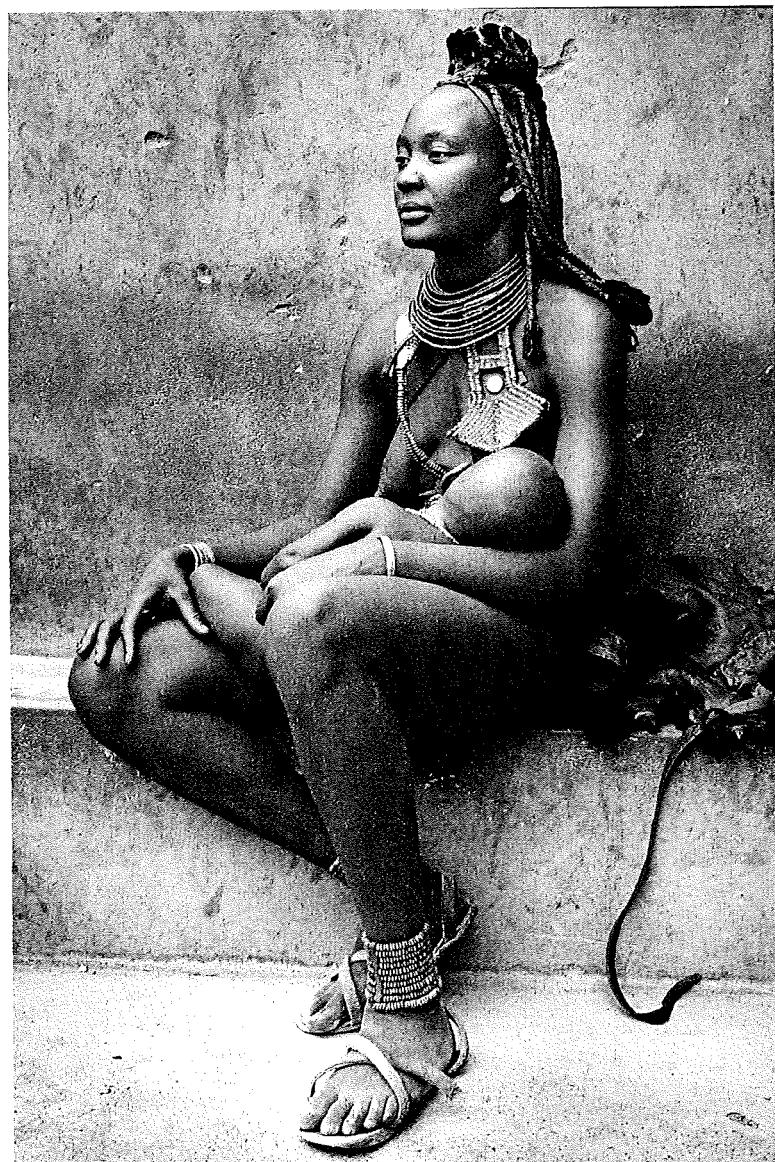


**The research, design and concept development of a new chair to meet the
needs of breastfeeding women and their infants**

A thesis submitted for the degree of Doctor of Philosophy
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Cover Illustration: **Himba Woman, Namibia.**¹



Breastfeeding could be regarded as a form of bodily intelligence, which might in turn have corporeal ramifications: spines might straighten, shoulders may drop, necks may lengthen and heads be held high if breastfeeding were practised with pride in all its manifestations: visibly active, highly changeable, and overwhelmingly wet.²

¹ Illustration from Kitzinger, S, *Rediscovering Birth*, Little, Brown & Co., p.13 , 2000

² Women's Studies International Forum, *Breastfeeding As Headwork*, Elsevier Science Ltd., Vol. 25, No.3, p.373, 2002

Abstract

It has long been recognised that breastfeeding rates in the UK are substantially below an optimal level to promote the health of mothers and infants. While there are many variables which affect a mother's decision to breastfeed a significant factor in the discontinuation of breastfeeding is infant distress, maternal distress and maternal pain and discomfort brought about through poor positioning. Poor positioning is often the result of the wholly unsuitable type of furniture that mothers use to aid breastfeeding whether making use of furniture supplied in hospitals, GP waiting areas and clinics, or making use of the domestic furniture to be found in the family home. However, despite this it remains true that to date, despite a perceived need to design a breastfeeding chair, there has been no published research which has tested furniture designed to assist breastfeeding and there is no furniture currently in production which supports the needs of breastfeeding women. It has been the purpose of this thesis to specifically examine and address these observations and to explore the feasibility of a breastfeeding chair suited to the needs of breastfeeding women. In order to do this the thesis reviews furniture which has been improvised and appropriated for breastfeeding and through a series of case studies, analyses examples of breastfeeding posture in order to generate relevant and unique ergonomic data. Through further allied research, related cultural and medical issues are also identified and discussed in order that an appropriate design brief for a breastfeeding chair might be defined and its specification detailed. Finally, in order to explicate the design process, the thesis traces the development of the chair through prototyping and into its eventual commercial production. The thesis concludes with a critique of that process and recommendations for further research.

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Preface

I would be lecturing students and feeling my milk coming through my T-shirt. On one occasion, a student during a tutorial, turning red with embarrassment, pointed out the large circles of milk rapidly forming on the front of my top. I ran to the nearest loo and cried. **I often found myself in search of somewhere nice and quiet to use my pump or to feed my son.**

Anonymous, interview with author, 2001

There are histories of breastfeeding, wet-nurses, etc. but I can't think of one that discusses the furniture...

Germaine Greer, letter to author, 21st June 2000

A new mother's account...

Following the birth of my first child, I was told I was 'doing fine' and would be discharged just as soon as my daughter's temperature was down to normal.

A nightmare followed seemingly generated by the feeding and sleeping cycle, or in my case, the not feeding, not sleeping cycle.

It was several days before my health visitor told me that my daughter was not gaining weight and for this reason I should try expressing more milk, or introduce formula. I was distraught. I had failed to achieve my greatest objective of my famously named 'Birth Plan'. It was awful. I felt exhausted and both mentally and physically very weak. Every attempt at expressing was painful and unsatisfying, seeing half an ounce on a good day, sitting in the bottom of a bottle was disheartening. Pumps were brought to my home with great excitement. None of them worked. Incidentally and much more relevantly, none were demonstrated. Blood out of a stone springs to mind...

By this time, my nipples had cracked and were bleeding. My midwife had advised me to use nipple shields to protect them. These look like small Mexican hats made of soft latex rubber, a material reminiscent of the contraceptive devices I had come to know so well in the past. How I wished I had remained friends with them now! I was also introduced to breast milk cups: small dome shaped plastic cups fitting neatly over the nipple not being used, which would collect milk leaking from that nipple. They slip around and only really stay in place inside a bra cup, which would not be worn during the night when you are waking every two hours to feed anyhow.

The greatest design problem with all these devices is that of germ collection, in my case collecting far more rapidly than any milk. Consequently, there followed a serious attack of mastitis. This feels like a furnace under the skin of the breast. It is excruciatingly painful. 'Milking off' is advised to ease the problem. So you put your child to this enflamed breast and sob as she sucks you to death. Yet still you continue. You won't give in. You feel feverish, shivery and very ill.

A friend then told me to contact the Infant Feeding Centre in The Women's Centre at The John Radcliffe Hospital in Oxford, about twelve miles drive from my home. They advised me that it is poor feeding technique, rather than repeated infection that causes recurrence, yet every 'specialist' who saw me feed at home said my daughter was "well latched on". I returned to the centre, who again observed her to be poorly latching on...

Remember also the timing of these events. Often 'sutures' or stitches, in the perineum, prevent comfortable sitting for the initial weeks after birth.

Feeling uncomfortable is the general picture.

Things begin to return to normal, you are still tired, you are still drained. Then the old bombshell is dropped on you again from a greater height: your baby is losing weight and you are told that "you must get some milk into that baby!" Feeding at 45 minute intervals at this stage, again I despaired.

I was regularly visiting The Infant Feeding Centre by now, although I was never once referred there, or even told of its' existence by my health visitor.

All was fine whilst there. I felt empowered. But on my return home I could never have the same success. We were told that our daughter's weight was now dangerously low.

My partner that evening rushed out to buy the dreaded formula milk, bottles and sterilising fluid and I watched, sobbing yet again, as our little daughter appeared to snatch the bottle from his hand and milk it dry. I felt that my breasts, though swollen and very sore, were useless. I was useless.

Soon after, a health visitor told me that it was all right to combine breastfeeding with bottle-feeding and so I went on to feed our daughter that way for several months. Combining feeding methods was a revelation to me.

During this time other discomforts I had suffered all along came to the fore: backache; headaches, due to general discomfort and lack of fluids; warmth, especially when feeding during the long winter nights; poor posture... I had been advised to get up out of bed to feed and to go downstairs, as my baby on more than one occasion had suffered near suffocation when I awoke hours after sitting up in bed to feed her, to find her seemingly choking on my breast. Sitting downstairs on a very inclined sofa offered other dangers; my baby fell off my knee when I fell asleep again. There seemed a never-ending spiral of problems.

Finding a comfortable posture was the most difficult of these, and perhaps, not getting this right early on, proliferated other problems...³

*Mother interviewed by the author, The Infant Feeding Centre,
The John Radcliffe Hospital, Oxford, 1998*

For some four years now I have been looking for ways to make the activity of breastfeeding more comfortable, enjoyable, sexy and ultimately more successful.

I have done it for everyone who finds that they are part of the world of the woman who breastfeeds, to offer the possibility of accessing furniture that helps support them through an often very difficult time. But really there should be no need for this project. Breastfeeding in public should be commonplace. Breastfeeding in the home should be delightful and breastfeeding in hospital should be imperative. This is my story of how the medium of furniture can effect change in the lives of people who breastfeed.

When I had my own child four years ago, I lived through the research in a way that I now realise helped to shape it. **There is nothing like breastfeeding in comfort.** I hope you will gain an insight into the world of the breastfeeding mother: it is a place in which we should all feel at home. Furniture must support us, making life more manageable and more pleasurable: pleasure is a function not a bonus and an essential criteria for good design.

Question: Can design be used for the creation of works reserved solely for pleasure?

Answer: Who would say pleasure is not useful?

Charles Eames, film: Design Q&A, 1972

Therefore this work is a celebration of serenity, sensuality, function **and pleasure**, all elements of the design criteria specified in the design brief that evolved naturally out of this piece of research.

Acknowledgements

Primary research about infant feeding was much more difficult than I expected – any research to do with the body I very quickly found requires a sympathetic and sensitive ear. The following inspired me to have that kind of ear and to have the patience to complete this work:

Thanks to all of the women who answered my appeal for case studies. They are:

Carly

Christine

Julie

Susan

Hattie

Janet

I would also like to thank:

Professor Sally Kendall (supervisor)

Dr. Reg Winfield (supervisor)

Peter Cornish, Des. RCA, BCUC

Chloe Fisher, The John Radcliffe Hospital, Oxford

Sally Inch, The John Radcliffe Hospital, Oxford

Sheila Kitzinger

CPHVA – The Community Practitioners and Health Visitor's Association, London

Dr. Claudia Kinmonth, BCUC

Ray Batchelor, BCUC

Chris Cattle, Des. RCA

David Creighton, BCUC

Kelly Dumville MA

Richard Levene (for covering my sabbatical)

Ian Barker (for allowing my sabbatical)

Robin Day for his letters and support

Anne Greer, The Royal Gloucestershire Hospital

Alison Ramsay, Stepping Hill Hospital, Stockport

Richard Hughes at Tract in Thame

And my family for their constant support:

Jonathan Solly

Jane and David Solly, particularly in times of urgent childcare need.

Hilary Solly

Iris Harbour, also for childcare at short notice.

Doreen Jones

....and Elinor Solly, who at still only 4 years old understands breastfeeding like no other child of her age

For Elinor.

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Introduction

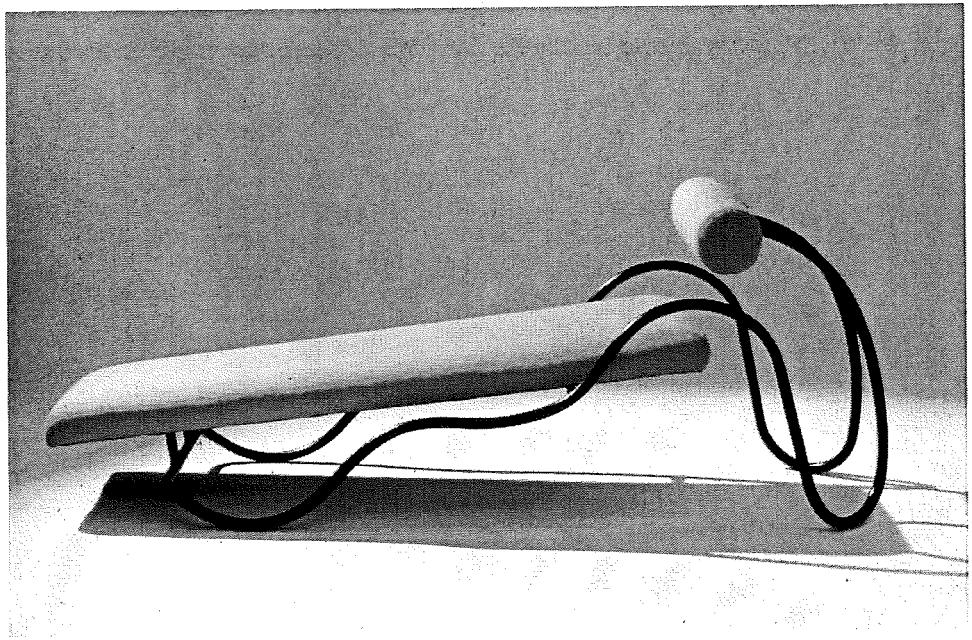
The purpose of this study has been to establish the need for a breastfeeding chair and then to design a chair to respond to that need.

In 1995 the *Community Practitioner's and Health Visitor's Association* (CPHVA, formally HVA) established a partnership with *The Royal College of Midwives* to form a strategic alliance known as *Invest In Breast Together*. The aim of the partnership was to promote communication about breastfeeding between the two professional organisations and to develop ways of training professionals in working together to promote breastfeeding. This was established in the light of the UK statistics, which, at that time indicated disappointingly low breastfeeding rates. The *Invest In Breast Together* partnership commissioned Sally Kendall to develop and write a training programme for health visitors and midwives. This was funded by *The Department of Health* and was first published in 1995, followed by a second updated edition in 1997. It was after the launch of the second edition that the partnership, in consideration of other strategies for promoting breastfeeding, asked Sally Kendall to approach a furniture designer from *Buckinghamshire Chilterns University College* (BCUC) about the potential for a new chair for breastfeeding women. Having designed furniture for women previously (Fig 1), I responded. This dissertation marks that response. Subsequent discussion with *The Invest in Breast Together* partnership led to the formulation of four key questions:

Research Questions:

- **What is the perceived need among women themselves for a chair to support breastfeeding?**
- **What is the current availability of such furniture in areas where women might be expected to breastfeed both in public areas and in the home?**
- **What is the perceived need for such a chair among professionals and other experts in the field?**
- **What ergonomic data is required for the design of a breastfeeding chair?**

This thesis will argue that the availability of a chair which enables easy and correct positioning would minimise the problems and maximise the opportunity for breastfeeding to be sustained for at least the Government's recommended four month post-birth period. The benefits of such a chair are manifold. It would be cost effective in saving practitioner time with maternal worries and reduce prescription costs for damaged nipples and surrounding skin. Moreover, long-term benefits could be gained by reducing hospital admissions for gastro-enteritis and in later life reducing the possibility of obesity and maternal cancers. Chairs currently seen being used in hospitals and breastfeeding clinics are adapted versions of chairs designed for other uses where the materials used for upholstery, often vinyl, are insensitive to the needs of mother and baby. Frustrated midwives have taken a saw to the legs of such chairs in an effort to give them a lower seat height. In the home, heavily upholstered modern three piece suites are not designed to support breastfeeding women in the appropriate position when sitting upright, most being too soft, low



1. Bench Designed for Women, by Lynn Jones, 1986.

Gentle exercise can help women through different times in their lives. From the relief of period pain to the strengthening of muscles before and after childbirth, furniture can improve the health of women. This bench was designed to relieve dysmenorrhoea, otherwise known as period cramps. Some self-help books recommend that women prop an ironing board against the front edge of a dining chair and lie on it to achieve the same effect.

backed and disabling in bringing the infant to the breast. Appropriately, sensitively and creatively designed furniture could bring with it the empowerment many women need to maintain the activity of breastfeeding.

The principal aims of this project have been:

- **To conduct and complete the research, design and development of a chair to meet the needs of breastfeeding women.**
- **To test mock-ups and prototypes with groups of women in terms of aesthetics, comfort, facility to breastfeed and satisfaction with feeding from the chair.**
- **To write and present supporting text of an historic, cultural and design nature intended to contextualise the chair.**
- **To present the research and the chair at the CPHVA (*Health Visitor's Association*) National Annual Conference 2002.**
- **To find an interested manufacturer for the chair.**

Overview

This thesis is divided into two sections:

- i. **Section A: Breasts and Breastfeeding: A Cultural and Medical Context**
- ii. **Section B: A Chair For Breastfeeding Mothers: Design Research and Development**

Chapters 1 and 2 form the first section; chapters 3 and 4 form the second section. The following overview aims to summarise the content of all of the chapters.

Section A: Breasts and Breastfeeding: A Cultural and Medical Context

Chapter 1 Breasts and Breastfeeding

The first chapter offers a historical and political context of breasts and breastfeeding prior to the design debate, setting the scene and proposing the justification for a specifically designed breastfeeding chair. Various statistics for breastfeeding are introduced with particular emphasis on those most recently collated in the UK in the *2000 British Medical Research Board (BMRB) Infant Feeding Survey*⁴. Political and global issues are introduced which together with sociological and historical considerations of the breast and breastfeeding, prepare the reader for a new way of thinking about chairs for women who breastfeed.

⁴ Hamlyn, B, Brooker, S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, (2002) London, TSO
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By looking at a broad spectrum of contemporary views, from breastfeeding women to specialists in the field of breastfeeding and its promotion, from the views of designers to those of the public, the case for this undervalued and therefore as yet unavailable product, a breastfeeding chair, is made.

This chapter also discusses reasons why breastfeeding remains an unpopular choice for women and proposes the idea that design and designers are in a position to influence that choice by designing environments, furniture and products not only to satisfy functional requirements or personal decorative taste but to be actively enjoyed.

Breastfeeding represented in the media is investigated by appraising the vast difference of approach depending on target markets and by highlighting the contradictory values demonstrated across a wide cross section of women's magazines. For example, the values expressed in *Elle*, *Vogue* and *Cosmopolitan* are compared to *Parenting* and *Mother & Baby* illustrating how the two market groups targeted are significantly different and revealing how this relates to available product choice together with women's perceptions of themselves as mothers.

Chapter 2 Psychology, Anatomy and Physiology

This chapter introduces the physiological and psychological influences on choices to continue breastfeeding and how ambience and spatial factors affect those influences. The merits of breastfeeding are summarised along with the merits of breast milk itself. Published sources and first hand interviews with health visitors, midwives and breastfeeding women are studied. Hence the conclusions drawn in this chapter indicate fundamental considerations for designers, considerations they might normally overlook; the relevance of positioning, relaxation and comfort to 'latching-on'. The subtleties of seated position in relation to the physiology of breastfeeding (which often confuse women about correct breastfeeding posture) are also discussed more explicitly in this chapter along with the psychological effect breast cancer has on breastfeeding.

The chapter includes selected images from painting, photography, sculpture and ancient ceramics. These tell us an enormous amount about how much was understood about breastfeeding posture. Where furniture is clearly illustrated, its origins are analysed, and its appropriateness for the Twenty-First Century speculated on. *The Royal Academy* archives, amongst others, provide critical clues to breastfeeding habits, posture and culture, which can be then usefully compared to behaviour today.

Section B: Design Research and Development

Chapter 3 Design Research

Case studies, site visits and interviews with specialists in the field of breastfeeding form the opening section of the chapter, and the evidence provided from them is considered in preparation

for the writing of the design brief. It is quite possible that never before have women breastfeeding been observed, measured, drawn, photographed and filmed in relation to their furniture as they have been for this study. For this reason I have chosen to include as much of the photographic material gathered as possible, which makes this section of Chapter 3 particularly 'picture rich'. Chairs that are identified in homes and clinics are discussed and compared to other examples of historical and contemporary chairs. This chapter also discusses earlier examples of Nineteenth and Twentieth Century so called *nursing chairs* and their inadequacies in order to discuss their variation and describe their role and their function.

Design for women is summarised as being limited but improving. Design for breastfeeding women remains virtually non-existent save for the design of the breast pump (Fig 2). By showing how design can influence and improve the lives of women in the West, this chapter also demonstrates how effective design, targeted at essential women's products, can be. Issues of comfort including a reflection on upholstery from the Eighteenth Century onwards set the context for a debate about the advantages and disadvantages of developing a new upholstery fabric for the breastfeeding chair. Breastfeeding in public is a contentious issue in the UK and is raised in this chapter to illustrate examples of the context within which the design of the chair will sit.

Chapter 4 Design Development

The design brief and the background to it form the central focus for the thesis, where having collected all the evidence the design development begins. Ergonomics and anthropometrics are defined and the six case studies introduced in the previous chapter are measured and data analysed. It is collated from primary sources using a variety of methods resulting in a series of ergonomic decisions. These are further applied to the prototypes to be evaluated later in this chapter. Issues of comfort and style are addressed using a selection of twentieth century task chairs. Ideas about the specification of materials and production methods are introduced in the light of the collected evidence (Chapter 3).

This chapter introduces the design process proper with sketch and prototype development forming a large proportion of the study. A test-rig, designed and built during the primary research stage is evaluated, the results of which are analysed and applied to the mock-ups and prototypes that follow.

A design methodology is evolved beginning with the first early sketches, test-rigs and cardboard models of the breastfeeding chair and developing through to those made in collaboration with *Tract* (a manufacturer of mass produced contract office seating in Thame) and *Dawson's Fabrics* (a manufacturer of fashion fabrics in Huddersfield).

Design proposals are presented and justified in this chapter. Using full sized prototypes and associated drawings, the chair design will be described and its features discussed.

A debate about methods of production and why some methods were chosen in favour of others brings the chapter to a close.



Nationwide Egnell Electric Breast Pump Hire

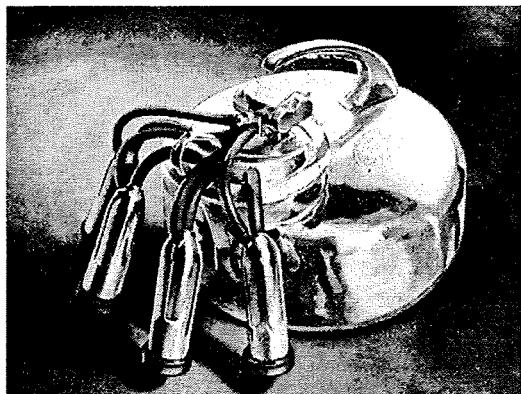
Working in Association with the
NCT, LLL & ABM



For details of local or direct breast pump hire contact:
EGNELL AMEDA LIMITED

01823 336362

Egnell Ameda Ltd, Unit 2, Belvedere Trading Estate, Taunton, Somerset TA1 1BH.
Fax: (01823) 336364
email - hire@egnell-ameda.co.uk



2. The design of 'user friendly' products for breastfeeding women remains virtually non-existent. These breast pumps are from the range currently on the market. Ironically, the pump for milking cows (bottom right) appears to be more portable and less intimidating than the other two.

Thesis Conclusion and Future Developments

The conclusion aims to pull together all the strands of the research in order to illustrate how a multi-disciplinary research study has successfully led to the design of the breastfeeding chair. The scenario for a breastfeeding chair is reflected upon. Breastfeeding mothers test the chair and offer their feedback.

This is an end commentary, a critical review by the author of the chair and of the research work undertaken. It includes the author's final appraisal of the chair. A proposal is made for the further testing of prototypes to establish whether the chair could influence breastfeeding rates in the UK. Future developments are proposed at the end of this chapter, following a general conclusion of the project

Conclusion to Overview

A number of discursive strands are investigated. The history of breastfeeding is a field fraught with controversies: political; social and cultural. The history of nursing chairs provides another useful yet controversial context with the issue of wet nursing bringing the function and role of early nursing chairs into question. Women's studies, medical contexts for breastfeeding, feminism and the history and biology of breasts all influence the rationale for the breastfeeding chair. Having established this rationale, prescribing a design methodology for the design of a breastfeeding chair is difficult: each designer will approach the design of a product differently. As seen in the comparison with James Dyson's design philosophy most designers are directors of the design of their product and find it extremely difficult to articulate their own design methodology.

