summary conclusions that follow reflect this dual approach to change.

(i) Equal opportunities policies

As discussed in chapter three, equal opportunities can be categorised as a top-down change agent originating outside the mainstream of construction. It is a complex concept. Its theoretical base is allied most closely to management theory (Bagilhole, 1997:37) and its implementation is characterised both as ‘equality of treatment’ (policies and practices) and ‘equality of outcome’ (outcomes and results). An underlying theme of participants’ understanding of the issue was the notion of ‘fairness’, particularly *individuals* being treated fairly and, in this respect, their focus was more on outcomes. As far as the implementation of ‘fairness’ on a *collective* level is concerned most had no idea or interest in how this could be achieved, or the role they could have within the process.

Equal opportunities as an issue has a low profile in the industry and the introduction of formal equal opportunities policies has been accorded a low priority by employers. This is illustrated by the fact that two participants who hold director positions were unsure whether their organisations had established an equal opportunities policy. Their response was couched in terms of the importance of treating *individuals* fairly. The emphasis was, therefore, on individual solutions rather than collective strategic measures.

Uncertainty about whether or not their organisations had an equal opportunities policy in place was in fact voiced by a majority of interviewees. The impression given was that such a policy was not valued, and cynicism was expressed about whether such statements can be effectively implemented or monitored. Generally, no clear connection was made between the lack of an equal opportunities framework in the profession and the ‘poorer’ position of women and specifically their under-representation at senior levels. This seemed to be the case equally amongst both the consulting and contracting arms of the business. Barbara Bushell, project manager with the organisation ‘Women and Manual Trades’ commenting on the role of women within construction in general, cites the issue of equal opportunities as being at the heart of the matter:

“women have been ready and trained for work for the last twenty five years but the old-boy network still rules. The industry seems to be less regulated than others in terms of

equal opportunities; I never saw an equal opportunities document in any of the companies I ever worked in" ('Weekend' Guardian magazine, 30 June 2001).

The establishment in June 2000 of an Equal Opportunities Forum (ICEFLOE) by the ICE goes some way towards recognising this and signifies some progressive change. Taking Cockburn's (1991:216) framework of the 'short' and 'long' agenda for the implementation of equal opportunities measures discussed in Chapter Three, the understanding of what is a minimum position is characterised as the former whilst the latter involves more radical and material change. The 'short agenda' is characterised by the introduction of measures to minimise bias in recruitment and promotion and, can be viewed as an attempt to ameliorate informal discriminatory practices. In contrast, the 'long' agenda' is concerned with organisational transformation and goes well beyond the minimalist approach of compliance with anti-discrimination legislation. None of the participants was employed by companies who had adopted anything more than a minimalist equal opportunities policy.

Because the aim of the 'long agenda' is to challenge the culture of organisations, there are real costs associated with tackling this and in an industry where profit margins have been eroded in recent years, this can so easily be invoked as a reason not to act.

However, cost is not the only issue. Most interviewees expressed indifference to the ideology and practice of equal opportunities because they felt either it was not relevant to themselves or to the industry and because they judged it to be ineffective. Women generally within the industry, therefore, may not be the drivers for change and even if their representation should achieve a level of critical mass, continuing indifference to equalities issues may mean that their greater presence may not be change inducing. The few with a deep interest in the issue (like Susan Hamilton for example) felt that the majority of men they had come across in the profession were committed to holding equal opportunities to the 'shortest possible agenda' (Cockburn, 1991:216).

Chapter Two described the privatised nature of the profession that continues with very little unionisation. The emphasis on maximising profit and reducing costs of private sector firms may account for the reluctance of engineering companies to adopt equalities policies that are seen to increase costs, especially in the short term. Michielsens et al (2001) found that the implementation of equal opportunities within construction that included specific encouragement measures to increase the female workforce was more likely to occur within the public sector. It is not difficult, therefore, to see how within a

climate of disinterest, equal opportunities fails to get on the agenda for action and seems of little relevance. This goes some way to explaining why outdated ways of working, such as recruitment systems based on “‘he’s a good chap, I knew his father’ principle” (Greed, 2000: 188) continue and inequality is only very gradually being uncovered and acknowledged.