A design brief *may* indicate several intentions or desirables: aesthetics, ergonomics, technical requirements, budgets, environmental factors, production methods, material specification, timescale (a deadline), target markets, marketing, but in the end, designing and 'how to do it' is not easily definable:

....you never really know how you do it, you just do it. It's like asking a horse how it walks. I thought perhaps if I try to explain everything we do that other companies probably do not do, then people might be able to work out the philosophy themselves.⁵

The aim of the latter chapters is therefore **to communicate the author's design process** from the beginning of the collation of the research to the appraisal **of the breastfeeding chair** at the end of the thesis.

⁵ Dyson, J, *Against the Odds*, Orion Business, (1997), p. 197

Methodology: Overview

*(Research Methodology is detailed in Chapter 3, 3.1)
(Design Methodology is detailed in Chapter 4, 4.2)*

Traditionally methodologies for designing objects, particularly chairs are difficult to define. Recommending them is equally difficult. Design is notorious for ‘being different’ but I suspect it is no more difficult to define than any other discipline. Divine inspiration, problem solving and ‘eureka!’ moments have all played their parts in the history of furniture design. As James Dyson says of designing things, ‘you never really know how you do it, you just do it.’⁶

The discipline of furniture design is a relatively new one. Although furniture has always been designed it has been happily sitting in the realm of cabinet and chair making for centuries. Who was the first furniture designer and what was her or his design methodology? Everyone’s methodology is different. Much of good design has to do with being considerate, examining other examples in the field and observing their good and bad qualities. Having the motivation to resolve conflicting requirements and the discipline to organise methods into a logical sequence, whereby one method feeds the next, helps to define a process, a way of designing.

Examining other examples in the field in this instance has been difficult. It became clear early on in the research stage that breastfeeding chairs did not exist, or at least if they did they were going to be hard to find. For this reason methods were chosen that would enable knowledge to be gained about the activity of breastfeeding. This in itself proved to be difficult. It is almost as difficult to find someone breastfeeding as it is to find a breastfeeding chair. Then when you find them, what do you do? Ethically you are immediately faced with a dilemma: will this woman be embarrassed? Will she be angry? Am I invading her privacy simply by asking to *talk* to her about breastfeeding? Similarly clinics and hospitals have strict rules prohibiting photography, which can hinder progress and stifle design development.

The methods used therefore were carefully chosen to minimise ethical difficulties and to maximise the potential for practical furniture design research. Women approached to act as case studies were all either known to me already, or recommended to me by a specialist in the field of breastfeeding or by a friend or relative (3.2).

Socially and politically I was faced with other dilemmas. On one occasion, whilst discussing the issue of women returning to work and needing to express milk in comfort I was verbally attacked by an outraged woman who told me in no uncertain terms that women should be at home with their babies. On another occasion I was advised that designing a chair for breastfeeding was a ridiculous idea – what is wrong with bottle-feeding? This kind of reaction inspired thorough research into the historical, social, cultural and political context of breastfeeding. It is imperative to

⁶ Ibid

understand the complex series of events historically that have defined where we are today, to the social taboo that I believe breastfeeding still is.

Academically working on a daily basis with postgraduate research students helped me to question the design process. Academic texts from the nursing profession and ongoing discussions with specialists in the field of breastfeeding and midwifery inspired much of the research. For example, the idea of taking samples of people, using field notes and employing different interview techniques came from this discipline. In design terms, I was fortunate in being able to call upon the resources of BCUC, (*Buckinghamshire Chilterns University College*) an institution filled with furniture expertise, art and design researchers and academic experience.

Commercially, having worked in the office furniture industry as a company furniture designer before entering the teaching profession, I felt confident that the structures of this kind of industry would support the production of a breastfeeding chair, the difficulty was, would I convince them of it's economic viability? I did not want this research to sit on a shelf, I wanted it to be a commercial reality, out in the field, improving the quality of life.

The choice of texts relating to breastfeeding was influenced by many of the specialists in the field who I met over the duration of the project, whereas many of the design texts were already familiar to me. For example, Chloe Fisher recommended *Successful Breastfeeding* as a good basic guide to physiology and positioning at the breast; Sheila Kitzinger (3.3.6) provided me with texts of a social anthropological nature and recommended *Rediscovering Birth* and *Birth Traditions and Modern Pregnancy Care* to provide initial contextual information about breastfeeding, and Professor Sally Kendall provided me with access to various research articles from health journals which introduced me to breastfeeding rates in the UK and the research of others on issues affecting those rates.

Gabrielle Palmer's *Politics of Breastfeeding* and Vanessa Maher's *The Anthropology of Breastfeeding*, also recommended by Kendall, were particularly useful. Palmer's book gives an accessible account of the more political aspects of breastfeeding and bottle-feeding and explores the social pressures exerted on women globally to feed their babies artificially. It is a cross- cultural study of breastfeeding which inspires the reader to understand the commercial, economic and political pressures on women and their choice to feed their baby in a particular way. Maher's book is an anthropological collection of essays, which examine cultural norms and breastfeeding practices in selected countries, emphasising that the significance of breastfeeding reaches far beyond its biological function. Marilyn Yalom's *A History of The Breast*, bridges the gap between breastfeeding as a health issue and breastfeeding as an arts issue by giving an eclectic cultural history of the breast across time. Texts on feminist attitudes were suggested by Germaine Greer, herself a key writer in this area, and by other women encountered during the research. These texts celebrate being female and offer serious insights into how feminism affects daily life and ultimately of how design in it's social context is a part of that scenario.

Research assistants and archivists at *The Design Council* archives at *The University of Brighton*; at MODA (*The Museum of Domestic Architecture*) at the *University of Middlesex*; at the V&A and staff at *The Wellcome Trust* in London all provided archival material in the form of journals, catalogues and design publications referred to in Chapter 3.

Vitra were also very helpful and provided me with the opportunity of meeting Charles Eames' grandson, Eames Demetrios, at his book launch *An Eames Primer*, along with access to their own *Vitra* publications.

The feminist position on design is supported by the collection of essays edited by Attfield and Kirkham *A View From The Interior* and Penny Sparke's highly acclaimed gender and design debate *As Long As It's Pink*; and Catriona Clear's *Women of The House*. Clear's account provides a particularly useful appraisal of the ways in which working class women in Ireland during the late 1800's and early 1900's arranged their domestic spaces (Breastfeeding and wet-nursing is referred to throughout this text).

There is a lack of texts specifically addressing female ergonomic issues, the only one found being Croney's *Anthropometry* which contains rare observations of women's sizes: although relative to the design of office seating, this is a useful comparative study. Galen Crantz's *The Chair* highlights a wide range of issues related to the design and role of chairs in society: social; ergonomic; and cultural, and is an imperative read for anyone about to embark on the design of a chair. Her critical appraisal of some of the 'design classics' provides compelling critique of some of their inadequacies in design terms, in addition to their virtues.

50's Decorative Art by Peter and Charlotte Fiell catalogues one of the most comprehensive photographic records of relatively uncelebrated 1950's chairs available and *An Eames Primer*, mentioned earlier, is the most explicit personal biography of the lives and work of Charles and Ray Eames you could ever hope to come across.

Robin Day provided information about his 1960's shell chairs referred to in Chapter 3 and James Dyson's autobiography, *Against The Odds* provided a useful comparative design methodology, discussed in Chapter 4.

With regard specifically to contemporary chair production, Richard Hughes, the managing director of *Tract* in Thame gave me valuable advice about the production process of the breastfeeding chair, as did two key members of his workforce: Pete Freeman (metal workshop) and Kevin Davies of *Upholstery Trading*, a subsidiary of *Tract* in High Wycombe. Kevin is a particularly skilled and experienced upholsterer in the commercial sector and made a considerable contribution at the final prototyping stages of the project. Other producers of furniture such as Jonathan Solly at *And Furniture* and many of the visiting professional designers who lecture at BCUC offered comprehensive advice on relevant aspects of furniture production.

Freelance furniture designer Roger Webb of *Roger Webb Design* advised on the prototyping of the first full size *Styrofoam* model of the breastfeeding chair, as did Dick Powell of *Seymour Powell* design consultancy. The late furniture designer Fred Scott also gave invaluable advice during the early stages of the design development and a visit to his studio reinforced much of my early thinking about the design of chairs for tasks. Specialist design expertise at *Buckinghamshire Chilterns University College* was critical to those chapters of *Section B: Design Context*, under the direction and advice of Dr. Reg Winfield, joint supervisor for the thesis.

A complete account of sources can be found at the end of this document.

Section A: Breasts and Breastfeeding : A Cultural and Medical Context

Introduction to Section A

Section A comprises of Chapters 1 and 2:

- Chapter 1: Breasts and Breastfeeding
- Chapter 2: Psychology, Anatomy and Physiology

Chapter 1 introduces the reader to the subject of breasts and breastfeeding in order to provide the context for the breastfeeding chair. It is only relatively recently that there has been more than one way to feed a baby: breastfeeding was the only option prior to the Industrial Revolution and still is in some cultures. Although the statistics for maintaining breastfeeding are low in the UK (the lowest being recorded in Northern Ireland¹) most mothers are aware of the fact that it is the healthiest way to feed a baby. The reasons for not choosing to breastfeed are manifold and formula feeding, where artificial powdered milk substitutes are given to babies in a bottle, is a new phenomenon that only widely became available during the Twentieth Century. Chapter 2 focuses on the psychological considerations relevant to the design process and puts forward ways in which a mother's mental state can have an effect on her ability to breastfeed. Physiological aspects of breastfeeding are also discussed in order to prepare the reader for how this information impacts on the anatomical issues at the end of the chapter. In summary, the evolution of breasts and breastfeeding needs to be comprehensively understood in the first instance in order to acknowledge the need for a breastfeeding chair. This section aims to discuss these issues in order to provide inspiration for the design of the breastfeeding chair that is described, designed and produced in Section B.

1. Breasts and Breastfeeding

Introduction

Perceptions of breasts by women and by men have influenced society's feelings about breastfeeding as have diverse political agendas. It is also not only mothers who breastfeed: wet-nurses, mothers who earn money by breastfeeding the offspring of other mothers, for example, may have affected the design and perhaps more interestingly the role of the 'nursing chair' during the Victorian era. In other cultures where chairs are not dominant or used very much at all, the seated posture of women breastfeeding, even when sitting on the floor or against a wall, can indicate some fundamental ergonomic requirements for the mother who breastfeeds in the chair dominated society we have in the West. Firstly, what are breasts and how do our perceptions of breasts influence our perceptions of breastfeeding?

¹ Hamlyn, B, Brooker, S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, (2002), TSO

1.1 Breasts

All mammals have nipples but only human females have breasts. The breasts of apes swell only when they lactate, the change in size being hardly noticeable beneath their body hair. Once the female has weaned her offspring, her breasts flatten back. Natalie Angier in her anthropological text, *Woman* is convinced that human breasts are accidental ‘accoutrements’:

They are accoutrements, sensory exploiters, they say little or nothing about a woman’s inherent health, quality or fecundity....Only in humans do the breasts inflate at puberty, before the first pregnancy occurs or could even be sustained, and only in humans do they remain engorged throughout life....For all women maternal augmentation results from the proliferation and distension of the cells of the ducts and nodules (the dairy equipment), increased blood flow, water retention, and the milk itself.²

Many people want a big car, penis, or house despite there being no practical advantage, so as small breasted women have the same amount of lactogenic tissue as do large breasted women, and can therefore make as much milk, what is the requirement, functional or otherwise, of large breasts? In Fig 3, John Currin exaggerates this scenario in his cartoon-like painting of the stereotyped experience of women and their relationship with, and the viewer’s relationship with, their large breasts. Meanwhile, Angier continues:

On the contrary, the aesthetic breast is non-functional to the point of being counter-functional, which is why it strikes us as so beautiful...We understand the worthiness of the practical, but we rarely find it beautiful. The large non-lactating female breast has so much intrinsic irrational appeal that it almost sabotages itself.³

Evolution could perhaps provide more clues as to whether they are just redundant bodyparts, left over from an earlier age, or whether they are as Robin Baker (below) believes, still serving a very useful physical function aided by their form.

1.1.1 The Evolution of The Breast

Biologist Robin Baker has a theory about breasts which provides a perfect metaphor for much of the rationale of the form of the breastfeeding chair. Rather than being, as Angier states, accidental accoutrements, on the contrary, breast form serves an ergonomic function, a physical function, which is explicitly related to the task of breastfeeding.

It is because natural selection made breastfeeding an ongoing and spontaneous procedure - ‘milk to go’- that it simultaneously gave women their characteristic waist, hips and breasts. Whereas the babies of other primates can cling to their mother’s body hair as they

2 Angier, N, *Woman*, Virago , (1999), p.125

3 Angier, N, *Woman*, Virago , (1999), p.126



3. Jaunty and Maine, by John Currin, 1997.

This painting features a spectacular meeting of busts. The painting is a cartoon of the stereotyped experience of women and their relationship, and the viewer's relationship to their breasts, but what is the function of large breasts?



travel, human babies and infants tend to perch on their mother's hip, supported by a restraining arm. Hips are perches. This is why the ideal female shape, as mentioned, gives a waist considerably smaller than the hips and why males have been programmed to find such a shape attractive....Breasts are cushions, not glands. The padding that gives them their characteristic shape has nothing to do with milk production...⁴

His theory makes sense. Watch a mother carry her infant and you will notice the child's head snuggling into the breast and it's legs wrapped around her waist (Fig 4). Better still watch a child being carried by its mother sleeping, particularly after a feed. Although one could argue that the child positions itself similarly in a man's arms, the shape of a man's torso does not usually have the same amount of cushioning i.e., breasts and hips, as a woman's (Fig 5). Baker also highlights further relevant points of an evolutionary nature, arguing that women were not designed to breastfeed in the way that they do now: sitting in a fixed position, partly undressed, in a usually difficult to find, socially and spatially suitable place (Fig 6).

Primates, and women in particular were not designed to breastfeed in this way...Breastfeeding evolved to interfere as little as possible with the female's activities. Whether monkey, ape or human, whether walking, sitting or even sleeping, she was designed to carry the baby with its head near her nipple so that food was just a root away at any time of day. However, even if modern women could walk around naked (at least from the waist up) while breastfeeding, many would have neither the strength nor stamina to travel far while doing so.⁵

Rather than strength or stamina, it would be socially unacceptable and probably cold. In the UK she would almost certainly be arrested.

Breasts evolved to be exposed to the elements (Fig 7). In African countries where nipples and the skin around them are tough, hardened by a lifetime of exposure to sun, rain and wind, sore, cracked bleeding nipples were never encountered by the sociologist and midwife J.V.Priya. During her research visits to the African and Indian continents for example, all mothers breastfed their infants with little or no difficulty:

In all the places I visited I came across no one who had been unable to breastfeed....I came across very few people for whom cracked nipples were a problem and only one group, the Karen, had a cure for it, consisting of the fat found under the shell of a land crab which had to be caught in the rice padi.⁶

Baker usefully likens the nipple skin to that on the feet. We know that wearing socks and shoes and always protecting them from the elements stops them from hardening, so when we do eventually expose them and dare to walk barefoot all day long, they will crack bleed and become infected.

⁴ Baker, R & E Oram, *Baby Wars*, Fourth Estate Ltd, (1998), p.100

⁵ Baker, R & E Oram, *Baby Wars* Fourth Estate Ltd, (1998), p.101

⁶ Priya, JV, *Birth Traditions & Modern Pregnancy Care*, Element Books Ltd, (1992), p.116



4. Physical changes in a woman's shape evolved to suit her carrying and feeding her young, according to the biologist Robin Baker.



5. The breast as a cushion.

6. Baker argues that women were not designed to breastfeed in this way, appearing partially dressed in a difficult to find, spatially and socially unsuitable place.





7. **Breasts evolved to be exposed to the elements, toughening the nipples and the skin around them. The incidence of cracked and bleeding nipples is extremely rare in parts of the world where breasts are left exposed.**

Similarly, he adds, wrapping breasts in clothes and encouraging them to sweat for their lifetime makes them too fragile to withstand suckling, so that when they are required to do the job for which they are designed - 'to be sucked, nibbled and pulled about by the wet mouth of a baby - they aren't up to it'.⁷

Humans did not always walk vertically. Baker insists that this evolutionary change from walking on all fours forced physical changes in the woman to suit her carrying and feeding her young:

Women encountered a problem not often experienced by their pre-human ancestors: how to stop their babies head, which was particularly wobbly while the baby was asleep, from forever banging against their ribs. Part of evolution's scheme for bipedal walking, therefore will have been selection for a cushion for the babies head. And what better cushion than a swollen breast?⁸

The idea that the biological cushioning provided by the woman evolved in this way is returned to in Chapter 3 - Design Research, when one of the case study women in this thesis describes how she would like the chair to feel 'like her own mother holding her in her arms'. Psychologically, our memory of infancy is clearly influenced by how fundamentally it felt to be held by our own mother. The advent of the corset which pushed the breasts up to form an almost horizontal cushion where jewellery could be offered as if on a cushion of velvet interestingly reinforces the notion of the breast as a cushion. Perceptions of the breast are in a state of confusion.

1.1.2 Perceptions of Breasts

In the West whether male or female, we seem to be breast obsessed, until it comes to breastfeeding. Angier again provokes her reader to think about why the sight of breasts when breastfeeding should make us feel so uncomfortable:

We love the hemispheric breast for itself, independent of and often in spite of, its glandular role. We love it enough that we can be made squeamish by the sight of a breastfeeding woman. It is not the exposure of the breast in public that makes us uncomfortable....nor is it the reminder of our animal nature for we can eat many things in public and put pieces of food in a baby's mouth – or a bottle of breast milk for that matter – without eliciting a viewer's discomfort at the patent display of bodily need..it is the convergence of the aesthetic and the functional that disturbs and irritates us⁹.

The convergence of the aesthetic with the functional is an interesting concept that could be applied to other material objects. Like using a beautifully styled car just to do the shopping in or using Michelangelo's David as a hat stand, we are confused or even angered by this materialistic abuse of the form. Perhaps it is this materialistic view of breast shape which at first throws us into

⁷ Baker, R & E Oram, *Baby Wars* London, Fourth Estate Ltd, (1998), p.99

⁸ Ibid, p.102

⁹ Angier, N, *Woman* Virago, (1999), p.126

confusion followed by the later realisation that the maternal breast is soothing, inviting us to rest, and therefore admirable again? It may remind us too of the miraculous properties that we acknowledge breast milk to have.

For generations, breasts have been viewed as sexual ornaments, as functional body parts, and have been seen to act as political tools. In Africa, where women have always worn their breasts uncovered, the predominantly erotic meaning breasts have in the West does not exist.

In many villages, women sit in the sun with their breasts exposed, and older women will be out washing clothes with their breasts exposed , and it's all completely irrelevant to erotic arousal.¹⁰

In the West breasts and how they are viewed by both genders form a complex web of conflicting ideologies. On a daily basis women compete with images of pornography and commercial imagery used in advertising, in film and on television. Firm, youthful breasts and flat stomachs are the ultimate goal. Page 3 tabloid newspapers, with their obsessional daily parade of topless women mean that the biological aspects of being a woman form the basis for much of the evaluation of a woman's worth. Without suggesting that women are necessarily unhappy, with these ideals it is difficult to see how economic, emotional or physical security comes from conforming to such stereotypes.

Male admiration of the female form is itself conflicted. Male fears of women's bodies have been used to depict horror or even death throughout history. For example, recently in the *James Bond* film *The Living Daylights*, a man is killed by being crushed to death between a woman's breasts. This is a recurring male fantasy. Women interviewed for this study also expressed this fear, believing their baby could choke at the breast, and yet there is not a single case of a baby being suffocated by the breast. Most Western women still have their babies in hospital and many will have never seen a breast used to breastfeed. It is easy to see how women will be nervous and confused about their own breasts.

1.1.3 Sexual Stereotyping of the Breast

A woman will often value her breasts first and foremost as representative of her own sexuality. Much of how women behave is associated with how they look. The stereotypical female office worker, for example, whether working in the city or in the local travel agency will wear high-heeled shoes and a *Wonderbra* to enhance the protrusion of the breasts. Attracting a mate and keeping that mate is still deemed to be influenced by the shape of her body and the maintenance of her nubile beauty. Palmer reinforces this notion:

It is a fact of life that men do abandon women whose youthful bodies have changed and that abandoned women are poorer. The cosmetics and fashion industries thrive on women's felt need to maintain a certain prescribed ideal of physical attractiveness and they

¹⁰ Ibid, p.127

stimulate insecurities with the advertising images of impossible standards of beauty. Because stereotyped ideals of breast shape and size are endorsed by commerce and the use of 'soft porn' in the media to capture attention, many women are self conscious about their breasts even in private relationships and crave reassurance about their acceptability. Using breasts for feeding a baby may be emotionally confusing if society and your own experience has emphasised their sexual and aesthetic functions. Some women are shy of handling their own breasts. A new baby suckling with a powerful animal reflex can be disturbing to a woman who has never seen this happen and has not been prepared for it.¹¹

Our perceptions of breasts are invariably influenced by the perceptions, fantasies, and fears of others, often men, and have been throughout history. Anthropologically the picture is full of contradiction. Sexual stereotyping has evidently influenced many generations of women.

They may be de-emphasised for a short period as they were in the sixteenth century, when tiny breasts and thick waists were in vogue, and during the flapper era of the 1920's. But breasts always come back because we love them so much.¹²

Marilyn Yalom's introduction to her cultural study *The History of The Breast*,¹³ poses the question 'Who owns the breast?', bringing other people's perceptions in society into the broader context:

Does it belong to the suckling child, whose life is dependent on a mother's milk? Does it belong to the man or woman who fondles it? Does it belong to the artist representing the female form? Does it belong to the fashion arbiter? Does it belong to the clothing industry? Does it belong to religions asking for chastely covered breasts? Does it belong to the law, who can arrest topless women? Does it belong to the doctor who performs mammograms, biopsies and removals? Does it belong to the plastic surgeon who restructures it? Does it belong to the pornographer? or does it belong to the woman?

Her list suggests the varied efforts that institutions, men and women, and industries, have made to appropriate women's breasts in history. Artists and authors like Germaine Greer, Cindy Sherman, Freida Kahlo, Jo Spence and Annie Sprinkle amongst others have all experimented with or discussed representations of the breast during the Twentieth Century, as non-idealised, non-eroticised parts of the body, an idea that clearly has not yet found its way into the mass media, yet one that Yalom hints at, and artists devote lifetimes to explore (Fig 8). Media representations of breastfeeding and media representations of the breast are very much intertwined, with women and men confusing the issues concerning both. Babies see food. Men see sex. Increasingly, it is the threat of breast cancer that women see.

1.1.4 Breast Cancer and It's Influence on Breastfeeding

¹¹ Palmer, G, *The Politics of Breastfeeding*, Pandora, (1993), p. 49

¹² Angier, N, *Woman*, Virago, (1999), p.128

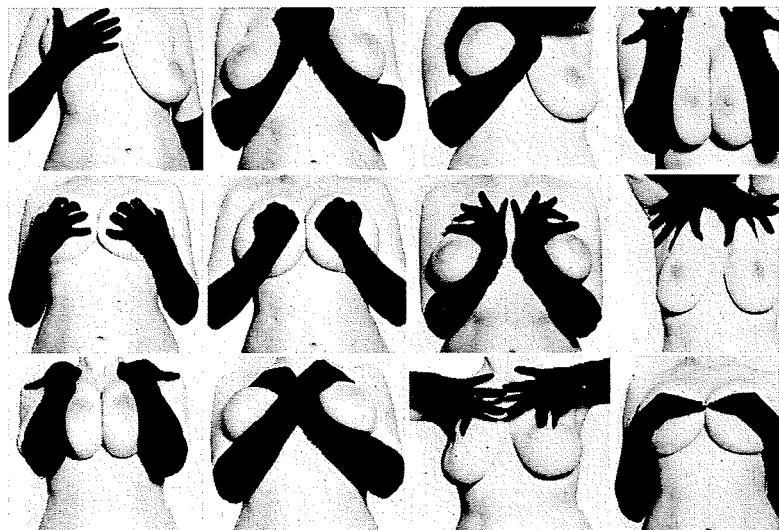
¹³ Yalom, M, *The History of The Breast*, Harper Collins, (1997), p.4

8.



95. Cindy Sherman. Untitled #225. 1990.

8. Untitled, 1990, by Cindy Sherman. Parodying the Renaissance paintings of the nursing Madonna, Sherman straps a prosthetic breast to her own body and poses her hand on it exuding a drop of milk: the breast is non-idealised and non-eroticised.



Bosom Ballet, by Annie Sprinkle. Although some might be shocked by Sprinkle's Bosom Ballet, the playful, non-violent appeal of her breasts does not seem pornographic.