My research suggests that employers may regard the issue of diversity within civil engineering more as a problem than as an opportunity. Although the focus of this study is gender, a comment was made by one of the participants about a Muslim male colleague who had met with considerable difficulty when requesting a workplace prayer facility. The continuing under-representation of women in civil engineering is part of the wider diversity issue. The challenge of addressing the need for a diverse workforce is being taken up by the ICE which, as a result of research undertaken by ICEFLOE, will be carrying out annual diversity monitoring of its membership.

Two participants who are engaged in promoting equal opportunities policies within construction commented that, in light of the skills shortage, companies’ future success may depend on a more open and inclusive approach to staff recruitment. One of the organisations featured in the research has implemented an innovative approach to staff selection and retention within an equal opportunities framework and has steadily increased its turnover, profit levels and sphere of activity. The view of one of the directors was that the two were not unconnected. Adopting open and transparent recruitment policies is at the heart of this approach. However, this level of equal opportunities implementation represents the ‘short agenda’ to change aimed at eradicating (which in practice means minimising) discriminatory recruitment practices. For many employers in the sector this may turn out to be the extent of their ‘equality’ initiatives and may be regarded as sufficient to meet statutory compliance. My research suggests that a more radical approach to equal opportunities that involves, for example, ‘top down’ change to staff selection and promotion at all levels appears unlikely with the business case for greater adoption of equal opportunities policies being increasingly contested.

(ii) Support networks

Having an ally or sponsor in high places can make a significant difference to career progression and therefore acts as an agent for change on a personal level. Because women still form such a small minority, this kind of help is particularly important in

helping to 'smooth the way' towards promotion and recognition. However, this support is often highly selective and discriminatory, particularly as participants had been 'chosen' or singled out by their patron for special encouragement. This raises concerns in relation to equal opportunities and suggests that those who are not 'chosen' are left out in the 'wilderness' to find their own way. In relation to this issue of patronage one participant used her version of Pateman's (1988) 'sexual contract' to explain why some women make it to the top and others do not. She characterised this as the hidden terms of engagement between employer and employed. Both this view and my findings support the work of Cockburn (1991:61) who sees male sex-right as an intrinsic feature of capitalism that remains essentially patriarchal.

Women civil engineers receive and benefit from support in their work from a number of sources. I was surprised by the diverse nature and extent of these sources, particularly the degree to which career choice had been influenced by the role model of male family members who were engineers. This highlighted the importance of individual and family factors in encouraging women into and within the profession and is consistent with findings of Court and Moralee (1995) that particularly pointed to the role of mothers in influencing their daughters' choice of a non-traditional career.

Many participants had received particular support and encouragement from individual male colleagues who, in most cases, had acted rather like a career sponsor. The men offering the support were in senior positions and thus were able to make a difference when it came to opening up opportunities for the women to work on different projects or take positions of responsibility. This supports the findings of Davidson and Cooper (1992), that confirm that the support of a 'patron boss' can be instrumental in advancing career prospects. Individual women being helped in this way can allow them to be accommodated within the male subculture and explains why, once they have adopted the values of the dominant culture, they are unlikely to challenge it. Langford et al (1995) endorse this view. They argue that because women have had to take advantage of male support and emulate male approaches to work to survive in the hostile environment of construction, they are unlikely to espouse female values that may ignite change to improve working practices

A further effect of this personal, instrumental support for individual women is that noted by Greed (2000). She argues that women, as a category, are unlikely to be a force for change as they are prevented from forming a critical mass precisely because their

experiences, advantages and disadvantages often serve more to divide than unite their interests. My research supports this with the issue of parenthood as a good example. Wilomena Franks commented that as a mother of three small children she found herself making alliances with male colleagues who were fathers and this distanced her from childless females within the organisation.

Whether pursuing an organisational career (attempting to climb a career ladder within one organisation) or an occupational career (moving from employer to employer), networking has been shown to be an important factor affecting progression (Cohn, 2000, Fagenson-Eland & Baugh, 2000). Women are usually perceived as being good at networking, particularly in social relations rather than the more instrumental and tangible benefits associated with male networks (Ibarra, 1992). This skill is socially constructed and is born of necessity, so that women make connections that enable them to juggle careers and family life. However, in contrast, the research suggests women may either not know how to network effectively for success at work or may be constrained from doing this and a majority of participants did not recognise this as in any way important. Three of the older women who had been pioneers in the profession were the exception. Their view was that the younger women did not realise that the battle for recognition was still being fought and was in fact far from won. They stressed the need for women to establish a solid base of contacts across the industry and not to feel shy about using these for one's personal advantage.

This is a major determinant of women's inferior place within the profession as it currently operates. Susan Hamilton argued this most strongly, commenting that civil engineering feels like a club. The credentials for entry have broadened in recent years, but the way that business is transacted and developed, often via a network of personal contacts and informal alliances, continues to make it a closed system, based mainly on 'who you know'. This is an exclusion mechanism keeping out new comers operated through maintaining a lengthy chartering process and establishing a route to promotion which is based more on time served than on individual merit.

Most participants did not appear to network across the industry and found workplace politics generally difficult to negotiate. Those who were working part-time seemed the most detached from the networking process, with time always pressing. There was general awareness of male networks which participants recognised as often functioning in settings such as the gym or the pub. These were referred to with some disdain and a

majority found themselves outside of these circles. Brass (1985) and Burke et al. (1995) found that managerial and professional women are less integrated into important organisational 'male' networks and I have found similarly. Of course it could be argued that networking is in contradiction to formal equal opportunities policies but none of the participants made this link. A suggestion that women form their own support groups was met with considerable resistance by participants as it was felt that this could reinforce the 'separation politics' of the workplace which would increase the isolation of women, not reduce it. There is, however, evidence from the study that women are increasingly making use of networked support arrangements to strengthen their careers, particularly in the form of mentoring.

Mentoring and 'buddying', aimed at increasing staff retention, have recently been formally introduced by a number of consultants as part of the induction programme for new staff. High staff turnover has been a significant problem in the profession, especially as the 'battle' to win an ever-decreasing number of civil engineering graduates continues. Putting in place effective support structures that operate as soon as an individual joins a company has been identified as a useful way of addressing staff problems before they become critical. These structured support systems can be shown to have both personal and business benefits and significantly improve staff retention.

(iii) Summary

Equal opportunities policies appear to be sporadically adopted within the profession and were not highly regarded by participants. These policies certainly seem to have made little difference in securing women's entry into high-status 'male' jobs within the industry in significant numbers. Women's progress is further restricted by the visibility problems facing any minority trying to break into the ranks of a job or occupation held by a majority (Cohn, 2000). This has influenced participants who felt that whilst women might benefit on a personal level from forming 'women only' groups to share experience and offer mutual support, such separate and specific activities would only serve to undermine their collective place within the industry. Participants have different orientations and priorities resulting in the use of a range of support strategies for career enhancement. These operate on a personal and individual level in response to changes both in jobs and stages in the life-cycle and cannot be seen as agents for change in the wider context.

5. Conclusion

The research has focused on enablers and barriers to change and has considered a range of bottom-up and top-down initiatives, all with varying degrees of influence. At the outset I had anticipated that women themselves within the profession would be powerful agents for change. However, the most striking conclusion of all is that, apart from a few determined individual women, women, as a group, show very little interest in actively challenging the structures of male privilege within the profession or transforming its culture. The reasons for this seem to be connected to the fact that, although there is a clustering of women at the bottom of the employment hierarchy within the profession, a few women have managed to push their way into prominent senior posts and this somehow, superficially at least, seems to have neutralised the gender issue for a majority of participants. Many of the interviewees seemed overburdened with immediate obligations to their employers and their families with very little time left for anything else.

Some of the most senior women in the profession are represented in the research and their accounts varied in terms of the degree of difficulty they had experienced in getting to the top. Most of the other women expressed an intention to move into some form of management, though not necessarily at the most senior level, and a few had set for themselves very high goals. One reason given for this preference was that, although individual experience of line-management had been positive, the perception of the general quality of management within the profession, especially project management, is poor with many of the opinion that they could do an awful lot better.

All participants discussed their achievement and aspirations against a background of difficulty or constraint and most believed that they had encountered some type of discrimination or prejudice in their career. Derived from their personal experience, an almost universal view was that most men experience difficulties in working with women as their peers and particularly as their leaders. (The exception was the contribution of individual male mentors who had clearly made a positive difference to the career experience of several participants). Cockburn (1991) and Walby (1990) have theorised this as the transfer of private patriarchy to public patriarchy and my research supports that of Greed (1999, 2000) and Fielden et al (2000) which shows that men expect to be at the top of the hierarchy in construction. A clear message from this research is that women are still not welcome at the top in construction.