One of the common comments I heard from women interviewed for this thesis was: "I think breastfeeding reduces my chance of getting breast cancer". Yalom confirms this:

But the breast as a timeless signifier of sex, life and nurturance now has to fight against its opposite meaning: the vessel of disease and death. In this respect it is hardly a comforting symbol, especially for women. We have come to fear our breasts, to see them as potential enemies, to fight against the fatal genes they sometimes harbour. For many people today, breast cancer is the catalyst that has transformed the way we conceptualise the breast, so that we see it, first and foremost as a medical problem. Increasingly the medicalisation of the breast threatens to efface its erotic and maternal meanings.¹⁴

This is also reinforced by many women contemporary artists, as statistics for breast cancer are echoed by the numbers of artists whose work reflects their own experience of the disease. Of those listed above, Jo Spence and Frieda Kahlo both explored their experiences of the disease in their work (Fig 9). In Jo Spence's *Colonization*, we see her posing with her breasts uncovered holding a broom in the doorway next to two pints of milk on the doorstep. As in many of her photographs, she does not separate issues: they are all put forward to challenge the viewer to realise their own confusion, calling to question the dominant modes of visual representation, to 'breakdown some of the sacred cows of photography and bourgeois aesthetics'.¹⁵ Yalom comments:

...her heavy beads and pendulous bosom exposed for all the world to see, she looks like a working class British housewife taking herself for an African native, who is proud to pose for the white man's camera. Certain carefully staged juxtapositions, such as the two milk bottles and the two jug like breasts, suggest humorous connections, and point to subtle links between the women, her class and consumerism.¹⁶

Germaine Greer, feminist writer and critic, achieved near legendary status when she published *The Female Eunuch* in 1970. Constantly realigning her theories with contemporary issues, in her follow up, *The Whole Woman*, published in 2000, although criticised for her take on motherhood, she is able to discuss issues to do with the breast in a refreshingly forthright way, acknowledging that many common notions, like the pleasurable nature of breastfeeding or the relationship between breastfeeding and women's fears of breast cancer are rarely discussed. Surely this can only add to the generally felt taboo that is breastfeeding:

No research has ever been done on breast centred eroticism in bottle-fed as opposed to breast fed individuals. No sub - group of fetishists is turned on by bottle shaped breasts, as far as we know....Despite incessant interest in the breasts as triggers of erotic action, there has been no systematic investigation of the female breast as an erogenous zone. We have

¹⁴ Ibid, p.278

¹⁵ Ibid.,p.263

¹⁶ Ibid.,p.263



q. Frida Kahlo. *My Nurse and I*. 1937.



9. Colonization, by Jo Spence, 1996 (bottom), *My Nurse and I*, by Frieda Kahlo, 1937 (top). Both artists have explored their experiences of disease using the imagery of breasts, both liberating the breast and combining many related issues

not the faintest idea how many women find suckling pleasurable to the point of orgasm; the phenomenon, though common, is never discussed.¹⁷

Her controversial views on the pleasure of breastfeeding are visited again in 2.1.3. and are reviewed in the light of others theories on the subject. Meanwhile, her attitude to breast cancer and the influence it has on women psycho-sexually closes this section. In contemporary society concern about breast cancer continues to influence behaviour, diet and lifestyle in an increasingly noticeable way. Greer reminds us to take note of the warnings, and as the incidence of breast cancer around the world continues to rise steeply, she warns that the aesthetic breast needs to be treated with caution:

Too many menstrual cycles? Too little lactation? Women continue to die, and they are dying younger....In Britain the research budget (breast cancer) is a paltry £2-3 million which, taken together with the failure to identify at-risk women, and to set up appropriate treatment regimes for confirmed cases, shows us the downside of treating the breast as a plaything. A plaything that ceases to be amusing is bound for the trash can. It's time we stopped fooling about with breasts, time to take them seriously.¹⁸

The photograph in Fig 10, by Hella Hammid proposes that truer images of women's bodies such as this can help to take the fear out of breast cancer. The pure celebratory nature of this image is particularly impressive, and illustrates how the aesthetic breast is shallow in comparison to true beauty. This arguably is a beautiful image.

1.2 Breastfeeding

1.2.1 Statistics for Breastfeeding

The statistics for breastfeeding in the UK are as follows:

- 69% of women in Great Britain now choose to breastfeed their infants from birth.
- 57% of women abandon breastfeeding during the first six weeks.
- 29% are still fully breastfeeding at four months.
- In Northern Ireland, the statistics are considerably lower than elsewhere in the UK with only 54% of women choosing to breastfeed from birth.¹⁹

To summarise, less than one third of British babies is still being breast-fed at the age of four months and only 1% of those will breastfeed for longer than a year.²⁰

¹⁷ Greer, G, *The Whole Woman*, Transworld Publishers, (2000), p.60

¹⁸ Ibid, p.61

¹⁹ Hamlyn, B, Brooker, S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, (2002), TSO ¹⁹ BBC Television, *Watchdog*, BBC 1, 27.7.98

²⁰ BBC Television, *Watchdog*, BBC 1, 27.7.98



10. Deena Metzger, by Hella Hammid, 1996. Defying 2000 years of predominantly male authored art, Hammid proposes that truer images of women's bodies such as this, can help to take the terror out of breast cancer.

Surveys of infant feeding rates can now be found on The Internet, although the most reliable source for such statistical evidence is *The Infant Feeding Survey 2000*, published by *The Stationery Office (TSO)* in 2002. Statistics produced every five years indicate that breastfeeding rates have not significantly improved in the UK over the last fifteen years. Not only are there regional variations around the country but globally the picture is also diverse. Beginning with an example from the UK statistics, research by *The Health Education Board for Scotland* in 1996 clearly showed that the cultural norm in Scotland was to bottle-feed.²¹ They go on to suggest that the culture for breastfeeding could be changed through mass media approaches. However, Kendall (1995) argues that we need to look beyond the idea that behaviour will change by diffusion through the mass media alone and suggests that health professionals should work more intimately within the cultural frameworks with which they come into contact.²²

There have been many studies internationally which have attempted to show how breastfeeding rates can be improved through various methods of promoting breastfeeding. A paper by Renfrew et al (2000) commissioned by the NHS entitled *Promoting The Initiation of Breastfeeding* formed a systematic review of some such studies.²³ In summary, they found that:

- Women in social class V have the lowest breastfeeding uptake rates.²⁴
- Cultural factors such as media representation of artificial feeding as ‘normal’ are likely to influence the choice and ability of mothers to breastfeed.
- Facilities in public places for mothers to feed their infants are also likely to influence the choice and ability of mothers to breastfeed. No studies were identified which evaluated the impact of providing supportive environments, such as facilities for women to breastfeed in public places. None dealt with the design of or the positioning of furniture explicitly.
- Peer support programmes offered by experienced and trained peers may increase the numbers of women breastfeeding.
- Small informal discussion classes led by health professionals can increase initiation rates.
- Most breastfeeding training courses for health professionals have not been formally evaluated.

So what might the implications of some of these findings be on the proposal for a breastfeeding chair? It could be hypothesised that:

- Women in social class V probably would not want to pay for an expensive chair (see Conclusion). However, if chairs were to be provided in public places and were possibly available for hire from clinics and hospitals, women would not incur any personal cost, yet they would benefit from using the chairs.

²¹ HEBS/Scottish Office *Breastfeeding in Scotland: Final Report*, Edinburgh, Health Education Board For Scotland, (1994).

²² Kendall, S, *Health Visitor*, Vol.68, No.11, Nov., (1995), p.450.

²³ Renfrew et al, *Promoting The Initiation of Breastfeeding*, bulletin based upon a review commissioned by the NHS HTA Programme. The review was carried out by The Mother & Infant Research Unit, University of Leeds, July, (2000)

²⁴ Social class V refers to manual occupations as defined by the Registrar General’s classification of social class

- 1.2.6 (later) gives examples of how the media representation of breastfeeding is undoubtedly a massive influence on the public's opinion of breastfeeding. If breastfeeding were the norm, places to do it in comfort would need to be designed.
- The fact that no studies were identified which evaluated the impact of providing supportive environments, such as facilities for women to breastfeed in public places, is perhaps the most interesting for the purpose of this study. It could be argued that more women might be more attracted to breastfeeding if health professionals leading discussion groups or training programmes had access to well designed furniture and facilities for breastfeeding.

Cross-cultural behaviour, political influences, the formula milk debate, employment, and breastfeeding in the media will be discussed in more detail to help to indicate why perhaps more mothers do not breastfeed in the UK.

1.2.2 Cross Cultural References

In traditional societies all mothers breastfeed. Until of late, they have had no option. The increasing incidence of donations of formula milk to developing countries is changing the statistics for breastfeeding. Jacqueline Vincent Priya, in her acclaimed book *Birth Traditions and Modern Pregnancy Care*, noted that of all the places she visited no one she came across had been unable to breastfeed, or knew of anyone who had not been able to provide enough breast milk for their baby. Unlike in the UK and in most of the developed West, there is an assumption that every woman can and will be able to breastfeed in the less developed world.

Girls grow up in many societies seeing breastfeeding as an everyday activity, observing techniques from an early age. Ritual has a much more powerful role in societies other than our own. The weighing of babies and constant emphasis on 'getting enough milk' could be perceived as a Western ritual based on a more biomedical model of breastfeeding, but the sharing of spiritual and superstitious beliefs does, according to Priya, appear to be of much psychological benefit. She emphasises the lack of anxiety about breastfeeding in the countries she visited, and the calm, relaxed approach of the women she spoke to. Welcoming ceremonies, when the baby is first put to the breast, are often carried out by the women who help with the birth. Giving the baby a few grains of rice at birth, for example, symbolically tells her what she will be eating in a year's time.²⁵ It is this spirituality and psychological influence on the lives of women, particularly during pregnancy, childbirth, and the post birth period, that recurs in parts of the world where breastfeeding rates are high. In the UK one exception is the choice that many contemporary Western women make with regard to using a sheep's fleece as a comforting material, both for them to sit on and for their babies to sleep on (Fig 11). This is a design consideration founded on more than only its physical characteristics: it has good heat retention properties, is soft to the touch and psychologically comforting. Cuddling a small piece of sheepskin following a feed when the baby falls asleep appears to be used as a reward for many mothers (3.1). The use of a sheep's fleece can also be observed in North Africa, where they are sold alongside babies sleeping baskets in local markets.²⁶

²⁵ Priya, JV, *Birth Traditions & Modern Pregnancy Care* Element Books Ltd, (1992), p.117

²⁶ Jones, L, Observation by the author, Monastir, Tunisia, (2002)

11. Sheep's fleece is frequently used as a comforting material by mothers breastfeeding.





12. **Adoration:**

Madonna del Latte, by Ambrogio Lorenzetti, 14th Century AD. Her tiny unrealistic breast appears to be stuck onto her body like a decorative feature, as Cindy Sherman's portrayal of the Madonna in 1990 imitates (Fig 9).

Disgust:

As in today's media, The Express, 1997.

The power to nourish infants has provoked every emotion, from heavenly worship to disgust, crossing the boundaries of all cultures around the globe: worship, as in the paintings of the nursing Madonna; disgust, as in the attitudes still portrayed in much of today's media about breastfeeding in public (Fig 12). As Gabrielle Palmer points out in her highly acclaimed book *The Politics of Breastfeeding*:

Breasts are sexually stimulating, as are legs, lips and the nape of the neck. In societies where there is no shame about breastfeeding, man is not driven into a frenzy by the sight of a female breast, but he may be embarrassed or aroused by a woman wearing shorts as Victorian men were by female ankles.²⁷

Even in the most sexually repressed societies, women expose their breasts to feed their babies, whilst not being allowed to show their faces (Fig 13). In ancient Egypt, whilst human mothers are rarely shown feeding, goddesses are frequently depicted suckling an infant king, confirming him as thus, and celebrating his divinity (Fig 14). By way of contrast, fertility figurines from all early periods of Egyptian Art, do not depict women as belonging to an elite, but women as peasants or servants, often suckling her child whilst continuing with her job. The woman is frequently seen sitting on a stool or on the ground, supporting her child on her thigh, or she sits holding the child on her lap. Healthy breastfeeding posture is here perfectly illustrated as early as 2000 BC (Fig 15). Pottery vessels have been found in the form of a squatting woman holding her child whilst squeezing her breast to express milk. In Jewish and Christian traditions, breasts were honoured as milk producing vessels necessary for the survival of the Hebrew people and, later, the followers of Jesus²⁸

There is a well documented anecdote from Greece claiming that the first bowl ever made in Greece was shaped or moulded from the breast of Helen of Troy, a remarkably similar story to that told much later told about Marie Antoinette during the late Eighteenth Century.²⁹ She was believed to have commissioned two breast shaped bowls, which, as legend would have it, were moulded on her own breasts (Fig 16). Even today the Zuni women of North America make their pots in the shape of breasts³⁰ (Fig 17). Many such pots and vessels are deemed sacred, playing an important role in the lives of the people and many are still intended to contain and dispense expressed breast milk. This ritualistic integration of breastfeeding into everyday life could suggest why nowadays, with less of a ritualistic culture, breastfeeding is not so readily accepted into our daily lives.

It is important for the purposes of this thesis to acknowledge the posture of the mother in these culturally diverse examples. If breastfeeding whilst seated, the seat is usually low in height and the angle of her back erect; if the mother is standing, the child is usually no longer a baby and also stands:

²⁷ Palmer, G, *The Politics of Breastfeeding* Pandora, (1993), p.31

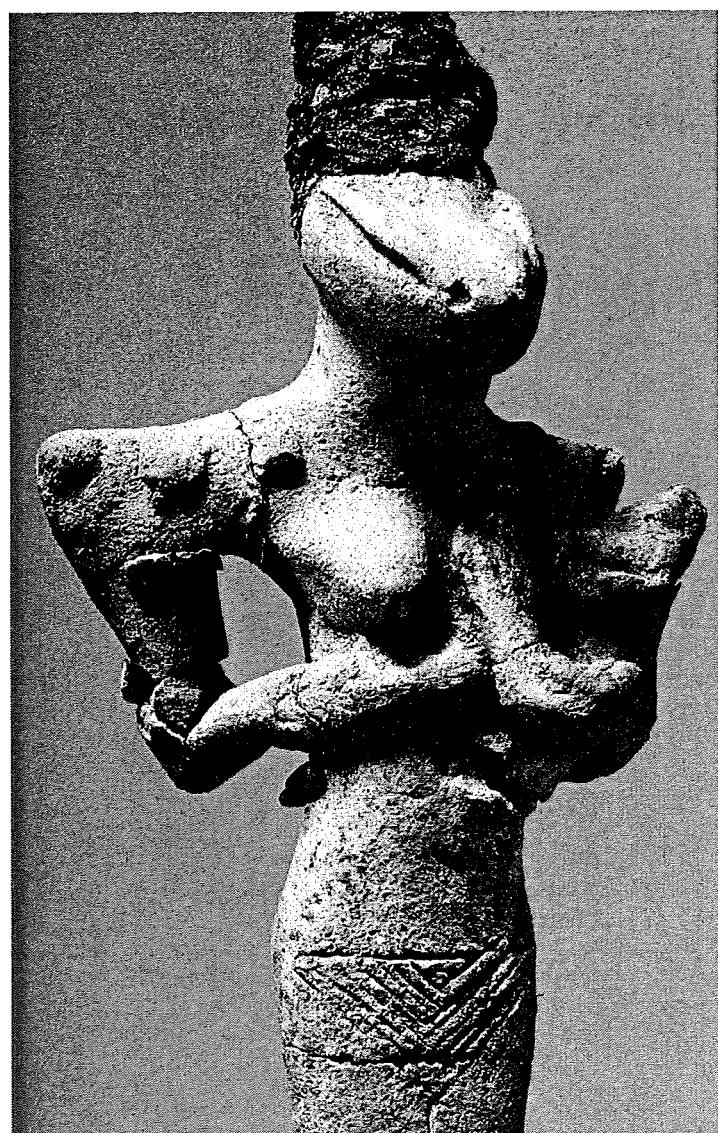
²⁸ Yalom, M, *The History of The Breast*, Harper Collins, (1997), p.5

²⁹ Ibid., p.113

²⁹ Getty, A, *Mother of Living Nature* Thames & Hudson , (1990), p.70

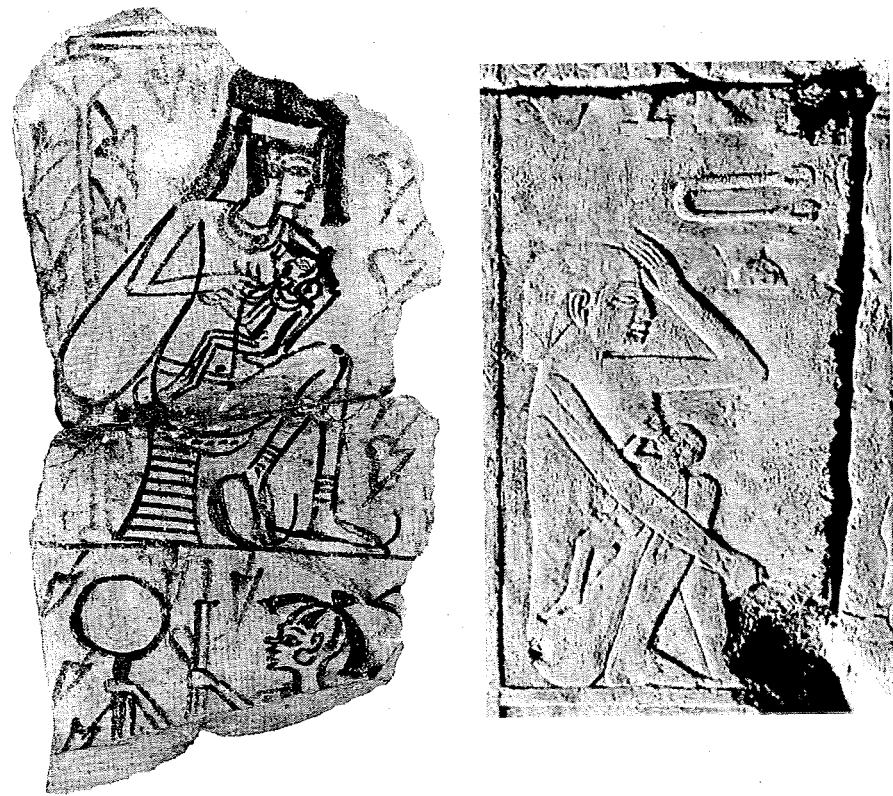


13. Even in the most sexually repressed societies women expose their breasts to feed their babies whilst not being allowed to show their faces.

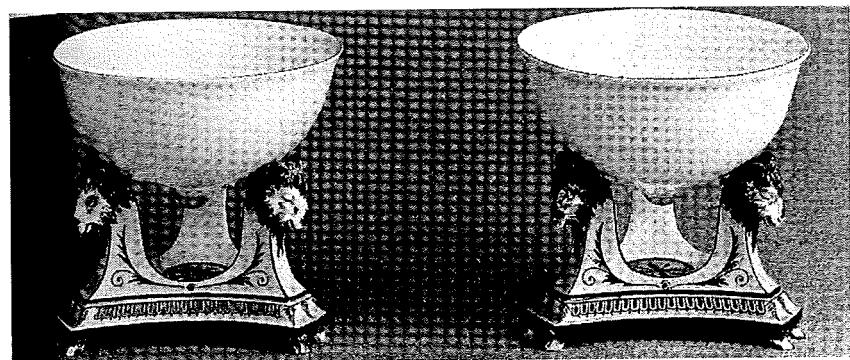


14. Goddess, Babylon, 4000BC, terracotta, height: 15cm.

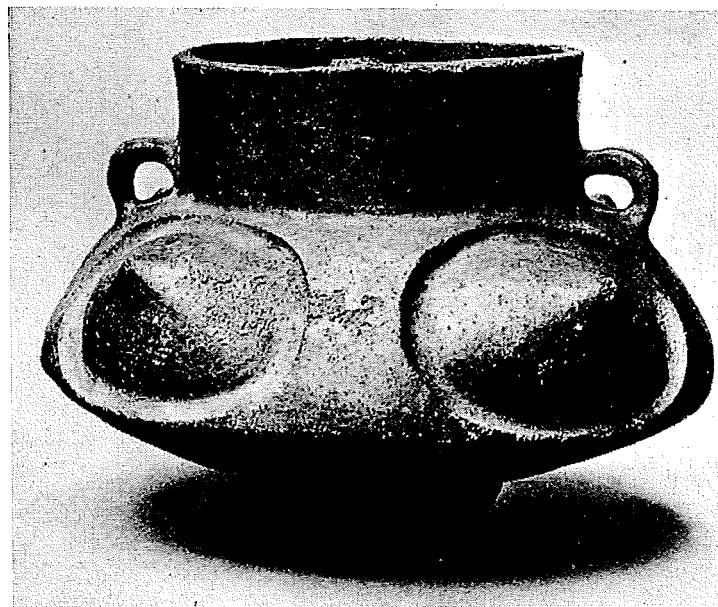
In one of the earliest portrayals of a woman breastfeeding, this goddess presents a haunting image of a sacred mother. With her smiling reptilian face she stands upright confidently feeding her infant.



15. Two examples of healthy breastfeeding posture, Egypt, 1500BC and 2000BC respectively. Both breastfeeding women sit on a low seat or on the floor, slightly leaning forward so that the breast falls forward.

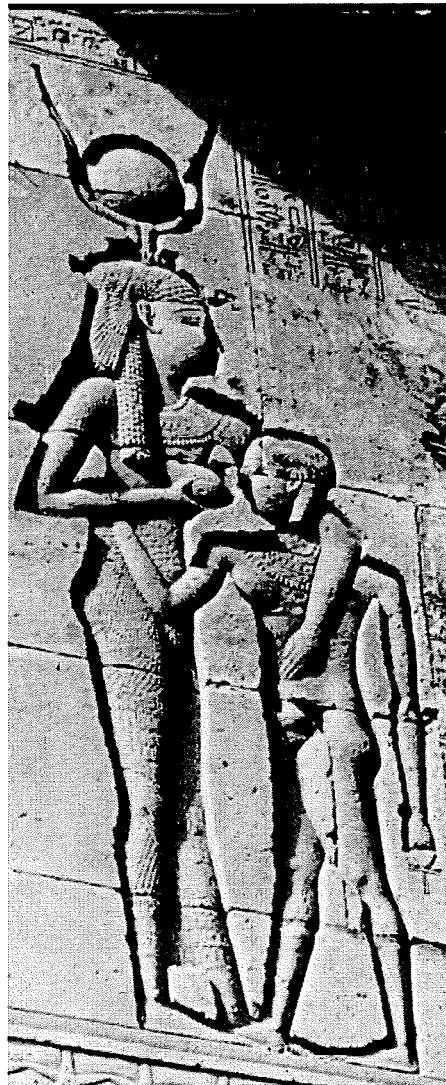


16. Two breast shaped bowls allegedly moulded on the breasts of Marie Antoinette.



17. Pot of Eastern Lausitz Culture, 1400BC

The Zuni women of North America even today make their pottery in the shape of breasts. The pouring of milk from the breasts represents a continuation of life : when a woman is viewed as a vessel, her abilities to nurture, provide, contain and protect are honoured.



18. Queen Isis, Egypt, 2000BC

She offers her breast to an almost grown Horus, perhaps to remind him of where the source of his power is located. The stance of both mother and son is confident and proud.

In Egypt, Queen Isis, known as the Lady of Abundance, offers her breast to an almost grown Horus, perhaps to remind him of where the source of his power is located. (Temple entrance carving, Dendera) The communion that Isis offered the world was one of bread which she made possible by discovering the corn, and of milk which flowed from her breasts. The initiate drank the milk from a cup that was modelled in the shape of a woman's breast, thus remembering that Isis as Mother Nature was mother to all.³¹ (Fig 18)

Another culturally diverse breastfeeding observation is that of attitudes to clothing and moreover modesty. Loosening and adjusting clothing to access the breast often makes the woman appear to be undressing, confusing onlookers. Palmer for example describes how:

Babies were breast-fed casually and publicly, including in church. Clerk Tom's young wife wore a fur tippet in winter and her breast hung like a white heather bell between the soft blackness until it was covered up with a white handkerchief, "for modesty". This modesty was not shame and it was taken for granted that breastfeeding in church was normal.³²

In a similar vein, Dr. Catriona Clear's new book *Women of the House* is a fascinating record of memories and accounts from women and their household work in Ireland between 1926 and 1961.³³ She is sensitive to the question of modesty at all levels being careful not to exclude sensitivity to her own place in the research process when asking people about breastfeeding. She suggests that a kind of false modesty could completely ruin healthy and happy breastfeeding.