It was suggested by Wilomena Franks that the combined roles of mother and high-flying career woman were particularly threatening to some male colleagues whilst being a source of admiration for others. Cockburn (1991:92), in her analysis of women's increased participation in paid labour, found little admiration on the part of men for women's role in the workplace with the issue of working mothers being of particular concern to managers. Langford et al (1995) found that the attitude of women in construction towards career development was contradictory with on the one hand, a clear resistance to feminist ideas whilst on the other expressing concerns about career opportunities and the negative attitude of male colleagues to career breaks for women. The few women in my study who made any reference to feminism all agreed that the women's movement has both helped and hindered women. This dichotomy could stem from the influence of the *backlash* to feminist ideas which promotes feminism as the enemy of women (Faludi, 1991).

Greed (2000) paints a negative picture suggesting that the situation within construction is particularly bad with both disability and pregnancy often equated with incapacity and seen as reasons for leaving the industry. This research leads me to a similar view. Motherhood within the profession is seen as a problem and, for those women in senior management positions, the 'mothering' element within their lives has to be managed seamlessly. The main concern was that any special privileges accorded to mothers would give men the opportunity to claim that women were not fully contributing at work and so undermine their career prospects. To combat this several participants commented that it should be the 'parenting' role that should be the subject of discussion, with an equal emphasis on mothering and fathering. Cockburn's (1991:104) view is that "*mothers' privileges are highly contradictory for women*" exactly because they are gender specific and, although they can be effective in easing the interface between home and work, if they are not extended to men and taken up by them, women will continue to be "*defined in domesticity*" (Cockburn, 1991:76). According to the women I interviewed this applies equally to women at all levels within the profession and very few women are able to escape being labelled in this way, whatever their personal circumstances.

The prospect of struggling to the top of the profession seemed an unattractive option for several participants. They had judged that the price to be paid for success was too high. Consequently they had opted out of the highly competitive management race, choosing instead to maintain a rewarding career but one not subject to the stress of continuous

long hours and working away from home on a regular basis. The anxieties about reaching the top did not revolve solely around the issue of competitiveness; the concerns were much broader. One participant described how able and motivated colleagues had changed as they trod on others in their dash for success. They expressed their dislike of the people their colleagues had become as senior managers, using terms such as 'ruthless' and 'uncompromising' to describe their changed persona. They felt that civil engineering thrives on conflict and competition and that these characteristics continue to underpin the profession. For some working in this environment was experienced as unbearable. Helen Coates' story of disillusion and decision to leave the profession, for example, was very powerful. Others told me of women they knew who had left the industry for similar reasons. It was not possible for me, as part of this research, to chart the numbers of women leaving the industry, but in a climate of worsening skills shortage this must be a cause for concern.

The individual biographies of the women described earlier do not give a complete picture of their professional and personal lives and my final remarks refer to what emerged as a key concern, work/life balance. Most of the women said very little about their leisure interests and only one of the women with dependent children mentioned aspects of her life aside from work and family. I was left wondering how, with so many claims for their attention, these women felt about themselves. As I listened to their stories about ways in which they were managing their multiple roles I got a strong sense of the high value they placed on maintaining their professional identity. Despite this several mentioned that they were investing in their careers now as a way of nurturing the future and being able to look forward to working less intensively and two women hoped to be able to retire early. Whilst several interviewees spoke with optimism about their personal futures, none seemed very positive about the prospects of industry change. My own view is that change is only likely to occur with the stronger implementation of 'equality' legislation and a much more coherent lead from the ICE in relation to operating standards and codes of good practice. On one level with the establishment of ICEFLOE this process has begun, but in an industry that has shown itself resistant to change of any kind, expecting radical reform of its culture and practice in the short term is unrealistic.

APPENDIX I

Participant Profile – Age, Family Circumstances and Professional Position

Patricia Knight

Age: 38. Married with two young children works part-time as a chartered project manager for a mainstream consultant.

Mary Jones

Age: 28. Married with no children, works full-time for a specialist consultancy as a graduate engineer. Is working towards attaining chartered status.

Helen Zell

Age: 37. Single with no children, works full-time as a chartered Principal Professional Engineer for a mainstream consultant.

Susan Leyton

Age: 47. Married with two school age children works full-time as a chartered Principal Engineer for a mainstream consultant.

Penny James

Age: 39. Married with no children, works full-time as Commercial Director for a Government research agency. She became a chartered engineer in 1991.

Gillian Hayes

Age: 32. Married with three young children, works full-time for a Government statutory agency as a project engineer. Helen is not a chartered engineer.

Fiona Kent

Age: 34. Married with two young children, works part-time as a chartered senior environmental engineer for a specialist consultancy.

Melinda Jackson

Age: 35. Married with one school age child, works full-time as a chartered Principal Engineer for a mainstream consultant.

Naomi Gill

Age: 26. Single with no children, works full-time as an engineer for a mainstream consultant. Naomi is not chartered.

Gemma Sales

Age: 33. Married with one young child, works part-time as a chartered Principal Civil Engineer for a mainstream consultant.

Christine Allen

Age: 33. With partner and no children, works full-time as an incorporated engineer at a mainstream consultant.

Helen Coates

Age: 36. Single with no children, works full-time as a chartered Senior Civil Engineer for a mainstream consultant.

Meena Patel

Age: 23. Single with no children works full-time as a graduate engineer with a mainstream consultant. Is working towards chartered status.

Miranda Ellis

Age: 25. With partner and with no children, works full-time as a Transportation Engineer for a mainstream consultant. Miranda is not chartered.

Barbara Bing Turner

Age: 29. Single and with no children, works full-time as a project manager for a specialist consultancy. Chartered status expected within three months of the interview.

Marion King

Age: 26. With partner but without children, works full-time as a project engineer with a specialist consultancy. Is under a training agreement with the ICE.

Wanda Jessop

Age: 46. Single and with no children, has set up her own independent design consultancy. She works full-time in developing this business and has been a chartered engineer for fifteen years.

Linda Cook

Age: 39. Married with one young son, works full-time in a high profile position within the industry. Her employer is a large contractor. She is not a chartered engineer.

Molly Peters

Age: 38. Single and without children works as a full-time academic. She has been a chartered engineer for nine years.

Miriam McClean

Age: 37. With a partner and without children, works full-time as an Associate Director for a mainstream consultant. Miriam is a chartered engineer.

Karen Shaw

Age: 40. Married and with one young child, she works full-time as Senior Project Manager for a public sector agency and has been a chartered engineer for thirteen years.

Tania Forrest

Age: 39. Married and with two school age children, works part-time as a project manager for a mainstream consultant. She is not a chartered engineer.

Wendy Johnson

Age: 56. Separated and with no children, works full-time as Chief Engineer (chartered) for a main stream consultant.

Wilomena Franks

Age: 37. Married with three small children, works full-time as a director of a mainstream consultant and has been a chartered engineer for thirteen years.

Clare Sanderson

Age: 26. With partner and without children, works full-time as a graduate engineer for a contractor. Is under a training agreement with the ICE.

Geena Amrouni

Age: 36. Married with two young children, works full-time as Group Head (Chartered) for a public sector research organisation.

Victoria Joseph

Age: 51. Married with two adult children, works full-time in her own consultancy practice and has been a chartered engineer for twenty-six years.

Wendy Legate

Age: 35. Married with two small children, works full-time as a Director of a contractor and has been a chartered engineer for six years.

Pauline Jenkinson

Age: 45. Single and with no children, works full-time in a senior management role for a utility company. She is a chartered engineer.

Paula Alexander

Age: 30. Married and with one young child, works part-time as an Assistant Project Manager for a mainstream consultant. Is working towards her professional review for chartered status.

Susan Hamilton

Age: 49. Divorced with no children, works part-time in her own practice. She has been a chartered engineer for twenty-four years.

A Research Study

The Career Experiences of Women Civil Engineers in the UK

The aim of this PhD research project is to explore women's experience within the civil engineering profession in the UK in order to understand the main issues affecting their progress. Although part of the project involves a quantitative study of employment trends within the industry, the research will be mainly a qualitative study with individual in-depth interviewing as the main tool of the investigation.

A number of the consulting firms including Binnie Black and Veatch and the Babbie Group have offered their support for the project. In addition both Birmingham and Glasgow University Civil Engineering Departments have asked to be consulted about the findings and have expressed a wish to be involved with the process.