In her book, Clear discusses Maura Laverty, an Irish novelist of the 1940's. who refers to breastfeeding more freely than many novelists.³⁴ In her 1946 novel *Lift Up Your Gates*, she characterises a young middle class mother Eileen Harte who delights in breastfeeding her little boy 'contrasting it to her own mother's furtive and over modest way of feeding Eileen's little brother under a voluminous shawl'. This kind of modesty remains an important issue for breastfeeding women. Whether or not they feel comfortable to be seen to be breastfeeding influences where they might choose to sit or what they would choose to wear. *Bravado Designs*, a small company based in Canada, in an effort to break down some of the modesty issues of breastfeeding, in 2002 launched their underwear for pregnant and lactating women out of the frustration of two mothers who lamented over the lack of attractive and affordable nursing bras:

Our philosophy recognises the importance of the breastfeeding relationship, and we strive, above all else, to bolster and enhance a mother's self image during this triumphant, yet sometimes difficult period.³⁵

These products however remain fairly exclusive and have not yet been seen on sale in high street stores in the UK (Fig 19).

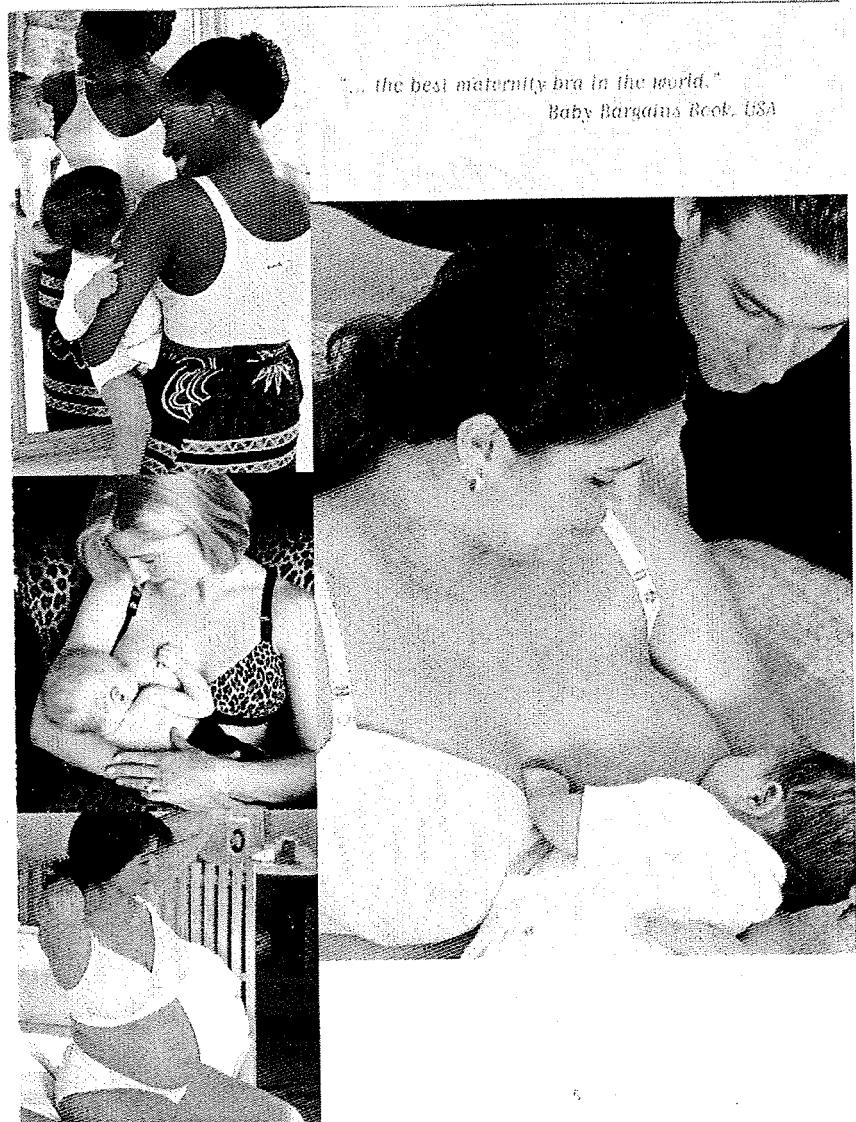
³¹ Ibid., p.73

³² Palmer, G, *The Politics of Breastfeeding*, Pandora, (1993), p.181

³³ Clear, C, *Women of The House*, Irish Academic Press, (2000)

³⁴ Clear, C, *Women of The House*, Irish Academic Press, (2000), p.140

³⁵ *Bravado Designs*, European catalogue, 2002



19. Bravado Designs, 2002.

This small Canadian company launched their underwear for pregnant and lactating women out of the frustration of two mothers who lamented over the lack of attractive and affordable nursing bras. Incidentally, all the models used in the brochure are friends or family of the two founders of the company.

The current design and advertising of breast pumps and associated paraphernalia clearly indicates how this kind of advertising imagery, abundantly aimed at breastfeeding women, does little to help women to approach the activity in a relaxed and confident manner (see Fig 2 earlier). There is again a lack of respect for her sexuality, emotional pride and for her dignity. The images shown later in Chapter 3 clearly show a variety of examples of this: Susan struggling to initiate breastfeeding with her clothing around her neck (Fig 6); Carly with her stomach protruding from her jumper as it is lifted to feed, and so on. By contrast, respect for the nursing mother can often be found in other cultures:

Double the food your mother gave you
Support her as she supported you
She had a heavy load in you
But she did not abandon you
When you were born after your months
She was yet yoked (to you)
Her breast in your mouth for three years
As you grew and your excrement disgusted
She was not disgusted, saying 'What shall I do?'
When she sent you to school
And you were taught to write
She kept watch over you daily
With bread and beer in her house.³⁶

In Australia where women can breastfeed in public with relative ease and where it is the cultural norm to breastfeed, more than 50% of mothers are still breastfeeding three months after birth.³⁷ The country encourages breastfeeding like no other, whilst breastfeeding mothers from Britain and many parts of the US remain in the minority. It has been suggested that the introduction of milk substitutes and the promotion of them by industry and by the medical profession may have influenced the dramatic decline in breastfeeding in America since 1940.³⁸ By contrast, in Australia, it is rare for a woman not to breastfeed. Australian mothers are asked to sign a consent form before their baby is given formula milk and it is considered negligent, to deprive a baby of breast milk. Clearly this is also not the way forward; to instil fear at such an emotionally delicate time seems insensitive. Whether it is the mother's right to choose to breastfeed or not, or whether there is a baby's right to breast milk is today a matter for debate.

In other countries where breastfeeding is more commonplace, within Islamic law for example, there is tremendous support and encouragement for breastfeeding within the community, although it is only within the community of women that breastfeeding can be witnessed. Islamic law states:

³⁶ Yalom, M, *The History of The Breast*, Harper Collins, (1997), p. 79

³⁷ Ibid, p.142

³⁸ Brack, D.C., *Social Forces, Feminism and Breastfeeding*, p.556, cited by Yalom, M, *The History of The Breast*, Harper Collins (1997), p.141

³⁹ Maher, V, cited by Kendall S, *The Health Visitor*, Volume 68, No.11, (Nov. 1995), p.450,

The mothers shall give suck to their offspring for two complete years, for those who desire to complete the term.³⁹

My enquiries in Islamic Tunisia (2002) indicate that although breastfeeding is the norm it is impossible to witness, as women move within a social structure almost totally separated from their men. The only women I saw held their babies in a sling and were always street beggars. Otherwise the street cafes and all the shops in the medinas in the towns are only inhabited by men. (The segregation of men and women is much more evident here than in non-Islamic countries.) Vanessa Maher in her anthropology of breastfeeding cites a Tunisian model among the Khmir tribe, whereby she describes the phenomenon of 'bad milk'. Rather than the typical Western tendency to focus on the *amount* of milk a baby gets, here their concern is with the quality of the milk and its perceived effect on child health:

A ritual performed on the child, which, as mother and child are believed to be one, cures the mother of her bad milk and restores her place in the centre of the house.⁴⁰

The importance of ritual needs to be recognised as a very powerful and successful supportive structure and perhaps with the less ritualistic lives led by women now in the UK, the supportive network for successful breastfeeding is weakened, therefore contributing to the much lower breastfeeding statistics recorded in this country. The political significance of breasts also has its part to play in the supportive network: women's breasts have been politicised by a variety of governments for a variety of causes, especially in times of war.

1.2.3 Political Influences

The influence of politics on the history of breastfeeding both in the UK and more globally cannot be ignored and certainly in establishing the need for a breastfeeding chair, hypocrisies and confused moral and political influences blur the rationale. Politics have had a massive influence on women's decision to breastfeed around the world and the first part of this section aims to summarise that political influence; the second part will focus on historical issues less directly influenced by political action but nevertheless politically charged. Many political agendas come to the fore throughout history, which influence the actions of mothers and those products used by them. Although *The World Health Organisation* states that the majority of women, 97% or more, are physiologically capable of breastfeeding successfully the statistics for breastfeeding in the UK give a clear indication that several factors - social, political or otherwise deter women from doing it.

It is organisations like the *World Health Organisation* and *La Leche League* who currently lead the political debate in favour of breastfeeding, the latter being the oldest and most powerful. Their advice however, bears no comparison by historical standards to the pressures put on women during the Nazi period. At a time when the glorification of the male body dominated Nazi

⁴⁰ Creyghton, ML. *Bad milk: perceptions and healing of a children's illness in a north African society*. Cited by Kendall, S in *The Health Visitor*, (Nov. 1995), Vol.68, No. 11, p.450, from Maher V(ed.), *The Anthropology of Breastfeeding*, Berg , (1992)



20. Nazi propaganda poster from the 1930's.

"Germany grows from strong women and healthy children." To promote breastfeeding during the Nazi period, this poster of mother and child mimicked the traditional image of the nursing Madonna.

propaganda for example, women were portrayed only as breeders and nurturers of Aryan children. (Fig.20). At the same time in France, another Government enforced scheme for breastfeeding attempted to make breast milk available for babies. Mothers were housed, fed and paid a nominal amount to express their excess milk. It was taken four times a day by machines, similar to those used for cows, then sold. Centres like this disappeared with the beginning of World War II and it is no surprise that they did not re-emerge.⁴¹

More recently, America and Australia provide some of the most startling of political contrasts. New York State did not allow breastfeeding in public until this repeal of the law in 1994. New York Law, May 16th, 1994:

Right to breastfeed. Notwithstanding any other provision in law, a mother may breast feed her baby in any location, public or private, where the mother is otherwise authorised to be, irrespective of whether or not the nipple of the mother's breast is covered during, or incidental to the breastfeeding.⁴²

It remains illegal for women in California to breastfeed in public.

As a result of stark comparisons around the world, several governments identified the lack of supportive structures for breastfeeding as a very serious and deep-rooted global problem and developed and signed the *Innocenti Declaration*.⁴³ Developed by these governments and ten UN Agencies, it calls for a radical approach to national and social policies in order to create a healthier breastfeeding culture.⁴⁴

In 1981, most of the participating organisations formed the *World Alliance for Breastfeeding Action* set up by the *World Health Organisation* to co-ordinate their efforts, followed soon after by *UNICEF* launching its *Baby Friendly Hospital Initiative* to try to encourage maternity departments to implement the manifesto: *The Ten Steps to Successful Breastfeeding*.⁴⁵ This code was a result of this international collaboration, and although it does not prevent mothers from breastfeeding, as neither *WHO* or *UNICEF* are law enforcing bodies, it does universally seek to encourage and maintain the woman's right to breastfeed and the baby's right to have access to his mother's milk. The code's aim is:

To contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breastfeeding and by the proper use of breastmilk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution.⁴⁶

⁴¹ Yalom, M, *The History of The Breast*, Harper Collins, (1997), p. 141

⁴² Ibid., p.141

⁴³ Palmer, G, *The Politics of Breastfeeding*, Pandora, (1993), p.274

⁴⁴ Ibid., p.275

⁴⁵ The Royal College of Midwives, *Successful Breastfeeding*, Longman, (1995), p.48

⁴⁶ Palmer, G *The Politics of Breastfeeding*, Pandora, (1993), p. 254

In the UK Britain has always voted in favour of the *WHO* code, which applies to the promotion of all breast milk substitutes, including follow-on milk and other products that can be given using a feeding bottle, as well as utensils such as feeding bottles and teats, calendars, cot tags, tape measures and mugs. However, commercially in shops, supermarkets, and motorway service stations some suppliers find ways around the ruling (3.5.2). Included in the code are the ten following provisions:

1. No advertising of breast milk substitutes.
2. No free samples to mothers or members of their families.
3. No promotion of products in health care facilities.
4. No company personnel to advise mothers or members of their families.
5. No gifts or personal samples to health workers.
6. No words or pictures idealising bottle-feeding, including pictures of infants on the labels of the product.
7. All information on infant feeding including product labels should explain the benefits of breastfeeding and the costs and hazards associated with bottle-feeding.
8. Information to health workers should be scientific and factual only.
9. Unsuitable products such as sweetened condensed milk should not be promoted for babies.
10. All products should be of high quality and should take into account the climatic and storage conditions of the country where they are to be used.

Pictures of ‘bonny babies’ on tins of formula milk from the 1960’s can be seen at the *Wellcome Trust Archive*, but surveys of products currently stocked on the shelves of supermarkets illustrate how manufacturers today have cleverly manipulated rule 6 above, for example, by using equally seductive imagery (Fig 21).

All baby milk and bottle and teat packaging project idealised images of product-consuming glamour. If you lead a hard life this picture can provide a fantasy of health and wealth, but if the product leads your baby to illness and death it can prove a costly one. The allure of packaging is universal and rich and poor alike select products on this superficial basis, which is why companies invest so much in its design.⁴⁷

After the 1981 adoption of the *WHO/UNICEF* code companies around the world are found to increasingly write weakened versions of the original. Most famously *Nestle* regularly feature in the media as having boycotts set up against them for breaking the recommendations of the code.

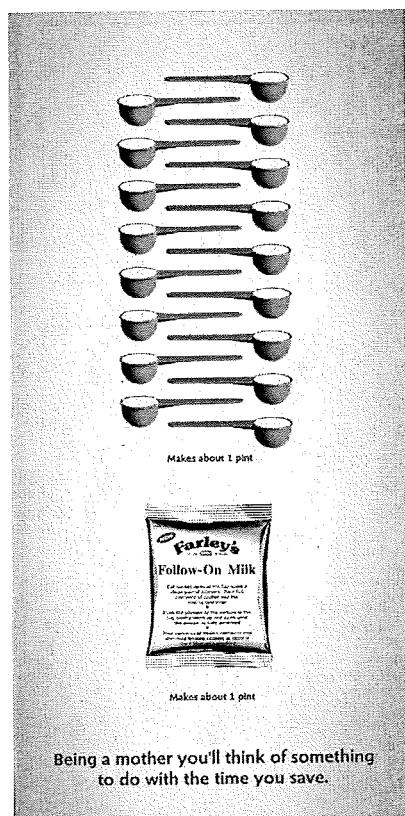
1.2.4 The Introduction of Formula Milk and Its Effects

The decline in breastfeeding rates worldwide is frequently blamed on the development of formula milk as an alternative to breast milk. The promotion and marketing of formula milk by large, multi-

⁴⁷ *Ibid*, p. 259



21a. The packaging of formula milk from the 1950's and 1960's.



21b. 2002 : The manufacturers of formula milk today still break rule no.6 of the WHO code: "There must be no words or pictures idealising bottle feeding."

22. Formula milk is aggressively advertised in highly inappropriate situations. This was most evidently the case during the 1960's and 70's.



national milk companies such as *Nestle*, mentioned earlier (1.2.3) and *Cow & Gate*, although now restricted by Government legislation (1.2.3) are still aggressively advertised in highly inappropriate situations especially in Third World countries (Fig 22). Lack of facilities providing uncontaminated water means mothers have no choice other than to have to use contaminated water to mix with their powdered milk. The reasons why mothers choose not to breastfeed in those situations seem unclear, but it is known that even in undernourished mothers the quality of breast milk remains remarkably high so that any supplementary feeding should not be an available option particularly where the water is known to be contaminated. An article published in *Spare Rib* in 1980 suggests that breast milk should be available by prescription only in all countries and in all situations. In Papua New Guinea and some regions of Australia this is now the norm, but elsewhere countries rely on improving access to information and the education of women about the advantages of breast milk. Most worryingly, some countries actively promote formula milk as a healthier option:

Women in all countries are constantly told it is to their advantage to bottle-feed. By implying that breast milk can be insufficient, the industry makes women feel inadequate. Artificial milk is given a more modern, Western, clean image....Yet both milk powder company personnel and nutritionists acknowledge that breast milk is better than artificial infant milk.⁴⁸

So this being the case, how can the manufacturers of formula milk so aggressively promote a product they know to be so damaging? Thousands of babies fed on artificial milk are still dying every year despite the WHO/UNICEF initiative (1.2.3). Financial gain offers the only feasible justification. Allied products such as bottles and teats must also add to profits to be made from formula feeding. Much of the current marketing of feeding bottles and accessories, especially teats for bottles, suggests that the WHO/UNICEF code described earlier (1.2.3) is frequently ignored. We are warned unreservedly in *Successful Breastfeeding* that:

Commercial literature suggesting that any teat is similar to the breast should be disregarded.⁴⁹

Apart from the well-reported effects of women using contaminated water to make formula milk in the developing countries, there is little reported evidence to suggest why women might choose formula milk over breast milk in the developed world. Certainly in North Africa (2002) I found no evidence of formula milk for sale in the supermarkets, which would support the earlier notion that breastfeeding is the norm in that country.

In the UK Hoddinott & Pill (1999) in their study about infant feeding among women in the East End of London concluded from their sample of women that when breastfeeding was witnessed as part of normal everyday life by both the woman and her family and friends, she was more confident in her own ability to breastfeed and more committed to her decision. She therefore did not consider

⁴⁸ Lumb, F, *Spare Rib*, (October 1980)

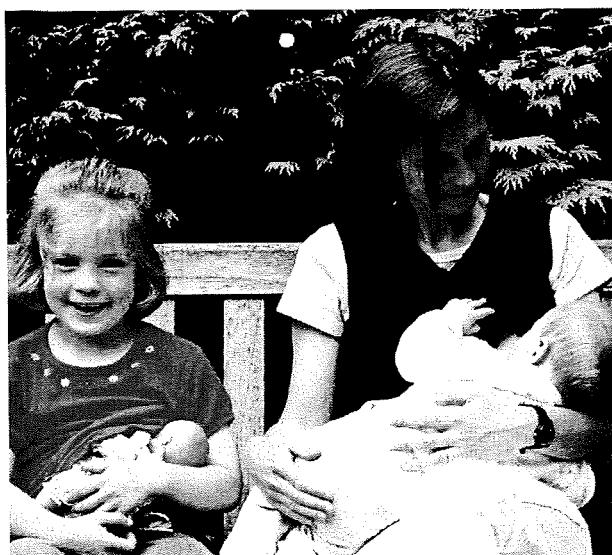
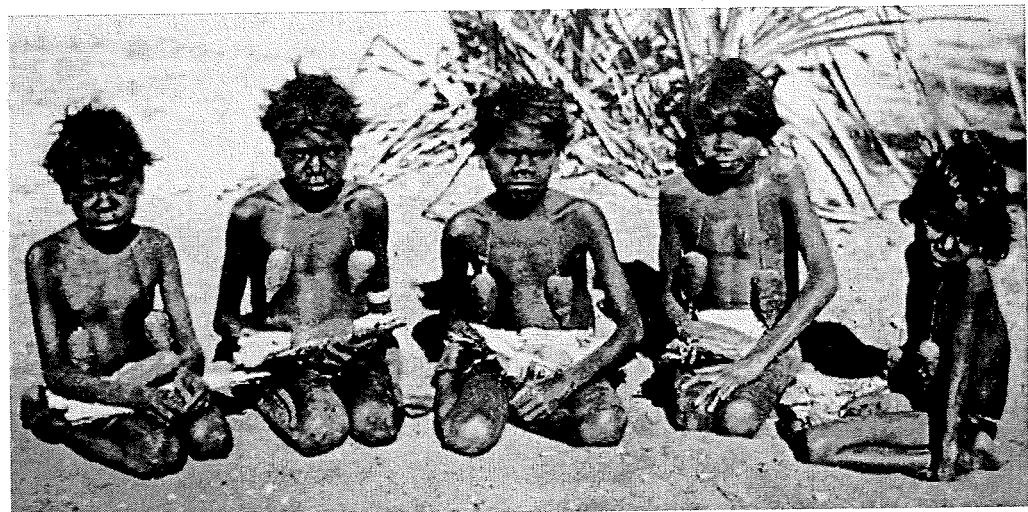
⁴⁹ The Royal College of Midwives *Successful Breastfeeding*, Longman (1995), p. 14

*It is breastfeeding.
You find it completely
providing a great bond
of closeness
you and your baby.
Also protecting yourself
against premature
uterine cancer
and osteoporosis.*



23. The seated position for bottle feeding should be different to that of breastfeeding:

- **Different angle of baby**
- **No need for the mother's breast to fall forwards**
- **Different position of the mother's lap**
- **Different position of the mother's arms**



24. Being brought up with breastfeeding role models is commonplace in Australia as demonstrated with these little Aboriginal girls playing with their dolls, but not in the UK: every single baby doll advertised in mail order catalogues is portrayed with a bottle. The image of the mother breastfeeding beside her daughter (bottom left) who imitates her, is not a typical scene in the UK.

Are you ready yet?

You are now...

The Electric Steriliser Starter Kit

with unique
HEAT SENSING bottles
and **VARIFLO™** teats.

Simple Brilliance

From the makers of the award-winning Microwave Steriliser Starter Kit comes the most advanced Electric Steriliser yet. The Maws Electric Steriliser isn't just fast. It has a sleek new shape, a unique buzzer to tell you when your bottles are ready and comes apart into three pieces for easy cleaning. Best of all you get everything you need to feed your baby including four **HEAT SENSING** bottles—the only ones with a safety stripe so you can see at a glance if the feed is too hot—and the famous **VARIFLO™** teat, clinically proven to reduce crying and colic symptoms.

Each kit contains 4 x 250ml Heat Sensing bottles,
4 Variflo teats, bottle brush and test vongs.
For more information
phone free on 0500 97 98 99,
or e-mail: helpline@jacket.co.uk

MAWS
pure simplicity

It's advanced but so simple, and it's only from Maws.

25. Advertisement for Maws formula milk, 2002. The power of advertisements like this one contribute to low breastfeeding rates.

formula feeding at all.⁵⁰ This is reinforced by similar reports from the US, where a combination of factors including *Baby Unfriendly Maternity Hospital Practices*, where babies are routinely given bottles of formula, aided and abetted by the aggressive practices evidenced by the formula food company's marketing strategies, all contribute to lack of confidence.⁵¹ Vanessa Maher in her study of women in Morocco (1992) suggests that the women turn to formula feeding as a way of gaining some control for themselves within a male dominated society.⁵² An increase in the production of cash crops rather than crops for their own consumption meant that the men had financial control. By turning to formula feeds, the women were able to have legitimate access to some of the cash, which their labour had produced, whereas breastfeeding meant no money and a lack of control over their own lives. Other examples cited by Maher include comment on areas in Africa where long hours of physical labour dictate that it is not always possible to breastfeed a baby frequently during the day, work once again prohibiting breastfeeding.

It should be recognised also that the seated position for bottle-feeding should be quite different to that of breastfeeding (Fig 23). As it is the cultural norm to see women bottle feeding in many areas of the UK, for example, many women make the mistake of adopting the same position for breastfeeding, which can lead to problems as a result of poor positioning. Chloe Fisher, senior midwife at the breastfeeding clinic at The John Radcliffe Hospital in Oxford confirms that:

Industrialised Western Society has become unfamiliar with the sight of a mother breastfeeding in public. As a result it may be imagined that the baby with a breast in his mouth should look much the same as a baby with a bottle teat in his mouth. This is not the case as the sucking action on the breast is mechanically different from that on the bottle.⁵³

Not witnessing breastfeeding everyday adds to the difficulties women now have with breastfeeding in the UK. In Fig 24 we see a small group of children playing at breastfeeding their dolls in Australia and next to it a rare image of the same thing in the UK. The girl in the park on the right is mimicking her mother as too are the girls on the image on the left. However, this is an extremely unusual sight in the UK.

Feeding with formula milk is still far more popular in the UK than in most other Western countries. At only four months after giving birth, a staggering 87% of British women bottle feed.⁵⁴ The power of advertisements such as those illustrated in Fig 25 must therefore be certainly contributing to that statistic. The currently running advertisement for Maws (2002) is also contravening the WHO initiative mentioned earlier (1.2.4) by not mentioning anywhere that breastfeeding is best for babies (see later, case study *Janet* who exclusively bottle-fed from birth).