The changing nature of the business for the major consulting firms with a greater proportion of their work being done overseas may influence recruitment patterns. Engineers now need more often than in the past to be diverse in their expertise and flexible and mobile in the application of their skills.

It is hoped that the interviews will highlight the following issues:

- Workplace environment and culture
- Women working in a male-dominated profession
- Equal opportunities policies and practice
- Support networks
- Future business trends and their impacts on women

The status of civil engineering in general and the calibre of civil engineering graduates in particular is currently being hotly debated. The perceived need to raise standards of practice points to the need for the profession to attract more high-flyers to its ranks.

How these developments will affect women coming into the profession and those women already established in their careers is uncertain but they may provide the basis for considerable change and opportunity. It is hoped that the findings of this study will inform the development of the profession.

Jacqueline Watts

PhD student, Middlesex University

APPENDIX III

**RESEARCH STUDY
PARTICIPANT DETAILS**

The following background factual information about yourself is sought to contextualise responses.

NAME:

AGE:

ORGANISATION:

JOB TITLE:

MAIN AREAS OF RESPONSIBILITY:

TIME WITH CURRENT EMPLOYER:

DETAILS OF PREVIOUS EMPLOYMENT:(with approx dates)

QUALIFICATIONS & DATES:

**PROFESSIONAL TRAINING UNDERTAKEN WITH DATES:
(including training not completed)**

**FAMILY CIRCUMSTANCES:
Single/Married/With Partner/Divorced**

HUSBAND/PARTNER'S OCCUPATION:

DO YOU HAVE CHILDREN :YES/NO

NUMBER & AGES OF CHILDREN:

OTHER CARING RESPONSIBILITIES:

CAREER BREAK DETAILS: e.g. maternity leave

APPENDIX IV

Researching the Career Experience of Women Civil Engineers in Britain

DISCUSSION ISSUES/INTERVIEW PROMPTS

1) CAREER CHOICE/EDUCATION

Which subjects did you choose at school

What was your experience of taking civil engineering at university

Why did you choose civil engineering as a career; what were the key influences

Was there any encouragement or opposition to this choice of a non-traditional career from family or friends

Do you see this as a non-traditional choice

Do you have a preference for public or private sector working and why

2) CAREER EXPECTATIONS AND OPPORTUNITIES

Themes and patterns around achievement and attainment generally. What has helped and what has hindered you in your progress but specifically:

Where are you now in the profession and how does this link with your original goals

Do you have any particular organisational ambition in terms of a management role

What training and CPD opportunities have you had – do you value becoming chartered

How do you see the role of the ICE

How has the profession changed in the time that you have been in it

(glass ceiling and 'men only' success templates – consider & bear in mind but do not raise)

3) STATUS, IMAGE, STEREOTYPING AND ROLE MODELS

In your experience how are female engineers seen by male colleagues and also by female colleagues employed in non-technical or 'support' capacities

Do you have female colleagues amongst the technical staff at senior levels within your company; have they influenced your career and do you see them as a role model

Is there an informal/formal mentoring scheme amongst women in your workplace

Is there a formal appraisal scheme in place within your company; if so how is this administered and does this form an interactive part of career development for staff

Do you consider that there are particular segments of the business where women predominate

Do you have social interaction with your colleagues at work/lunchtimes/after work

Do you feel that your work is valued

4) WORKPLACE CULTURE

Does your company have an equal opportunities policy; are women treated equally in terms of pay, opportunity and training

Have you experienced any obstacles to your professional progress (including direct discrimination but also informal exclusionary practices such as unwanted sexual attention in the form of offensive jokes, familiar behaviour, sexual teasing. If so have you ever reported this behaviour)

Do you think that this kind of behaviour within the profession is significant and has this had any impact on your career

How do you perceive power relationships on site and in the office

Are you made to feel different in any way within the wider male-dominated culture of civil engineering

5) BUSINESS EXPECTATIONS

Have you experienced any restrictions on where you can work, particularly in respect of overseas projects

Do you enter into contract negotiation

6) GENERAL

How do you think working practices and expectations could be changed to improve the profession generally

What in particular would improve your experience at work

Prior to the interview do you feel that you were given enough information about the study.

What do you think of the questions included in this study.

How did you feel about being interviewed.

Are there any issues of concern that have not been raised; is there anything that you would like to ask me.

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