Men are often cited as having pre-conceived ideas about the effects of breastfeeding on the shape and performance (sexually) of breasts and are known to persuade some women that it just isn't a

⁵⁰ Hoddinott & Pill, writing in the BMJ(2nd Jan. 1999), Vol.318 p.30

⁵¹ www.promom.org/bfpage.htm, (June 1st 2000)

⁵² Maher, V, *The Anthropology of Breastfeeding* , Berg, (1992), p. 156

⁵³ Fisher, C, *Breastfeeding: A Midwife's View*. Maternal & Child Health, (Feb 1981), p. 52-57

⁵⁴ Burchill, J, *Breastfeeding? It Sucks*, The Guardian, (12/5/99), p.9

good idea. It is true that some women complain that their breasts 'sag' after breastfeeding. However it is also true that many women do not: some even prefer the shape of their breasts after having breastfed. The risk of losing her mate to a more youthful breasted woman is as feared today as it was during the Eighteenth Century. In some cases, then as now, a husband demanded that his wife not breastfeed:

Sucking ruined a beautiful bosom. A nursing breast was not his breast. He wanted her back to perform her wifely duties, that is, to sleep with him. Neither wives nor wet nurses were supposed to have intercourse while breastfeeding, for it was thought that breast milk was formed in the uterus from menstrual blood.....Intercourse was thought to cause menstruation which would then jeopardise or taint the flow of milk to the infant. Men concerned with progeny and heirs wanted fruitful wives and the less those wives lactated the more they multiplied.⁵⁵

The irony of this is therefore that wet nurses, rather than 'liberating women to pursue their fancies'⁵⁶ as women may have believed, actually resulted in wives spending much more of their time pregnant.

Working away from home, however, was perhaps responsible for the biggest shift to bottle-feeding during the Industrial Revolution, when working women had to ask permission to stop work: the new organisation of labour did not allow for pregnancy and childbirth.⁵⁷ The emancipation of women has probably done more to disempower women in that respect, than to support it, especially post Second World War.

1.2.5 Employment and Breastfeeding

Maternal employment is a well-documented reason for women to give-up breastfeeding. On returning to work, particularly full time work, many women cannot sustain breastfeeding, and decide to wean their babies onto formula milk. For the few who do try to maintain the feeds the situation can be fraught with obstacles, ranging from having nowhere to express milk to maintain production, to being judged for leaving work on time to go home to feed. Anecdotal evidence is abundant:

I went back to work when Charlie was six months old. I'd used a hand pump for my daughter Perry, which was really hard work. I got cramp in my hand before I'd even got any milk, and it made me really sore. I kept the pump and a steriliser at work so I didn't have to keep carrying everything backwards and forwards. The only problem I had was finding somewhere private at work to express in - my let down reflex wouldn't work if I was tense or in a hurry.⁵⁸

⁵⁵ Angier, N, *Woman Virago*, (1999), p. 157

⁵⁶ Ibid, p. 157

⁵⁷ Palmer, G, *The Politics of Breastfeeding*, Pandora, (1993), p.176

There are a handful of enlightened companies who offer employees facilities where they can breastfeed or pump milk although few have been yet reported of in the UK. Many stores now in the UK however do acknowledge the need at least for a breastfeeding chair by putting an easy chair (usually of inappropriate ergonomics) in their baby changing room, supposedly for mothers to either breast or bottle feed on. This does not however address the issue of providing facilities for employees rather than visitors or customers. In 1998 *The New Yorker* ran a Mother's Day cover of a tough boot clad helmeted female construction worker suckling her infant whilst sitting, notably with her lap raised, on a steel girder high above the city (Fig 26). The stylishness with which this was handled was impressive, evidence that it is not difficult to offer positive images of breastfeeding to encourage more women to force the issue in their places of work.

A 'Breast Feeding Advocacy' web site suggests:

An employer only need make minor accommodations to allow employees to breastfeed their babies. With a clean private space and about twenty minutes every four hours, a mother can express her milk for later use by her baby. With on site or nearby day care, a mother can breastfeed her baby directly during brief breaks.⁵⁹

Sadly though few employers seem interested.

Kendall writes about the importance of considering the role of women in the workforce, their contribution to the economy and to the family, and the extent to which breastfeeding is perceived to hinder this, in her paper on *Public Health and Breastfeeding* (1998) she asks:

Has economic independence and the need for women to have some power within a male dominated society contributed to our own decline in breastfeeding rates? Should we be looking more closely at how we can enable women both to work and breastfeed successfully?⁶⁰

She cites an Australian example of a campaign in 1993, which tried to address some of the inherent difficulties of maintaining breastfeeding in a working environment which is often male dominated and lacking childcare facilities. Negative attitudes to breastfeeding prevail in many such situations. The document produced was titled *Mother Friendly Workplace Initiative* and was introduced in association with world breastfeeding week. In summary, the argument proposes that if employers were to support women with appropriate childcare facilities near to the workplace, provide comfortable furniture and private facilities for breastfeeding and expressing milk and generally instil a positive attitude towards breastfeeding at work, they will reap the economic benefits. The document argues that:

⁵⁸ *Mother & Baby Magazine*, (Feb 1997), p.38

⁵⁹ www.promom.org/bfpage.htm, (June 1st 2000)

⁶⁰ Kendall, S, *Breastfeeding and Public Health*, (2001). In press: Cowley S, (Ed), 2001 *Public Health in Policy and Practice*, Harcourt, London.



26. The New Yorker, 1998. Mother's Day Cover, showing that it is not difficult to offer positive images of breastfeeding to encourage more women to force the issue in their workplaces.

Breastfeeding women are less likely to be absent from work as their children are healthier and the morale of the women is better as they feel more able to meet their family responsibilities. This will lead to higher productivity. Breastfeeding is environmentally friendly leading to only biodegradable waste and as more women breastfeed at work this would have the effect of the workplace becoming a cleaner and safer place for everyone to work in. Economically as more women breastfeed there would be savings on the health service budget.⁶¹

Although some workplace initiatives have developed in the UK, this is usually as a result of individual pressure rather than integrated policy and most employers do not recognise the positive benefits that a strategy as illustrated above can have.

Employment conditions that enable women to continue to breastfeed clearly seem to be a good idea. But the idea supposes such a radical change in our ideas of work, our ideas of women and our ideas about ourselves, that it would seem that women need to firstly stay in the workforce in order to influence any change. This becomes increasingly difficult as working hours get longer, travel away from home is more of a requisite and men continue not to realise that they too can influence changes in policy. Recent policy change (2003) with regard to paid paternity leave for fathers and longer maternity leave with pay for mothers does indicate some improvement in awareness.

Media influences have a far-reaching and very deeply rooted part to play in the roles women both at work and at home. The section that follows discusses the ways in which breastfeeding women are pigeon holed by the media and marginalised by society and how the forces against breastfeeding seem to evolve. Breastfeeding at work as a theme recurs throughout this section.

1.2.6 Breastfeeding in the Media: Twentieth Century

The seductive imagery common in most women's magazines and aimed at women from teenage to about twenty-five seems to cease to be evident from the moment that a woman becomes a mum. Portrayals of women as mothers can be tremendously powerful influences on how a mother perceives herself. At a time when many a woman's image of herself is often low through tiredness and a general lack of self esteem, magazines such as *Mother & Baby* and *Parenting* can seem daunting to a new mother. Images of smiling, confident, beautiful, slim, often bottle-feeding new mothers (most typically featured in *Hello!* and *OK!* magazines) looking out from the pages confuse new mothers making them feel inadequate, fat, sore, frustrated, and not at all how the mothers in the magazines appear. Though some articles about breastfeeding featured in *Mother and Baby* type magazines do emphasise the importance of latching on for example, few show accurate pictures of correct positioning (2.2.4). Even images used to illustrate latching on often indicate bad latching on or nipple sucking (2.2.4). A new periodical *Bare*⁶² however does seem to be setting the

⁶¹ Kendall, S, *Public Health and Breastfeeding*, (2001). In press: Cowley S, (Ed), 2001 Public Health in Policy and Practice, Harcourt, London.

⁶² *Bare Magazine*, (Jan/Feb 2001)

scene for some improvement, as too does *Junior*, which offers a refreshing alternative to other magazines of it's kind, showing mothers in a more realistic light and discussing issues such as low self esteem in early motherhood and the importance of body fluids like breast milk. Such examples though remain few and far between.

Topical newspaper articles provide more evidence of the ignorance surrounding breastfeeding on a regular basis: 'I can't see Mr Blair managing the 2am bottles, can you?!'⁶³ This flippant reference to bottles typifies the mind set regarding breastfeeding in the media today. 'Breast or Bottle?' read a newspaper headline prior to the birth of the Prime Minister's son recently.

Another headline reads:

MP's Breastfeeding Ban - Women MPs are to be banned from breastfeeding their babies in *The House of Commons*. It was reported that "ex-tiller girl, now current Commons Speaker Betty Boothroyd made the ruling in May 2000 after the issue was raised by a labour MP who continues to argue against the ruling by stating that babies are quiet when being breast-fed."⁶⁴

With currently more than 100 women MP's in *The House of Commons* it is hard to imagine this ruling being upheld, yet time and again we find examples like this of confused etiquette surrounding the issue of breastfeeding. It seems to be taken for granted that breastfeeding should happen behind closed doors. Cherie Blair is far from exempt from being damned by her colleagues for breastfeeding in public (Fig 27). An incident which happened in June 2000, still being reported on in June 2002, seems to have brought her credibility into question. Paul Dacre, editor-in-chief of *The Daily Mail* is allegedly responsible for much of the animosity felt towards her:

He was apparently appalled and incensed when Mrs Blair breast-fed baby Leo in front of him during a dinner party in *Downing Street* in the summer of 2000. The "incident" which took place in front of an aghast Mr Dacre and Lord Rothermere, is seen as a seminal moment in the relationship between the prime minister's wife and the paper.⁶⁵

The integration of mothers and babies into day to day life is still long awaited. Look again at the toy pages of a recent Argos catalogue⁶⁶ (Fig 24). The 'toys for little girls' section features toddlers, no more than 2 or 3 years old, playing with their baby dolls. Six bottles can be spotted on this one page, with three of them featured as 'pocket money toys'. Appealing to slightly older girls *The Spice Girls* made it popular to be pregnant, and to be seen to be pregnant but how many of them did we see breastfeeding (Fig 28)?

With television advertisements and soap operas showing even new born babies as bottle fed in this country, women are conditioned to feel ashamed to breastfeed in front of others often feeling

⁶³ Lawley, S, *Desert Island Discs*, BBC Radio 4: Interview with Norma Major, (20/5/2000).

⁶⁴ *The Richmond Informer*, (12/5/2000), p.10

⁶⁵ Dillon, J, 'Saint or Sinner – Why Have They Got it in for Cherie?', *The Independent on Sunday*, (23rd June 2002), p. 19

⁶⁶ *Argos Autumn/Winter catalogue*, (1999)

Politics

Saint or sinner, why have they got it in for Cherie?

Her clothes, her smile, her failure to know when to wear a hat or when to keep her mouth shut; Mrs Blair can do nothing right. But could it be that she created her greatest enemy by breastfeeding in front of the editor of the 'Daily Mail'? **Jo Dillon** reports



Cherie Blair is not on the government payroll. She is not an elected representative. So why is the Prime Minister's wife increasingly seen as fair game by those who oppose her husband's politics?

The attacks on Mrs Blair have grown over the years since Labour came to

power - MR scare or that's her failure a yawn at the na... giving for the Qu... most energetic two full-page co... week to the

about Mrs Blair, although senior Conservative sources admit they are asked about her almost every day. Privately, they believe she has "brought it on herself" by being "up-front and political". Some have compared her to Hillary Clinton, the wife of the former US President, who followed a long line of overt

While keen i... Labou... ceas... Thanc... now I... As f... doesn'



27. 'Saint or Sinner?' Cherie Blair, damned by her colleagues for breastfeeding in public.



28. The Spice Girls are the ultimate role model for millions of young women: we may have seen them pregnant but did we see them breastfeeding?



29. Jerry Hall, 2000, with son Gabriel. She poses for the camera in a position not conducive to breastfeeding.

obliged to ask permission, in case somebody is offended. Both women and men continue to be embarrassed. Yet at the start of the new year of 2002 it was a refreshing contrast to see Norman 'Curly' Watts and his newly wed policewoman wife more than once portrayed breastfeeding in the iconic popular soap *Coronation Street* amidst a chaotic set strewn with nappies and baby wipes. Whether the breastfeeding continues in the story line remains to be seen.

Role models are vitally important in a world so media influenced. One of the few celebrity images of a woman breastfeeding is of Jerry Hall and her son Gabriel⁶⁷ (Fig 29). In this staged photograph by Annie Liebovitz, her direct and piercing look at the camera does not convince that this is a natural pose. She not only risks him urinating on her fur coat as she sits in a position not conducive to a relaxed feed, but we see that ergonomically for breastfeeding, her lap is too low and her back too slouched. On the other hand, it is encouraging to see her looking empowered and assertive, and, to see her breastfeed in public at all.

OK! and *Hello!* magazines are currently the two biggest selling celebrity chat magazines in the UK. They inform their buying public of the lifestyles of the rich and famous. The rich and famous featured in them allegedly receive vast amounts of money for the exposure of their private lives. The following examples were featured in different weekly issues of both magazines between 2001-2002. All the mothers are featured bottle-feeding their babies at only a few days old. As yet (2002) none of the celebrity mothers featured in *Hello!* or *OK!* are photographed breastfeeding. Jordan, famous for topless modelling, is perhaps the most stereotypically confusing example.⁶⁸ Her gaze is distant and her pose artificial. Her first baby, Harvey is ten days old. There is something disturbing about her manner as though she is unaware of her baby's presence. In the related interview she speaks of how much she worries about her looks:

During the birth they kept trying to sponge my face down with cool water and all I could do was shout "Be careful of my hair!" because I didn't want it to go curly. I was also worried about my nail polish coming off.⁶⁹

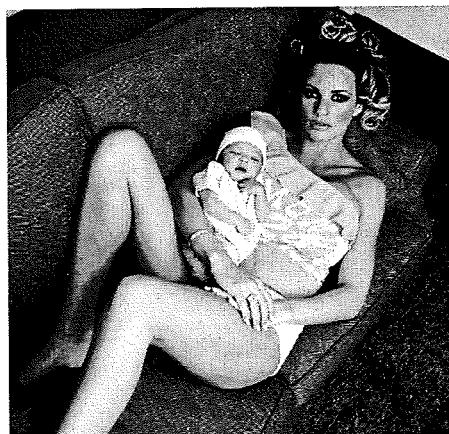
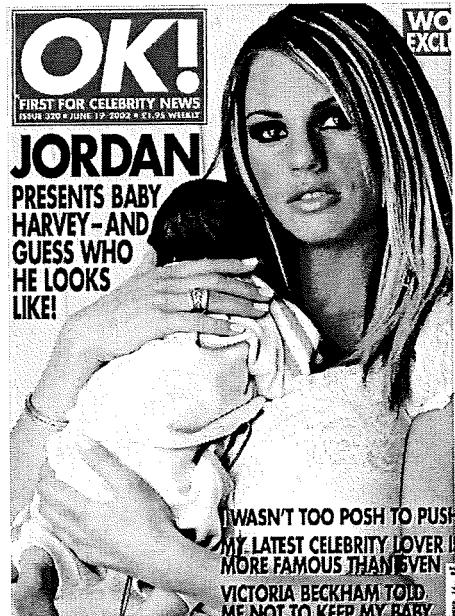
As a role model, she is a powerful force. Her sexually provocative manner is arguably misplaced in these images (Fig 30). Compared to the image of a woman who has just given birth by Rineke Dijkstra, her image expresses a very different persona, yet one that supposedly all these women share, that of the new mother (Fig 31). Despite the sparseness of this image, her contentment exudes from her facial expression, and the position of her arms around the baby inform the viewer of her pre-occupation with protecting her child. She also looks genuinely serene, more so than Jordan. Her sanitary towel and her standard issue maternity pants do not appear to concern her, unlike Jordan's nail varnish or hair. Mandy Smith and Jenny Powell likewise pose apparently happily bottle-feeding their babies.⁷⁰

⁶⁷ *The Guardian Weekend* magazine, (21st Aug 2000)

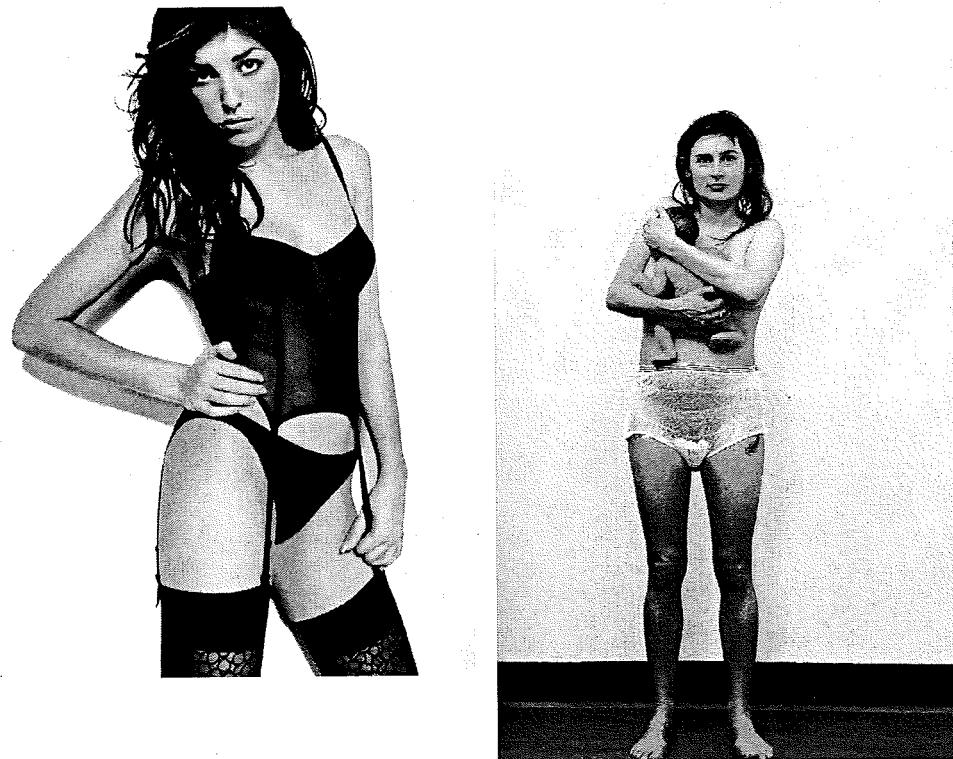
⁶⁸ *OK! Magazine* (19/6/02), p.54

⁶⁹ *Ibid.*, p. 64

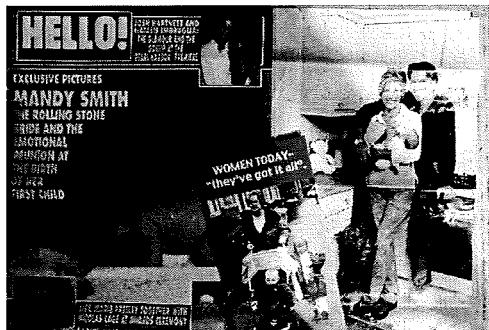
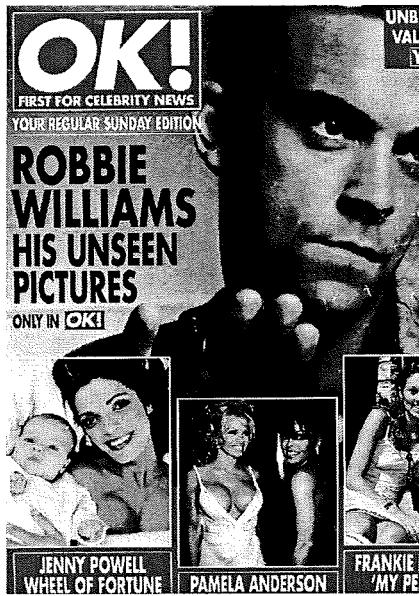
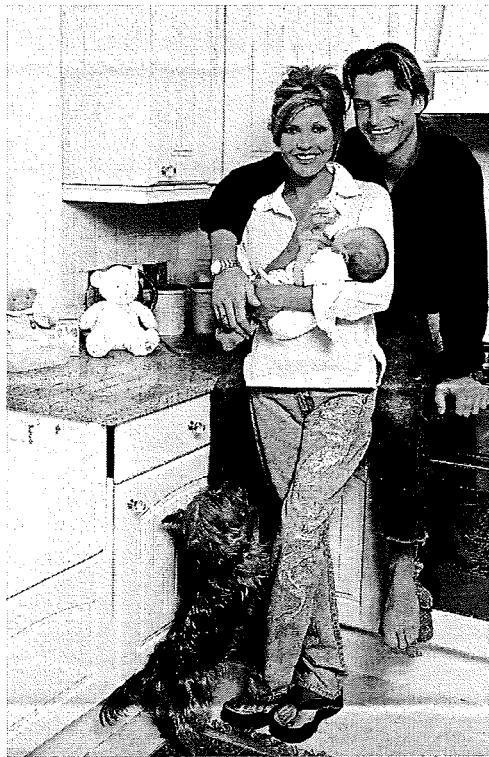
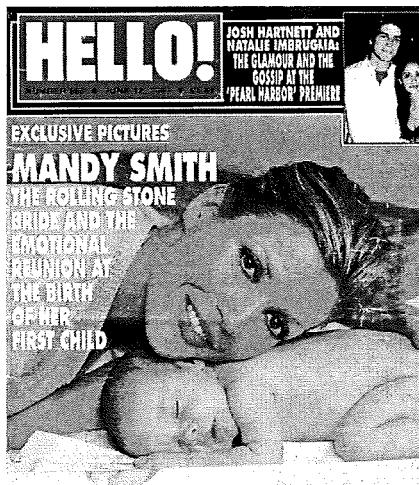
⁷⁰ *Hello! Magazine*, (12/6/01), p.64



30. Jordan in OK! Magazine, 2002. As a role model she is a powerful force. Her gaze is distant and her pose artificial. Her son is ten days old and she bottle-feeds him for the camera.



31. From catwalk fashion to maternity pants overnight. The image of the woman who has just given birth by Rineke Dijkstra, 2000 (right) looks genuinely serene, despite her sanitary towel and her standard issue maternity pants. The image on the left is from the French magazine *Elle*, and shows the stereotypical idealised pre-maternal woman.



32. OK! And Hello! magazines are the two biggest selling celebrity chat magazines in the UK. All the new mothers featured are photographed bottle-feeding their babies at only a few days old: bottle-feeding is the celebrity norm at the turn of the new century. By contrast, the leaflet in the image on the right (bottom) portrays a more accurate scenario for women.

What any teenager sees when she picks up these magazines whilst in the waiting room of the doctor's surgery, for example, are glamorous women making it fashionable to bottle-feed, over and over again. They will aspire to their houses, their partners and their lifestyles. What we do not know is whether any of these women have ever breastfed, or whether any of them have ever really bottle-fed: the pictures, as often in the media could be completely falsifying the situation (Fig 32). Perhaps they breastfeed but were told not to for the photographs? (This is doubtful as the interruption of giving formula milk could damage the mother's ability to breastfeed afterwards). Whatever the reality, the message is clear: bottle-feeding is the celebrity norm at the turn of the new century.

Julie Burchill writing in *The Guardian* on the other hand defends the non-breastfeeding woman. Her controversial article titled *Breastfeeding? It sucks!* offers an ironic and thought provoking explanation as to why women in Britain don't want to be bullied into breastfeeding. She includes a variety of social reasons that are perhaps responsible for working class women's reluctance to breastfeed. In her introduction, comparing Britain's comparatively poor statistics for breastfeeding with those of Scandinavia she explains:

This might have something to do with the fact that Scandinavian women - and men - are universally entitled to humungous maternity and paternity leave. ...In under-unionised and over-Blair'd Britain, lying around the house with your blouse unbuttoned for six months is more liable to get you the sack than a round of applause. And with this government's desire to get young mothers back to work even quicker than usual, a British baby has more chance of recognising *Tinky-Winky* than his own mother's breast.⁷¹

To summarise, her opinion is that the social pressures in this country make working class women at least feel no desire to breastfeed and that that is fine. But the issue is so much more complex: many of these women may of course choose to breastfeed under different circumstances. Burchill's conclusion is a compromise, a compromise that many women painfully feel the need to make in order to keep their own sanity. She summarises:

If feminism is about anything, it is about the fact that what suits one woman may not suit another. Those who do not suit breastfeeding should not be made to feel guilty or failures; this, more than anything, will get their relationship with their babies off to an extremely bad start. To subdue and control women for men was wicked; to do so on behalf of babies is almost as bad. Nipple police, back off!⁷²

Choosing not to breastfeed historically meant a mother would need to seek another lactating woman to feed her child. Nowadays this notion seems weird to us, even dangerous, like receiving someone else's blood, we would only agree to it in life or death situations. To Victorian middle class women though, this was the norm. The next section introduces the wet nurse and explores

⁷¹ Burchill, J, *Breastfeeding? It sucks!* *The Guardian*, p.9, (12/5/99)

⁷² Ibid, p.9



33. The wet nurse is critical figure in the history of breastfeeding over many centuries. In 1780 half or more of all women in the UK were sending their babies to wet nurses. High priced wet nurses sent their own babies to cheaper wet nurses to preserve their own milk supply for professional use.

her role and moreover, it surmises the potential influence she might have had on the phenomenon of the nursing chair

1.2.7 Wet Nursing

The wet nurse is a critical figure that has played a large part in the history of breastfeeding over many centuries (Fig 33). The following section will investigate her role in more depth with a view to suggesting significant implications for the design of furniture for breastfeeding.

Wet nursing is an ancient profession. They were so common at certain times in history that they were subject to competition, having to advertise their services:

Always when the baby cries
We feel our milk returning
Acting with energy and speed
We do our duty.⁷³

This was the jingle in Renaissance Florence where groups of wet nurses gathered at markets to advertise themselves. In 1780 according to Marilyn Yalom in *The History of The Breast* half or more of all women were sending their babies to wet nurses. High priced wet nurses sent their own babies to cheaper wet nurses to preserve their own milk supply for professional use. There is widespread evidence of debate about the issue of wet nursing opposed to and supporting in some cases maternal nursing. Yet it seems not to be a choice like that of 'breast or bottle' is for modern Western women: for the women of pre-industrial Europe their choice was determined always by their economic situation. Likewise, the choice to be a wet nurse in underdeveloped countries or those countries in which there still exists a servant culture, is more often a fete accompli, dependant on the woman's economic status. According to Palmer:

Wet nursing has been commonly viewed in two ways. One was that this was a terrible example of the exploitation of women and it is erroneously assumed that the nurse's baby was often deliberately left to die of neglect so that the woman could sell her milk to survive. The other was that the wet nurse was a drunken slut who neglected or even murdered her charges. Though there are grains of truth in both these stereotypes, the average situation was far less horrifying.⁷⁴

Before the Industrial Revolution a wet nurse was usually a 'respectable married woman'. Resident wet nurses would have had considerable power in the household and were treated very well, usually being given the best food and were not to be upset as people were aware that stress could impede lactation. A wet nurse would be employed for a variety of reasons, but certainly in the case of wealthy women, it was because they were perceived to be too ill and weak to breastfeed:

⁷³ Yalom M, *The History of The Breast*, Harper Collins, (1997), p. 70

⁷⁴ Palmer, G, *The Politics of Breastfeeding*, Pandora, (1993), p.161

The wet nurse was not only paid money and goods such as sugar, tea and candles, but her connection with a wealthy baby could benefit her and her family.⁷⁵

Until the Eighteenth Century, the high culture ideal was still that of the unused bosom, a bosom that was dependant on the wet nurse for its youthful preservation. However, in England campaigns against wet nursing began with an increasing number of people proclaiming that maternal breastfeeding was necessary for the health of the child. There seems to be little evidence of concern about the negative effects of this occupation on the wet nurse's own baby who would also have to be sent to be fed by a cheaper wet nurse. It should be remembered that working class women could earn as much as their husbands (if for example they were labourers) especially if she nursed more than one child, as many wet nurses did.

However, by the end of the Eighteenth Century breastfeeding in England had become fashionable again, being viewed as the only way to ensure that the bad characteristics and physical defects of the wet nurse did not infect her charge. For most of the Nineteenth Century, perhaps influenced by Queen Victoria and Prince Albert, a supreme model of family and civic devotion provided the most influential role model, mothers were encouraged to breastfeed for their general well-being. Increasingly the awareness of psychology at this time and the importance of the physical bond between mother and baby also reinforced the fashion. The practice of sending British babies to the country declined and the wet nurse was increasingly expected to reside in the home of the parents of her charge, under their close supervision. Those mothers who increasingly breastfed were:

...not ashamed to be seen in their homes as they nursed their babies, indeed it was even permissible to breastfeed in such public places as parks and railroads, especially among the popular classes. This was even true for middle class women in rural England where babies were breastfed as a matter of course, for example in church, without the prudery one usually associates with Victorian society.

By the 1880's Louis Pasteur had discovered pasteurising and bottle-feeding began to emerge as an alternative to the wet nurse in England. As mothers moved to cities to find work, we see bottle-feeding eventually emerging as an alternative to breastfeeding at the turn of the century, except for in rural areas where bottle-feeding remained a curiosity until well into the twentieth century (see 1.2.4).

1.3 Conclusion: Chapter 1

This chapter has provided the social and political background to breastfeeding and in so doing the evidence underpins the need to look at furniture that is currently available for breastfeeding women.

From the issues introduced in this chapter it becomes evident that it is the cultural and social barriers to breastfeeding rather than an active decision not to do so, that explains why the statistics

⁷⁵ Ibid, p.161

for breastfeeding introduced in 1.2.1 are so low. Kendall (2001) has argued for example, that aside from the well-documented health benefits of breastfeeding for both a mother and her baby, there are important environmental and economic benefits. She argues that:

- Breastfeeding women are less likely to be absent from work as their children are healthier and the morale of the mothers is better. This, the argument continues, leads to higher productivity.
- Breastfeeding is environmentally friendly leading to only biodegradable waste and as more women breastfeed at work this would have the effect of the workplace becoming a cleaner and safer place to work in.
- The provision of a workplace environment which supports breastfeeding women - by ensuring facilities are comfortable, private and safe for breastfeeding or expressing - would in fact increase the productivity of those women and not as many male dominated employer boards believe, decrease it.

But without educating mothers, fathers, children and employers, any efforts to change the cultural norms will be thwarted by lack of awareness. Public places such as motorway services, public shopping malls and supermarkets all conspire to support a bottle-feeding rather than a breastfeeding culture.

The political influences, most notably that of the aggressive marketing of formula milk, overtly oppress a breastfeeding culture, and whilst evidence of breastfeeding in the media – on television most evidently – is hard to find, it is easy to see that the social culture within which women exist and the wider cultural context of the Western medicalised environment in which women are expected to breastfeed is not breastfeeding friendly. One wonders whether it is even mother friendly.

In terms of design, why design breastfeeding environments and indeed chairs, if no one will use them? There are innumerable examples of initiatives led by women all over the world that indicate that mothers want and need better supportive maternity related structures, especially with regard to breastfeeding support in the workplace. The primary research conducted for this study alone overwhelmingly supports this. Places in which women need to feed their babies, or need to express milk, need to be designed, especially in the industrialised West.

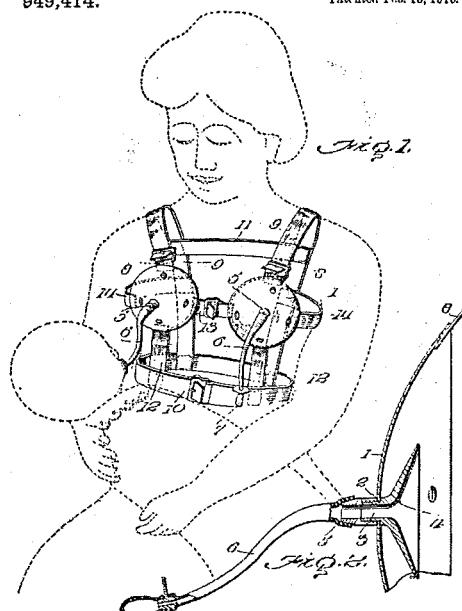
Historically, breastfeeding was, as previously stated, the only way to feed a baby, whether it was done by a mother or by a wet nurse, which begs the question:

Why did Victorian nursing chairs take the form they did: typically deep buttoned and expensively upholstered chairs taking pride of place in middle and upper class homes? (Fig 34 and Fig 36). We know that breastfeeding was then as it is now a taboo subject. The nursing attachment in Fig 35 demonstrates this modesty, so why were so called nursing chairs such expressions of status during this era? The chairs observed in earlier paintings (Fig 37) appear more ordinary and less opulent being probably selected by women for their low height and upright backrests. By comparison, these Victorian chairs were comparatively luxurious.

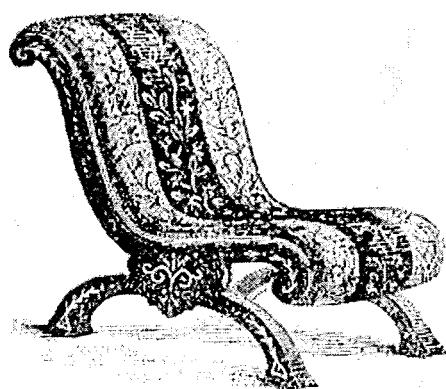


34. A typically low, deep buttoned and expensively upholstered nursing chair from about 1850.

NURSING ATTACHMENT.
APPLICATION FILED SEPT. 7, 1908.
949,414. Patented Feb. 15, 1910.

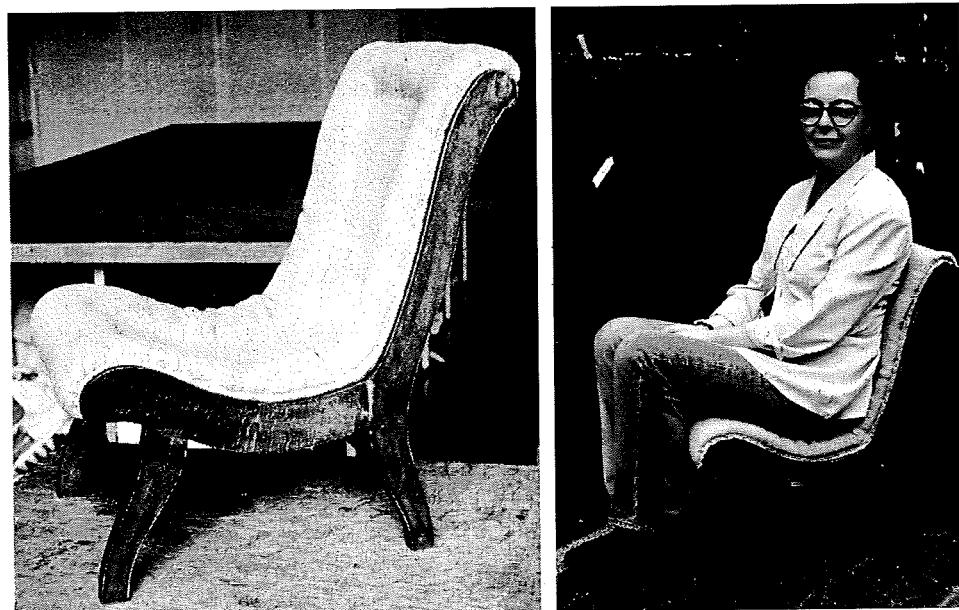


35. The taboo that was breastfeeding is highlighted by this patent application for a nursing attachment for modern mothers, 1910.



Lady's Easy Chair—
Ebonized and gold, in plush
velvet . . . £1 11 6
A variety of similar styles, and in
various materials, from 16s. 6d. to
4 Guineas.

36. The way chairs were named indicates a shying
away from, or reluctance to admit to their intended use.



A nursing chair (or slipper chair) being restored for a new mother to breastfeed in, 2002.
The small scale of this chair is typical of Victorian nursing chairs.



37. From paintings we can see that the chairs women sat on to breastfeed in were low in height. The mother in this Renoir painting (bottom) is breastfeeding outdoors, not hiding her breast. Her chair appears to be made of wicker and she leans forward, suggesting a problem with the angle of the backrest. However, she is smiling and looks relaxed and confident.

It could be hypothesised from the evidence we have explored in this chapter therefore that:

- A nursing chair was intended for the nurse who nursed in the home and who in most cases during the Nineteenth Century was not actually the mother. Therefore in purchasing the chair, or by commissioning one to be made, the family were *exhibiting* a piece of furniture (as was the case with many other pieces of that period), as a statement about their financial standing, that is, how expensive a nurse they could employ, rather than the chair having anything at all to do with any real consideration of the nurse's comfort or ergonomic satisfaction.
- Such chairs were token gestures, symbolic of some domestic ideal or status.
- Nursing chairs were not designed for breastfeeding, possibly explaining why although we are sometimes given the chair maker's name, design evidence is difficult determine.
- The way these chairs were named, perhaps indicates a deliberate shying away from, or reluctance to admit to, their intention for use with names like *ladies chair* or *fireside chair* being attached to chairs we might now assume to be nursing chairs, particularly during the Nineteenth Century (Fig 36).
- Prior to this, what did nursing chairs look like? Did they even exist? From paintings we can see that the chairs women sat on to breastfeed were usually low in height, but this could be because people were shorter in stature (Fig 37).

These speculations with regard to design are further discussed and illustrated in Section B.

The comfort, pleasure, physiological and psychological function of breastfeeding is now illustrated in Chapter 2, with the intention of informing Section B.

2. Psychology, Anatomy and Physiology

Introduction

Much of the psychological material written about a mother's first meeting with her baby assumes the woman to be a machine programmed to respond 'correctly', and when that response falters, there exists a fault in the machine or the software: the woman. Publications like *Successful Breastfeeding*, produced by *The Royal College of Midwives* are currently used to encourage breastfeeding in Great Britain. Principal members of the working group who produced the first edition, include Chloe Fisher and Sally Inch, both currently working in *The Infant Feeding Centre of The Women's Centre at The John Radcliffe Hospital* In Oxford, In their publications on breastfeeding they quite specifically recognise psychological issues to be imperative to successful or unsuccessful breastfeeding experiences:

The psychological impact on the mother of her first breastfeeding experience is of undoubted importance. A woman who has just given birth will attach great significance to the way her baby reacts to her and this may affect her feelings towards her baby.....The psychological component of successful breastfeeding should not be underestimated.¹

In terms of the design of a chair for breastfeeding, it is evident that environmental factors will psychologically affect relaxation, stress and anxiety, and that physiologically there is a very close relationship between the two aspects. Breastfeeding is therefore discussed in this chapter in order to inform designers primarily of issues that need to be considered before attempting to design a breastfeeding chair.

2.1 Psychological Considerations Relevant to the Design Process

Psychologically, chairs and being seated have become a symbol of Westernisation. Chair imagery, association and meaning cannot be related to anatomy and physiology alone. Examples of psychological chair association, or where the metaphor of a chair is used are:

- University professors hold 'chairs'
- Departments universally have chairmen, chairwomen or chairpersons
- Counties have seats
- Politicians hold seats
- There are seats on the stock exchange
- A hot seat is most likely to be a chair
- In Christian religious communities an empty chair represents Christ
- A throne has a different meaning to a chair, yet it is still a seat

¹ Royal College of Midwives, *Successful Breastfeeding*, Longman, (1991), p.26

The above are metaphors for position, social role, and power. Psychological perceptions of the chair can prove to be almost stronger than the physical fabric of the chair itself.

...both beauty and comfort are mixed up with status. The chair a person sits in often reveals his or her social status, which then takes priority over beauty or comfort. The chair comes to represent a role...²

Psychologically orientated architects have spent lifetimes perfecting a fusion between the physiological and the psychological. For example, Bianca Lepori an architect based in Rome, designs birth environments for hospitals. Based on psychological and physiological observations of home births, she has designed rooms with an empty centre to allow for the spiral path women follow during labour.³ She designs the space in response to the movements women make during labour rather than imposing an expectation that the woman will lie down on a bed. Floor cushions and perhaps a birth stool are the only pieces of furniture present. There is a pool and soft indirect lighting. She has observed that when women use the spaces she has designed they often give birth in a secluded corner of the room. Likewise Dr. Michel Odent the French birth philosopher, surgeon-turned-midwife and now *Director of Research at The Primal Health Research Centre* in London, has set up birthing centres in France and England where women are encouraged to refer to the behaviour of other mammals in order to rediscover their own primitive behaviour. He believes that solitary birth is the ideal as was typical of pre-agricultural societies. Void of medical equipment, bits of machinery, intermittent beeping and flashing lights, he too believes that she will be less afraid, and will be happy to find a small corner, preferably where the light has been dimmed, in which to give birth⁴ (Fig 1). In an essay on breastfeeding, he summarises:

To give birth to her baby, the mother needs privacy. She needs to feel unobserved. The newborn baby needs the skin of the mother, her breast. These are all needs that we hold in common with other mammals, but that humans have learned to neglect, to ignore or even deny.⁵

2.1.1 Kitzinger's Approach

Sheila Kitzinger is a passionate advocate of the non-medicalisation of breastfeeding and childbirth. She is a social anthropologist who has devoted her life to the study of childbirth and breastfeeding. To date her best known works *The Experience of Childbirth*, *The Experience of Breastfeeding*, *Women's Experience of Sex* and her latest book *Rediscovering Birth*, explore her universal experience of the subject and deal with the psychology of breastfeeding in an empathetic, articulate, realistic and appropriate way. Although not medically trained, she has a formidable reputation among those in the medical profession. For over forty years she has maintained that when birth and breastfeeding are reduced to a medical process, the experience is diminished and the mother disrespected. Devoid of authoritarian pronouncements or advice her aim is to enable

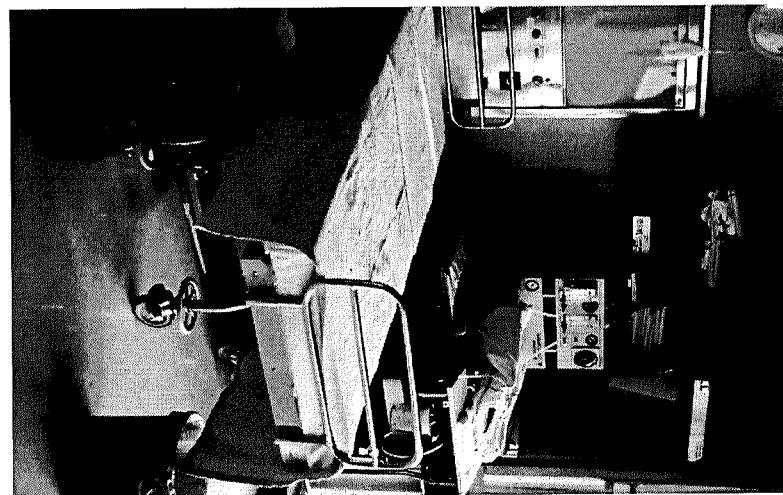
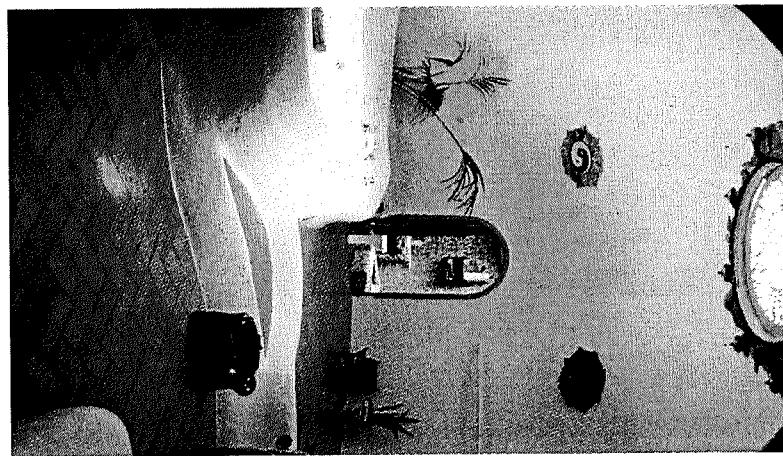
² Crantz, G, *The Chair -Rethinking Culture, Body & Design*, Norton, (2000), p.16

³ Crantz, G, *The Chair-Rethinking Culture, Body & Design*, (2000), Norton, p.202

⁴ Odent, M, *The Nature of Birth and Breastfeeding*, Bergin & Garvey, (1992), p. 16

⁵ Ibid, p. 129

1.
Bianca Lepori's birthroom compared with a typical
birthroom in the UK in 2001.



women and their partners to make informed choices. She also believes that a consequence of the attitude to the teaching of breastfeeding in some of the many 'self help' books now available, can lead to the mother treating her baby in a mechanistic way:

It starts with the way the mother feeds her baby. I do not mean by this only the difference between breast and bottle, but the mood in which she feeds. Some mothers relax, forget time and enjoy talking to and watching the baby during feeds. Others are tense, watch the clock, and treat the baby a bit like a car which has to be filled with petrol, jiggling it up and down when it stops for a few seconds.⁶

Interviewed at her home in Standlake in Oxfordshire in November 2001, Kitzinger stressed the importance of the psychological considerations when breastfeeding in addition to the more practical aspects. For example, she felt that familiarity with furniture and what she refers to as props, should not be underestimated. Furniture should not feel alien to the mother, therefore designing it to allow it to not be limited only to the breastfeeding period she believes to be a good idea. She gave the example of a birth stool, which she uses in her house as a coffee table:

It would just end up getting in the way if it didn't serve another function. I love it being our coffee table because it holds such nostalgic memories for me, and is still very useful. Oral history is so very important, yet people don't realise just how important.

Telling stories to your daughters about the furniture will help dispel fear and anxiety: the passing down the family of Victorian nursing chairs succeeded in this respect I think.⁷

Kitzinger cites the Peter Opsvik *Tripp-Trapp* high chair as a good example of this, a chair which, as it grows with the child, grows in familiarity with the family too, as it is passed down from sibling to sibling. Its primary function, that of ensuring that the infant is at the correct position at the eating table, is secondary to the role it plays in the family home (Fig 2). Likewise she felt that a breastfeeding chair, as did Victorian nursing chairs, could enjoy a similar significant role.

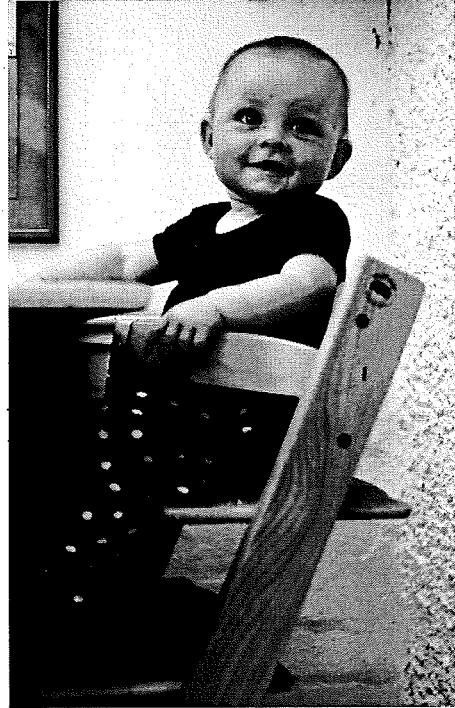
Advice of a psychological nature is not short for new mothers and the implications of it as it affects the behaviour of the mother, will inevitably have an effect on the need for and the design of furniture: Kitzinger's approach to familiarity and longevity will have a direct effect on the design criteria for a breastfeeding chair. Her sensitivities are shared by many: *What to Expect The First Year; Pregnancy*, and various Miriam Stoppard publications are currently popular titles advocating the importance of psychological well-being during breastfeeding:

Relax for several minutes before beginning (breastfeeding). Use meditation or other relaxation techniques, music, TV, or whatever you personally find helps you unwind....⁸

⁶ Kitzinger, S, interview with author, 22/11/01

⁷ Kitzinger, S, interview with author, 22/11/01

⁸ Eisenberg, Murkoff & Hathaway. *What To Expect The First Year*, Simon & Schuster, (1989) p.92



2. Kitzinger usefully compares Peter Opsvik's *Tripp-Trapp* chair to a breastfeeding chair or a birthing stool to illustrate the role such chairs ought to have in the family home

The psychological preparation, as we see later in the discussion about physiology, does evidently affect the mother's ability to produce milk. Research has shown that the let-down reflex is found to be affected by environmental factors (2.2.3).

2.1.2 Historical Perspective

Historically, Sigmund Freud's well-documented attitude to breasts and breastfeeding emerges at the turn of the Twentieth Century. Psychoanalytically (a term which he invented in the 1890's⁹), breasts allegedly are the source of our deepest emotions. Freud stated that sucking at the breast was not only the child's first activity, but it was also "the starting point of the whole of sexual life".¹⁰ His theories today however are received with some scepticism. Famously, one theory concludes with the idea that girls and boys do not renounce the mother's breast in the same way. He theorises that a boy is searching for substitute breasts and a girl confirms his well documented penis envy theory, that she substitutes the penis for the original object, the nipple, therefore suggesting why men and women might be interested in breasts for different psychological reasons. The maternal breast and the erotic breast, the practical and the emotional, become one once again.

In the 1920's, Doctor Truby King, a zealous New Zealander and a stickler for rigid routines promoted his scientific theory of infant feeding based on one he had developed for dairy calves. It was a method that proved to undermine women's confidence in breastfeeding, leaving mothers psychologically feeling inadequate and guilty.¹¹

He invented rules with eugenic and moral overtones about how babies should be fed, having their sucking time strictly rationed. What women all over the world had practised successfully became damaging, according to his propaganda:

The waking of a baby to take food, at any time between midnight and sunrise, is unnatural.
Any baby can be easily spoiled and made a cross, fretful, exacting little tyrant.¹²

Cutting out nighttime feeds, proven to reduce natural contraceptive effect often created more difficulties for the mother.

It is likely that the warnings that people have showered on new mothers during the last century could have stemmed from advice such as this. By contrast, Sheila Kitzinger states:

Communication between mother and baby during the time when lactation is getting established is very important, and feed times should relate to the baby's crying rather than to the clock.¹³

⁹ Gilbert, H, *The Sexual Imagination*, Random House, (1993), p.93

¹⁰ Freud, S, *The Complete Works of Sigmund Freud*, p. from Yalom M, *The History of The Breast*, Harper Collins, (1997) p.145

¹¹ King, T, *The Natural Feeding of Infants*, cited by Yalom M, *A History of the Breast*, Harper Collins, (1997) p.91

¹² Ibid, p.92

The importance of this to the designer cannot be underestimated. Truby King's attitude to the restriction of suckling time, for example, invariably will have an effect on the need for designers to be aware of pressure points when sitting for long periods of time. Using furniture to feed during the night will require a different set of design criteria to that required of furniture for daytime feeding or outdoor feeding and so on (3.2.7).

The evolving feminist movement throughout this century has echoed or even dictated fashionable thought. Perhaps the Naomi Wolf or Germaine Greer of 1949 was Simone de Beauvoir. In her book *The Second Sex*, she puts forward a controversial, less idealistic view of what she sees the reality of breastfeeding to be:

Even nursing affords such a woman no pleasure; on the contrary, she is apprehensive of ruining her bosom; she resents feeling her nipples cracked, the glands painful; sucking the baby hurts; the infant seems to her to be sucking out her strength, her life, her happiness. It inflicts a harsh slavery upon her and it is no longer a part of her: it seems a tyrant; she feels hostile to this little stranger, this individual who menaces her flesh, her freedom, her whole ego.¹⁴

It is interesting to note how similar her language is to that of Truby King, using terminology like 'little tyrant' in much the same way as he did, showing how early feminism supported the idea that women were 'trapped' by their nature rather than driven by it in a positive way.

Positive self-esteem is difficult to quantify or measure but it would seem from this relatively recent account that de Beauvoir assumes the activity of breastfeeding will only diminish her self-esteem. It is debatable whether the experience of breastfeeding going wrong early on contributes to this kind of downward spiral effect upon the emotions as breastfeeding is established, or whether other pressures in society make women believe that this will be the way that they should expect to feel (Self-esteem is cited later in 3.2 Case Studies, as an important factor today (2002) in the UK in terms of its influence on breastfeeding rates).

On the contrary, Yalom quotes Ambroise Pare's description in the Sixteenth Century of the physical and emotional pleasures a mother could derive from breastfeeding:

There is a sympathetic connection between breasts and the womb: as the breast is tickled, the womb is aroused and feels pleasurable titillation.¹⁵

The psychological pleasure of breastfeeding described here could of course be determined by physiology. Psychologists, Freud being an obvious example, tend to focus on the feelings of the infant and the effects of breastfeeding on sexuality in particular, in later life. The psychological

¹³ Kitzinger, S, *Ourselves as Mothers*, Doubleday, (1992), p.31

¹⁴ De Beauvoir, S, *The Second Sex*, Penguin Books, (1949), p.524

¹⁵ Pare, A, cited By Yalom M, *A History of The Breast*, Harper Collins, (1997), p.71

pleasure of breastfeeding from the mother's viewpoint may provide some clues that could be judged to have some influence on breastfeeding rates.

2.1.3 The Psychological Pleasure of Breastfeeding

It is difficult to ascertain or measure just to what extent psychology in terms of pleasure afforded by women breastfeeding affects 'successful' outcomes. The phenomenon of pleasure is rarely discussed. Debating the issue in her most recent book, *The Whole Woman*, Greer investigates male as opposed to female attitudes, and although she often has a tendency to berate men in her texts, she uses this to effectively emphasise the point:

No research has ever been done on breast centred eroticism in bottle-fed as opposed to breastfed individuals. No sub-group of fetishists is turned on by bottle shaped breasts, as far as we know. Women are at least as concerned about breasts and interested in breasts as men are. No attempt has ever been made to discover why women are so attached to their breasts, or why they consider the breast the defining sexual characteristic of the female. If it is hard to explain grown men's fascination with tits, jugs, boobs, norks, bazookas, bazooms, knockers, bristols, paps, dugs, titties, bubbles, etc., and their readiness to slobber them and suck them like giant stubby babies, women's attitudes to men's caressing their breasts are no less mysterious. Some women derive intense pleasure from it, others less, and some none at all.¹⁶

Kate Figes in her book *Life after Birth* shares with Greer the idea that perhaps links between adult sexuality and breastfeeding have always been romanticised by men who find it hard to see a child suckling in non-sexual terms. She quotes Balzac to illustrate her point:

When they (babies) fasten there they cause both pain and pleasure – pleasure which stretches into pain, pain which ends in pleasure. I cannot explain to you the sensation that radiates from my bosom to the source of life: it seems that a thousand rays start from that centre to fill my heart and soul with joy....¹⁷

As her discussion continues, she likens quotes to descriptions of orgasm rather than breastfeeding (which she believes to happen much more, incidentally, when the writer is male), and warns of the confusion:

The myth that some women experience orgasm during breastfeeding is pernicious and frightening for women because of the connotations of incest. There are physiological similarities - the stimulation of the nipple causes the release of the hormone oxytocin which has mood enhancing and relaxing qualities and causes the uterus to contract. But that is all

¹⁶ Greer, G *The Whole Woman*, Transworld Publishers, (2000), p.59

¹⁷ Balzac, *Memoirs of Two Young Married Women*, from Life After Birth, Kate Figes (1998), p.69

it is, a contraction, not an orgasm....Healthy relationships with children are sensual, not sexual.¹⁸

Again on the contrary, Alicia Ostriker was one of the first to write openly in her poetry about the fact that mothers *can* become sexually aroused by suckling:

Greedy baby
suckling the sweet tit
your tongue tugging the nipple tickles your mama
your round eyes open appear to possess understanding
when you suckle I am slowly moved
in my sensitive groove
you in your mouth are alive, I in my womb.¹⁹

It is quite clear that attitudes as to whether or not breastfeeding has sexual meaning to women are ambiguous. Freud would say that the answers are to be found in the unconscious mind, therefore suggesting that asking people simply how they feel will not give an accurate picture. Ostriker's poetry on the other hand, expresses a personal and therefore equally accurate picture for her. Greer and Figes meanwhile reflect on accusations of pressure from men.

Few take literally Freud's sacrosanct belief that "the child never gets over the pain of losing its mother's breast." Nor do we call a mother unable to breast feed a pathological "hysteric" and treat her with sessions of hypnosis, as Freud did in one memorable case. Though we are sensitive to the many unconscious determinants involved in a person's life choices, we are no longer bound by dogmatic, flimsily founded interpretations masquerading as science. Sometimes a breast is just a breast.²⁰

So are the sexual connotations of breastfeeding being covertly repressed by men or by women and for what reasons? Jane Ussher in her feminist essay *The Masculine Gaze*, suggests that it is an envy that is being repressed by men, that of woman's reproductive power:

From the biological point of view woman has in motherhood, or in the capacity for motherhood, a quite indisputable and by no means negligible biological superiority. This is most clearly reflected in the unconscious of the male psyche in the boy's intense envy of motherhood, of pregnancy, childbirth....as well as of the breasts and of the act of suckling.²¹

Evidence from case studies collated for this thesis suggests that the pleasurable of breastfeeding and the theories about it and explanations for it varies from woman to woman and there is

¹⁸ Figes, K, *Life After Birth*, Penguin Books, (1998), p.194

¹⁹ Ostriker, A, *The Mother/Child Papers*, p.18, cited by Yalom, M, *A History of the Breast*, Harper Collins, (1997), p. 254

²⁰ Yalom, M, *The History of The Breast*, Harper Collins, (1997), p.158

²¹ Ussher, JM, *Fantasies of Femininity*, Penguin Books, (1997), p.111

seemingly only one common thread: that when it is going very well it can be intensely fulfilling. Whether or not this translates to orgasmic intensity remains too subjective to quantify.

Perhaps if we return to Freudian breast theories he frequently referred to the physiological effecting the psychological in the same way. Galen Crantz in her controversial cultural appraisal *The Chair* refuses to extricate the two:

Even if we succeed in changing the way we think about ourselves, and learn new habits of mind and body, the physical environment will not change automatically, of course. The professional designers who design products, interiors, buildings, and cities must be enlisted to translate new ways of living into new forms. Consumers too, are designers of sorts who make, buy, or otherwise obtain and then assemble products in our everyday environments. They too will seek ways to translate sensual rationality....Body-conscious design is synonymous with sensuous rationality. Reason and sensation, cognition and perception, are often set up as opposites, but an underlying theme of this book is that it is reasonable to honour both: our sensual wisdom. On its own, rationality runs amok. Freud worried that modern man had become a prosthesis god - powerful, mechanised, and artificial through the use of painful, ill-fitting prosthetic devices such as buildings and chairs. I assume that we can improve the environment through reason informed by our senses.²²

However it is perceived, psychological well-being is evidently related to physiological well-being and comfort when breastfeeding which will certainly have an impact on the design process when designing a breastfeeding chair. Attitudes to breasts, breastfeeding and to women assist in forming women's own psychological health, which in turn could affect her confidence to breastfeed, or to continue to breastfeed. Psychologically, the impact on the mother of her early breastfeeding experiences is undoubtedly crucial to her decision to continue with this method of feeding and is inextricably linked to physiology. The kind of psychological hypocrisy commonplace in the UK today that continues to deter women from breastfeeding, to lose confidence, and to ultimately negate the requirement for a breastfeeding chair at all is epitomised here by Germaine Greer:

Display of their breasts by topless waitresses earns them better tips; bouncing one's breasts in the face of a complete stranger is a fun way of making a living as a lap-dancer but breastfeeding is considered obscene. Every week British newspapers carry stories of women moved on from park benches and seats in malls and department stores and thrown out of public meetings because they dared to give their infant the breast.²³

The partner of one of the case studies for the research for this project vehemently argues that breastfeeding women should not want to feel beautiful, sexy or glamorous: 'They shouldn't worry about it. Her function at that time is to feed the baby. It has nothing to do with sex.' His partner is an avid breastfeeder and when asked how he perceived her when she fed he admitted to not relating the activity of breastfeeding to his sexual attraction to her at all. In fact he understood why she

²² Crantz, G, *The Chair*, Norton, (2000), p. 189

²³ Greer, G, *The Whole Woman*, Transworld Publishers, (2000), p.61

might feel the need to leave the room to feed (which she did not) and argued that men should not be put in the embarrassing situation that is watching a mother breastfeed. Other partners have argued the opposite: that their partners are most beautiful when feeding their child, and should be encouraged to feel so.

The cult of the breast as a sex object has undoubtedly helped speed the decline of breastfeeding. The conical breast of the 1950's and 1960's seemed to be there solely to attract men... Perhaps the more recent trend towards more self confidence and towards natural living, with many young women doing without tight bras and make-up and relying more on their unborn femininity to attract men will encompass and encourage breastfeeding too.²⁴

Psychologically, the perception of her breasts as an intrinsic part of the sensuality and sexuality of breastfeeding applies whatever the responses and opinions of her partner. Worrying myths about what constitutes a healthy breast also damage women's confidence psychologically:

A healthy breast may not be a sexy breast; a breast is healthier if it has lactated before the age of thirty or so, and it is healthier the longer it has lactated. Lactation causes breasts to discolour, the nipples to grow dark, and after lactation the breast is often slack and empty looking. Contrariwise, a reconstructed breast is seldom a healthy breast.²⁵

Women must feel confident in themselves and their bodies before they can happily breastfeed and whilst such mixed messages continue to be portrayed no amount of physiological ability will be sufficient to maintain breastfeeding alone.

2.1.4 The Psychology of Attachment

Firstly, it is important to distinguish between the emotional attachment of the child to the mother and the physical attachment of the child to the breast. Even between psychoanalysts, the boundaries become confused. What does seem common is that an early physical attachment to the breast is perceived to evolve into an emotional attachment or bond to the mother. Physical attachment, or latching on is described and discussed later, 2.2.4. Further, Freud takes the bonding process forward to the development of the child's relationship with the father:

A woman's strong dependence on her father merely takes over the heritage of an equally strong attachment to her mother, and that this earlier phase has lasted for an unexpectedly long period of time. Everything in the sphere of this first attachment to the mother seemed to me so difficult to grasp in analysis.²⁶

²⁴ Stanway, Drs. P&A, *Breast is Best*, Pan Books (1978), p.135

²⁵ Greer, G, *The Whole Woman*, Transworld Publishers, (2000), p.62

²⁶ Freud, S, (1931) cited by Bowlby J, Pimlico, (1969), p.177

John Bowlby, with whom many psychoanalysts to this day hold fast, clearly believes that attachment to the breast provides much of the grounding of the emotional attachment that can be observed through the development of the child, and then on into its adult life.

Introducing his four principal theories of attachment, Primary Object Sucking and Primary Object Clinging are described as contributing to attachment as follows:

There is in infants an in built propensity to relate themselves to a human breast, to suck it and to possess it orally. In due course the infant learns that, attached to the breast, there is a mother and so relates to her also. I propose to term this the theory of Primary Object Sucking. There is in infants an in built propensity to be in touch with and to cling to a human being. In this sense there is a need for an object independent of food which is as primary as the 'need' for food and warmth. It is proposed to term this the theory of Primary Object Clinging.²⁷

Bowlby's theories are long and complex, including fascinating observations of attachment behaviour in monkeys, birds, cows, sheep and so on. For the purposes of this thesis, it is understood that attachment behaviour is regarded by Bowlby as a class of social behaviour of an importance equivalent to that of mating behaviour and of parental behaviour. Bearing this in mind, any material construct separating a baby from its mother, must be introduced at an emotionally 'right' time. It can be concluded from Bowlby's ideas that a breastfeeding chair can only encourage and support the healthy attachment of a baby to its mother as it encourages both Primary Object Clinging and Primary Object Sucking. Interestingly, skin to skin contact, as advocated by UNICEF and consequently other advocates of breastfeeding is another interpretation of Primary Object Clinging.

The psychology of attachment is now more commonly referred to as 'bonding' has become the fashionable theory central to most self help books about breastfeeding. Sheila Kitzinger puts it quite aptly:

Some research papers treat bonding as if it were a magic glue that sticks mother and baby together, regardless of the environment and regardless of the kind of care that is given to a mother.²⁸

Psychologically, this is a powerful notion, the idea that bonding should quite naturally happen, that a mother will, irrespective of the environment or the kind of care she receives during and following childbirth, bond at the first sight of her baby. It would appear that there is an enormous difference between the first days of life in many developing countries and those observed in many modern maternity hospitals in the west.

In many cultures a rite or tradition of giving food or gifts to the new baby continues a bonding process that began at a much earlier stage when the baby was growing inside the mother's womb.

²⁷ Bowlby, J, *Attachment & Loss*, Pimlico, (1969), p.47

²⁸ Kitzinger, S, *Rediscovering Birth*, Little, Brown & Co., (2000), p.235

In the west, technology dominates this process. Early scans of the foetus and excited sightings of it for the first time in hospital can distract the mother from a more psychological awareness of her baby inside her. Following birth, breastfeeding is the next stage in the bonding process. If her baby is taken away from her on delivery, as is still surprisingly the norm in many hospitals in the UK, she may feel deprived of the most valuable bonding opportunity to her, so reducing her confidence in feeding and increasing her dependency on hospital carers. Inhibiting the opportunity for the expression of emotions, flesh to flesh contact and the spontaneous exploration of their new babies is only exacerbated by the furniture surrounding the new mother (Fig 3). Beds are too high and too narrow for both mother and baby. A plastic (transparent acrylic) box on a trolley is placed beside the mother's bed, which is difficult to get to and aggravates the separation of the mother and her baby (Fig 4) (the first memorable sight of my daughter was through the side of one of these boxes) (3.4.6).

The psychological importance of all of these factors contributes to the mother's ability to enjoy a happy relationship with her baby. Attachment to the breast (2.2.3) therefore needs to be uninhibited and not made more difficult by the furniture and processes imposed on her by the hospital:

In a technocratic culture, the six weeks after childbirth are treated as a time for medical processing and for speedy social adjustment....it is hardly surprising that new mothers often lack confidence when breastfeeding. Far from being the natural way in which to nurture a baby, producing enough milk and getting it into the baby seems like a complicated conjuring trick which they must practise over and over again, but cannot get right. This is why many women turn to artificial feeding with relief. In traditional cultures mothers work with their babies cuddled against their bodies. They are rocked, bounced, and often shaken energetically by the movements as they dig and hoe, pound millet, knead bread, scour pots, rub the laundry on stones in the river, or break up rocks to build a road....as soon as the baby stirs, he is fed.²⁹

Bonding and easy attachment with her baby is therefore overtly obstructed in a society that doesn't tolerate babies on the whole unless they are sleeping. Furniture is a major obstruction and could be designed to more sensitively reflect the needs of the mother and baby during the early stages of their intimacy together.

The physiology of lactation will now be outlined in order to further understand the psychology of lactation and consequently the issues affecting the ergonomic constraints on women when breastfeeding, the details of which follow in Chapter 3.

2.2 The Physiological Considerations Impacting on the Ergonomic Constraints of Designing a Breastfeeding Chair.

2.2.1 Breast Milk

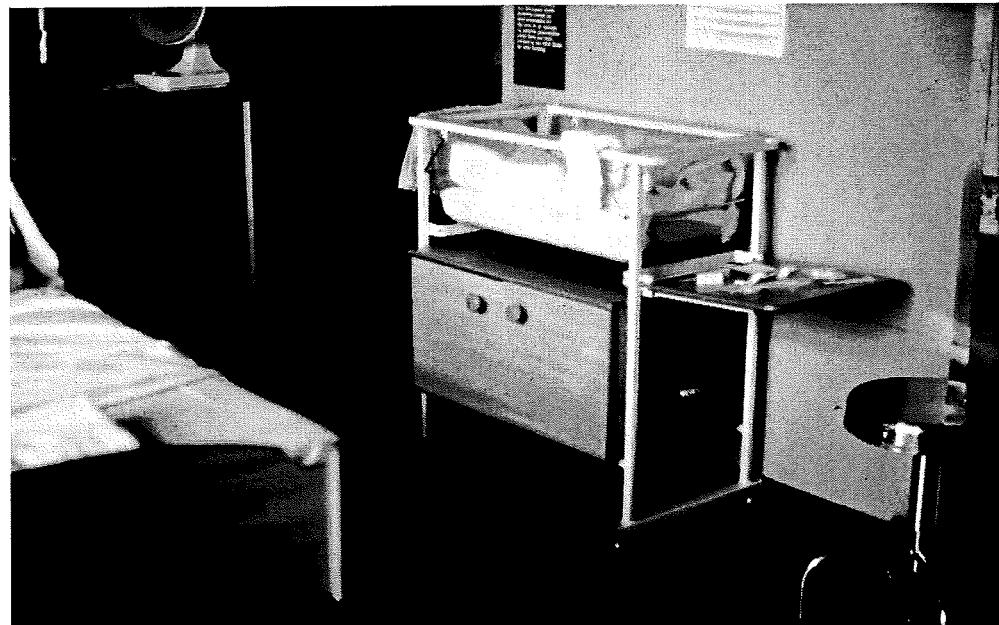
²⁹ Ibid, p.203



3. This chair is used to take women who are in labour to the ward
2002, Gloucestershire Royal Hospital.



Furniture typically surrounding a new mother, Stockport Maternity Hospital, 2001.



4. The first sight most mothers have of their baby is through the side of one of these clear acrylic cots. There has been an attempt to domesticate the room by screwing a pine baseboard from a domestic bed to a hospital bed.

The image of the Madonna is one of the most prevalent images in Western art. In Renaissance Italy she was known as Madonna del Latte, the 'of milk' suffix having long since evolved out of her title. She suckled the baby Jesus. As a sacred fluid, the milk of The Virgin Mary ranked similarly to the blood that flowed from Christ's wounds on the cross.

She felt no pain in childbirth, she kept her virginity and presumably her hymen throughout her life..she did not menstruate, defecate or urinate...she defied anatomy, biochemistry and the laws of thermodynamics....but she did use her mammary glands...³⁰

Madonna's milk though was not the first milk to be exalted. The milk of a Greek goddess was said to promise infinite life to those who drank it. In the painting *The Origin of The Milky Way* by Tintoretto in 1550, Zeus, seeking divinity for his son Hercules, born of an adulterous affair with Alcmene, sneaks the infant into the bedroom of his sleeping wife, Hera. He suckles so hard so the story goes, that Hera awoke, shook him off in outrage spouting milk across the sky, hence the origins of the Milky Way (Fig 5). Human milk has also been recommended as a treatment for many ailments such as cataracts, burns and eczema, and has been accorded magical status throughout history. Unlike menstrual blood, it is deemed pure and unpolluting.³¹

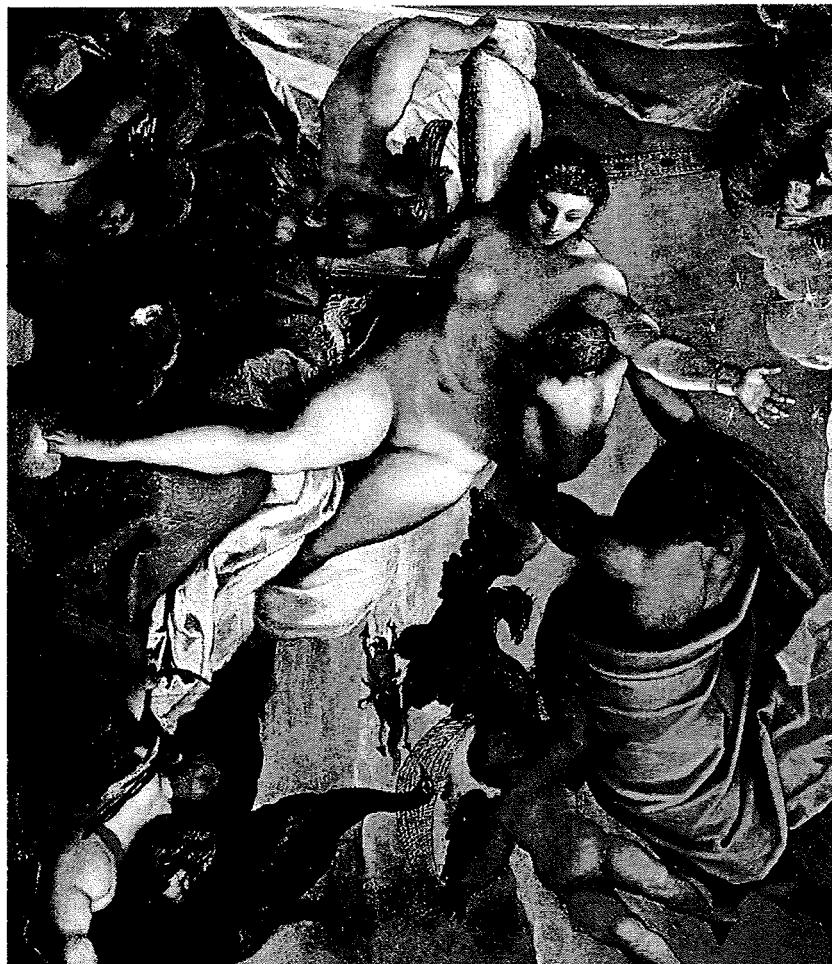
By definition milk is the product of the mammary gland but is chemically more complex than many other secretions of the body, and has been subject to considerable analysis. It is made up of more than two hundred constituents whose many roles have yet to be fully understood.

The liquid part of milk, which makes up its main bulk is water. All the other constituents are either dissolved or suspended in this water making the breast milk appear white, creamy, translucent or yellow. As the list of constituents is so exhaustive, summarised below are those with which the reader might be most familiar:

- Water
- Proteins (1.2%)
- Amino Acids
- Nucleotides – encourage the growth of bowel bacteria
- Fats (between 2.6% and 4.5%) providing more than 50% of a baby's energy
- Carbohydrates (84 – 95% of those present in breast milk are lactose, others are glucose, galactose and oligosaccharides)
- Minerals – sodium, calcium, magnesium, phosphorous, iron (twice as much in breast milk than cow's milk)
- Fluoride
- Trace Elements – copper, zinc, manganese, selenium, iodine, chromium, cobalt, silicone and boron
- Vitamins A,C,D and K

³⁰ Angier, N, *Woman* London, Virago Press, (1999), p.144

³¹ Ibid, p. 145



5. The Origin of the Milky Way by Tintoretto, 1550.

Tintoretto portrays the Milky Way being created from a jet of milk. It was believed that mortals could become immortal if they suckled at the breast of the queen of the goddesses. So, when Zeus wanted his son Hercules, whose mother was the mortal Alcmena, to have immortality, he had him placed quietly at Hera's breast while she was sleeping. Hercules, however suckled so vigorously that she awoke, realising he was not her own child. On this she drew her breast away with such force that the milk spurted into the heavens and created the Milky Way. Hercules, having drunk Hera's milk thus became immortal and one of the gods.

- Anti-infective factors – micro-organisms, gynolactose, lactoferrin (colostrum, the earliest milk made in the first few days after delivery is unusually rich in this anti-infective, iron-binding, whey protein), immunoglobulins
- Lactoperoxidase – an enzyme inhibiting the growth of bacteria
- Hormones – insulin, prolactin, corticosteroids, relaxin, oestrogens, progesterone, gonadotropins, thyroid hormones
- Prostaglandins
- Growth factors
- Enzymes (over seventy now named)
- Foods, drugs and environmental contaminants

From this abbreviated list it is clear to see why breast milk has historically been ascribed miraculous properties.³² Nature's perfect food; the ultimate biological fluid; a human right; the immortal fluid; fast food for babies, the benefits ascribed to breast milk also provide an exhaustive list.³³

- Fewer infections of the middle ear, gastro-intestinal tract and upper respiratory system
- Less diarrhoea and constipation
- Lower risk of allergies and asthma
- Less obesity in later life
- Higher IQ's
- Less eye infections e.g. sticky eye
- Less meningitis
- Less septicaemia
- Better responses to immunisation
- Less appendicitis
- Fewer unexplained cot deaths
- Less Crohn's disease
- Less coeliac disease
- Less dental decay
- Less cancer e.g. lymphoma, breast cancer, ovary and womb cancer
- Less vitamin A deficiency
- Better brain and nerve development
- Better visual development and eyesight
- Less diabetes
- Less heart disease
- Less multiple sclerosis
- Less schizophrenia
- Less nappy rash

³² Heinig, MJ; Dewey, KG; *Nutrition Research Reviews*, Health effects of breastfeeding for mothers: a critical review, (1997), p35-56

³³ Ibid, p35-56

- Less juvenile rheumatoid arthritis
- Fewer inguinal hernias
- Less neurological problems
- Contraceptive effect – contains population explosion, spaces children
- Better bones
- Less rheumatoid arthritis

In Third World countries breast milk may offer the only sterile fluid around: it can be imperative to the survival of a child. In the developed world the advantages of breastfeeding over bottle-feeding are less obvious. However, as most of the benefits included in the above list have now scientific research behind them, it can be concluded that breast milk is the best way to feed a baby. It is also known that when breast-fed babies get sick they are known to recover sooner than those fed on formula milk³⁴ (see also 1.2.4).

The more we learn about breast milk the more incredulous it seems that any baby can survive or thrive on any substitutes for it, yet there are many who have. The majority of baby boomers of the 1950's and 1960's were reared exclusively on formula milk and today almost 40% of infants in this country are still bottle-fed from birth, especially in some Northern regions of England.³⁵

2.2.2 Milk Production

The breast is an integral part of a woman's reproductive system. It swells at puberty and unlike other mammals, never flattens back (see 1.1.1) but in terms of milk production how does it work?

Clinical experience suggests that unless the baby's feeding technique is improved by better positioning, milk production will decline to below his needs.³⁶

The breast is made up of 15 - 20 segments each containing a gland leading to a main duct which opens at the nipple. Reservoirs under the nipple known as lactiferous sinuses distend as they fill with milk. Production of milk by the milk glands is influenced by prolactin and other hormones. Each milk gland is surrounded by a fine network of blood vessels which carry hormones to the milk producing cells. It is blood which provides the materials from which the cells make milk. Prolactin is the hormone that triggers milk production. Milk usually starts to be produced soon after delivery but can start earlier. A simplification of the process is as follows:

- Prolactin is produced by the pituitary gland in the brain
- Nipple stimulation by the infant sends messages along nerves to the pituitary gland to tell it to make more prolactin
- Milk trickles into milk ducts

³⁴ Angier, N, *Woman*, Virago Press, (1999), p.154

³⁵ Hamlyn, B, Brooker, S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, (2002) TSO

³⁶ The Royal College of Midwives, *Successful Breastfeeding*, Longman (1991), p.2

- Stimulation by the baby's mouth boosts prolactin which reaches its peak within 30 or 40 minutes of starting a feed

Many women believe that leaving a long period of time, say two or three hours, between feeds will help her to produce and store more milk. This is a dangerous myth as a raised prolactin level increases the milk supply so that the more the baby feeds at the breast the more milk will be made. Waiting longer between feeds does not produce more milk because prolactin levels are effectively decreased. Interestingly, prolactin is allegedly responsible for boosting the concentration of endorphins in the blood. Endorphins are hormone like chemicals also stimulated by prolactin.

Research shows that the hormones in lactating rats buffer them against stressful situations. This may also be true in humans. Some people go so far as to call prolactin 'the mothering hormone' or 'happiness hormone'.³⁷

Physiological observations already in this section: recommended longer feed times and the release of endorphins, for example, could effect the design of the breastfeeding chair. It becomes reasonable to conclude that sitting down for longer periods and ensuring a calm ambience again will affect the design thinking. With regard to a calm ambience, what follows could be particularly relevant.

As mentioned earlier, when the milk glands make milk it trickles into the milk ducts filling the reservoirs under the nipple. This first milk known as fore milk is the first to reach the baby. It is lower in fat and so fewer in calories than hind milk (the bulk of the milk) Hind milk remains in the milk glands and is available only if the let down reflex works, which squeezes it from the glands, through the ducts and to the nipple.

2.2.3 The Let-Down Reflex

The let down reflex is responsible for releasing hind milk. When the muscles contract around each gland the hind milk is released quickly into the ducts and the milk is said to have been let down. Hind milk rich in calories contains 30 calories per fluid ounce compared with only 10 calories per fluid ounce in fore milk. Most babies would not thrive without hind milk. It is hypothesised that the effectiveness of this reflex is determined by the ambience of the environment:

In order for the child to be properly nourished the mother needs to breastfeed in a relaxed and reassuring situation so that the let-down of the hind milk is not inhibited.³⁸

There is another hormone responsible for this let down reflex: oxytocin. The let down reflex is a physiological reflex conditioned by the woman. The baby's presence is a powerful stimulus, but just the sight, sound or even thought of her baby or even sometimes someone else can trigger it. Stimulation of the nipple then is also an important oxytocin trigger. A reflex is outside conscious

³⁷ Drs. Stanway, P&A, *Breast is Best*, Pan Books, (1978), p.18

³⁸ Maher, V, *The Anthropology of Breastfeeding*, Berg, (1992), p.166

control. Messages travel along nervous pathways from the nipple to the pituitary gland where they trigger the release of oxytocin into the blood. Oxytocin then travels to the breast where it makes the muscle cells contract around the milk glands, squeezing milk into the ducts. This cycle can be summarised as follows:

- Trigger e.g. Sucking, sight or thought of baby
- Messages to pituitary gland sent
- Oxytocin released
- Contraction of muscle cells
- Release of milk into ducts

As with prolactin earlier, Doctors Penny and Andrew Stanway believe that environmental factors can affect the mother's let down reflex and they advocate a 'special nursing chair':

The time the let down reflex takes to work varies from woman to woman and also depends on many other factors including a woman's surroundings and how she feels....Some baby books talk about buying a special nursing chair. You may think this sounds like a waste of money. However a comfortable place to breastfeed is a very real help as it is all too easy to end up after a feed with aching shoulders and arms if you aren't relaxed.³⁹

Being unrelaxed can prevent oxytocin from making the muscle cells around each milk gland contract and so preventing oxytocin being released from the pituitary gland.

Having summarised how the mother produces the milk, what follows is a summary of how her baby receives it. Again, indications relating this to the design process for the breastfeeding chair are pronounced.

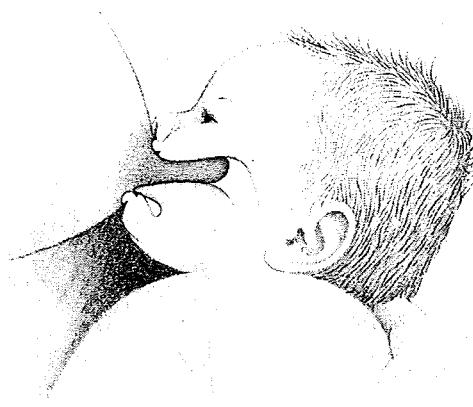
2.2.4 Latching On: Milk Release and Infant Sucking

As introduced earlier (2.1.4) the physical attachment of a baby to the breast is imperative to the progression and continuation of breastfeeding. The mother's position whether she is sitting, lying or standing in relation to her baby will invariably affect how she feeds (see 2.3). An understanding of physiologically what is happening to her can inspire designers to understand why she might need to sit in a particular way, or need a glass of water beside her, or a muslin square to hand, for example.

Milk is transferred from the mother's breast to her baby by a combination of two processes:

- Active milk expulsion by the mother due to her let down reflex
- Active removal by the baby who by working on the tissues of the breast with its jaw and tongue, strips milk from the milk ducts

³⁹ Drs. Stanway, P&A, *Breast is Best*, Pan Books (1978), p. 20



6. Many self-help publications show the baby's head in relation to the breast but rarely show the woman's seated position.

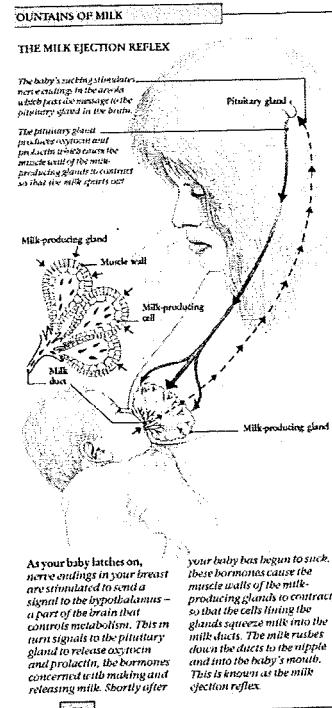


Fig. 27



Fig. 28

These images from Successful Breastfeeding (RCM) are one exception.

Both processes are necessary to ensure that the infant obtains both the full volume and the full nutrient content of the feed.⁴⁰ Positioning at the breast features in many publications aimed at both midwives and health visitors, as well as in the many available self help books. Other than illustrations showing the baby's head in relation to the breast, there are rarely any illustrations which show the broader picture of the woman's seated or lying position in relation to her breast and her baby's head (Fig 6). Illustrated overleaf are two comparative examples: one where only baby's head and breast are shown, the other where the rest of the woman's body is visible. The mother and the baby work together as follows⁴¹:

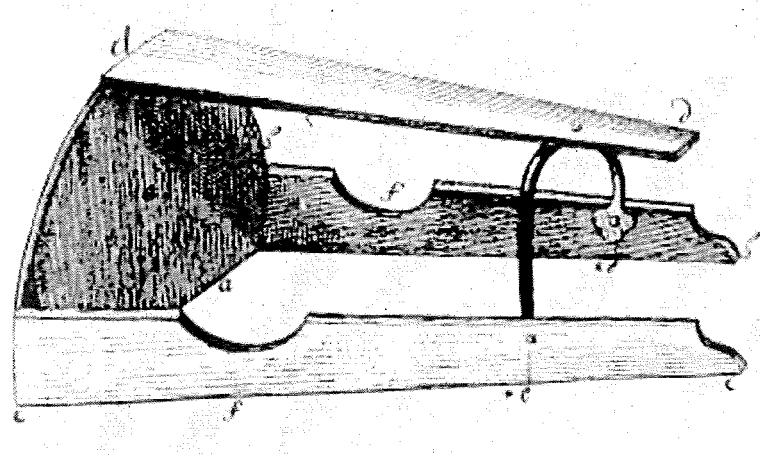
- The baby should be close to his mother with his head and shoulders facing her breast. The baby's whole body should be square onto the mother and his nose should be at the same level as the nipple.
- Then, with a swift, positive and well directed action the baby should be moved straight towards the breast. The nipple should be aimed into the upper third of the mouth, so that it goes past the tongue and drives against the roof of the mouth and goes quite far to the back of the mouth.
- Opinions differ as to which hand should be used for supporting and presenting the breast, and which should support the baby and move him towards the breast. Mothers will often have a preferred side. Many mothers will benefit from supporting their own breast with the fingers placed flat against her ribs at the base of her breast or with her hand cupping her breast. When supporting the baby the mother should either support the baby's head and shoulders on her forearm, or hold her baby across the shoulders with her free hand supporting his head with her fingers.
- If the baby is properly attached his mouth will be wide open and the lower lip will be further away from the base of the nipple than the top lip. The bottom lip curls back automatically and will be some way from the base of the nipple. The baby will have a mouth full of breast, including the whole nipple, much of the areola (the darker coloured circle of skin around the nipple) and all the underlying tissue including the milk ducts.
- This will cause a typical jaw action as the baby works to milk the breast. The jaw muscles work rhythmically and this action extends as far back as the ears.
- The baby will terminate the feed of his own accord by coming off the breast spontaneously.

2.3 Postural Considerations and Observations

Mothers can feed babies in three different positions: sitting up; lying down and standing (Fig 7). Some people believe that incorrect positioning is one of the most serious causes of breastfeeding failure. Positions that are appropriate for later feeding when the infant is well established on the breast may not be appropriate for initiating breastfeeding and for the early feeds. In the UK,

⁴⁰ The Royal College of Midwives, *Successful Breastfeeding*, Longman, (1991), p.3

⁴¹ The Royal College of Midwives *Successful Breastfeeding*, Longman, (1991), p.18



7. The arcutio wooden cage, Italian, seventeenth century, used to protect an infant sharing a bed with an adult, it was equipped with a gap to allow for breastfeeding.



Lying down and standing up are useful positions in some situations.

because we no longer see breastfeeding happening as an everyday event, no one learns how to do it:

Breastfeeding is not an instinct and it has to be learned. Non-human primates such as chimpanzees have to learn about both sex and suckling by observation when they are young and if deprived of this, have problems with both activities when they reach maturity....This is why expecting breastfeeding to happen by telling women to do it, is such a ridiculous goal. It is rather like expecting good performances from choirboys who have always been forbidden to listen to music.⁴²

The observation of our parents, siblings and friends breastfeeding is obviously likely to be a good way of learning how to do it but as we no longer see it as an everyday activity, the role models are increasingly hard to find. As discussed earlier (1.2.6) portrayals of breastfeeding women in the media are rare or misleading. Art can however provide some startlingly strong positive images of breastfeeding women and clues about posture can be found. Although it is not easy (*Breasts in Art* by The Bridgeman Art Library for example, does not include one example of a woman breastfeeding⁴³) the examples that can be discovered are without doubt celebratory and informative, particularly in terms of postural considerations and comparisons.

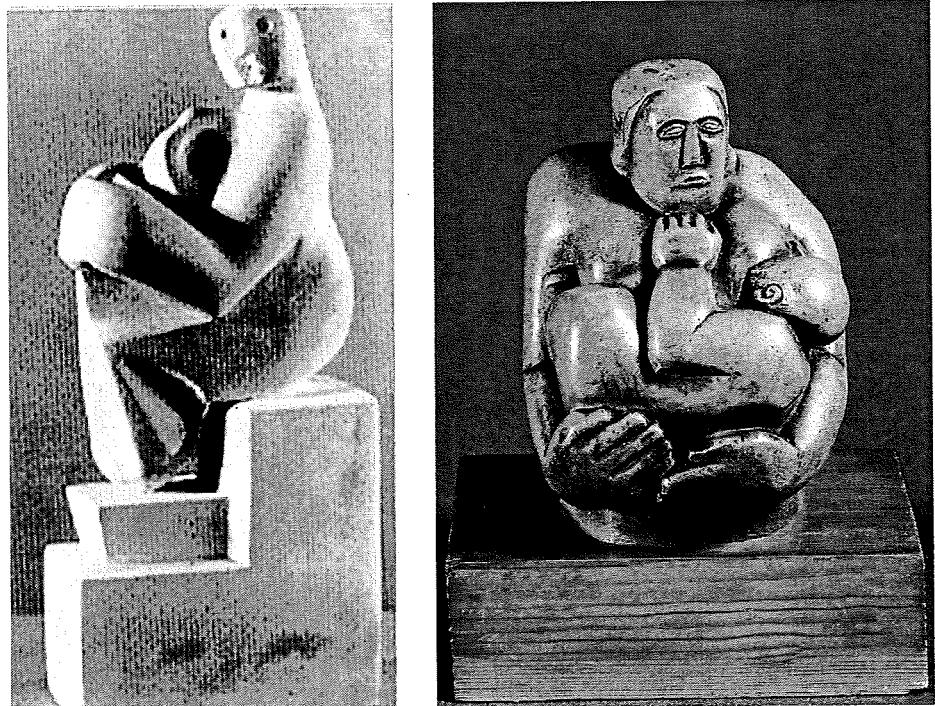
Henry Moore's stone *Seated Figure*, 1928, depicts the universal theme of motherhood with the mother figure seated with her infant on her high lap as it would be on a low seat, and her back erect at almost 90 degrees from her lap, which, as discussed in the following chapter, depicts ergonomically correct breastfeeding posture. The highly stylised figures seem to also depict some of the tension present when trying to attain physical comfort in readiness for breastfeeding (Fig 8).

As a way of recording posture, paintings and sculpture can illustrate some very useful examples. One of the most informative and moving of these is seen in a painting by Diego Rivera (1919) titled *Mother - Angelina and the Child Diego* (Fig 9), a cubist portrait depicting Rivera's partner in Paris with their son Diego. She is seated on a chair on which she leans slightly forward, with her breast falling forward. Her right leg is raised up on her left (as preferred by Sheila Kitzinger 2.1.1; 3.3.6) so raising the height of her lap to support the child. The gaze of the woman forms a triangular sequence to the eyes of her baby and over to her left shoulder, a position promoted by many breastfeeding experts. This painting epitomises the issue of posture and indicates the form a breastfeeding chair would need to take in order to function ergonomically. Although it's cubist style blurs our perception of the chair, the impression the painting offers is one that meets the key criteria of the design brief evolving from this study: it is low seated, has a high and erect back and it could have a variety of aesthetic styles and colours.

Lying down to feed is a useful position particularly when feeding several times during the night or when feeding following a caesarian section.

⁴² Palmer, P, *The Politics of Breastfeeding*, Pandora, (1993), p.48

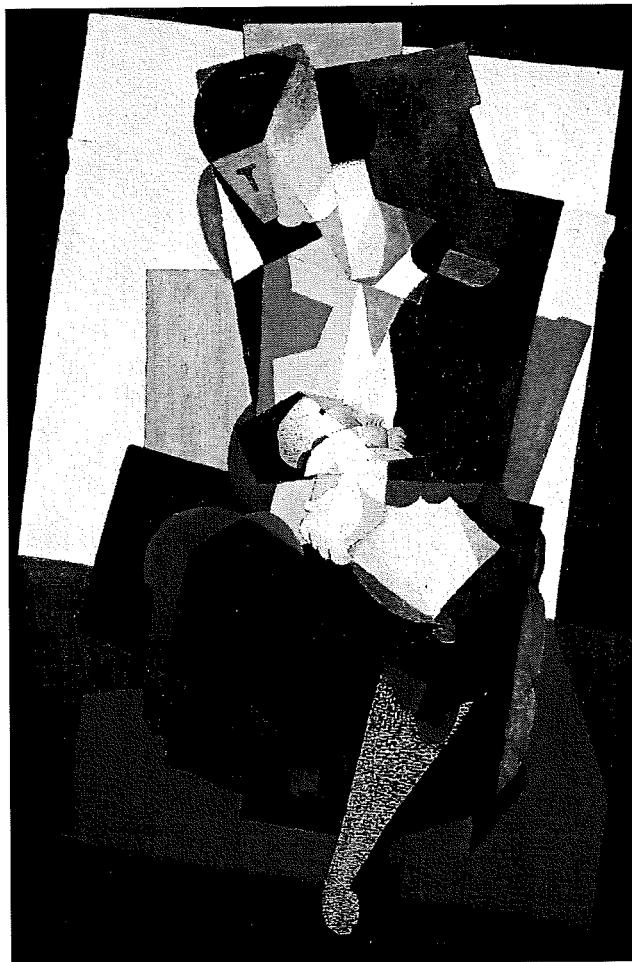
⁴³ Bridgeman Art Library, Edited by Ortola-Baird, *Breasts In Art*, MQ Publications Ltd., (2000)



8. Sculptures by Henry Moore

***Seated Figure*, 1928 (left):**
The block under the mother's feet suggests a desire to raise the lap height of the mother to ergonomically suit breastfeeding.

***Maternity*, 1924 (right):**
The mother keeps the height of her baby at a functional height for breastfeeding.



9. *Mother - Angelina and the Child* Diego, by Diego Rivera, 1916

This cubist portrait suggests a chair form that aids breastfeeding posture and is thus ergonomically appropriate for breastfeeding. The clues are:

- The position of the baby on the breast
- The low seat height, therefore raised lap height of the mother
- The height of the chair back
- The positive direction of the mother's gaze in relation to her baby
- The positive position of the mother's feet on the floor

The many different aesthetic styles collaged into one chair indicates that it is ergonomics rather than style that dictates good breastfeeding posture.

To achieve correct positioning of the baby at the breast while seated the mother should be encouraged to lean forward slightly so that the breast falls forward, facilitating attachment. Leaning back flattens the breast making attachment much more difficult. Chloe Fisher writing in *Successful Breastfeeding* suggests:

She may need additional pillows to support her back or arms, or raise the baby to a more comfortable level. Having attached the baby correctly the mother can then be encouraged to relax her back and shoulders against the supporting chair. A footstool may also be a useful aid to relaxation. Modern furniture does not lend itself to good breastfeeding positioning. Often it is too soft, has obstructive armrests and/or sloping backs. Hospital beds and backrests which encourage the mother to lean back are similarly unhelpful.⁴⁴

Fisher is describing here typically the scenario when a midwife or health visitor is trying to initiate breastfeeding at the very early stages after the birth of a baby. Sometimes this will happen in the hospital where the baby was born, but often, especially when a mother is released from hospital within 24 hours of the birth, the initiation of breastfeeding takes place in the home, sometimes with the help of a health visitor or midwife, but often not. During these early stages, the requirements of a breastfeeding chair might be different to those of a chair to be used when breastfeeding has been established. For example, mothers learning to breastfeed in special care baby units can be observed sitting on chair seats covered with plastic sheeting as a mother might be bleeding from her perineum.

Getting into a good breastfeeding position quickly is important to instil confidence in the mother. As the mother's confidence grows, so too does her ability to feed in unusual places. Fig 10 shows several examples of women breastfeeding in such places: on an aeroplane, in the car, and even a depiction of a woman breastfeeding on a boat. The image of the Himba woman (Fig 11) is of particular interest in terms of breastfeeding posture: the erect angle of the wall she leans against and the low height of the wall she is sitting on suggest that she has selected this place to sit for its ergonomic appropriateness. Similarly, if ever you notice a woman breastfeeding in a car or on an aeroplane, notice if she has adjusted the angle of the seat back into its most upright position (Fig 10, and Fig 8: Chapter 4).

2.4 Conclusion: Chapter 2

The physiological aspects of breastfeeding discussed in Chapter 2 are of interest to a designer because we can begin to see anthropometrically what a woman is doing when she breastfeeds. When her milk is 'let-down' (i.e. the initial flow of milk) how does she tend to position herself, where is the gaze of her eyes and so on? These are the first clues we can use to establish any ergonomic criteria for the chair. Psychologically, similar considerations can be made and can be useful to the process of ergonomic decision making. For example, how do ambience and spatial factors influence a mother's mental state? How is the psychological pleasure of breastfeeding relevant to

⁴⁴ Fisher, C, The Royal College of Midwives, *Successful Breastfeeding*, Longman (1991), p.5
115

Seated in a boat



116

Seated in a car



10.

Postural considerations:
Seated in an aeroplane





11. Postural considerations:
Himba woman, Opuwa, Namibia, Twentieth Century.



Painting from a contemporary Cypriot art magazine, 2001.



Kneeling Mother with child at the
breast by Paula Modersohn Becker,
1906, Nationale Galerie, Berlin.

design? There is plenty of evidence to suggest that chairs can effect us physiologically and psychologically, especially in office seating,⁴⁵ but there is no evidence of what happens in this respect when women breastfeed in chairs. Whether by instinct or by nurture, how do mothers behave? What do they do with their feet and their arms? Do they realise that they are doing it? How do they feel when their milk is released and their infant suckles? How do they re-arrange the objects around them to effect change in their posture or their mental state? The answers to these questions provide a pre-cursor to the design debate that is Chapter 3.

It is evident that an understanding of psychology, anatomy and physiology is more than useful for the designer of a breastfeeding chair. In summary, it is most useful for a designer to be aware that:

- The psychological preparation of the environment in which a woman intends to feed does evidently affect a woman's ability to produce milk.
- The historical observations made by Freud and Bowlby, for example, offer an understanding of emotional attachment, which could help mothers and designers to understand the need for skin to skin contact and the breastfeeding instinct.
- Breastfeeding for many women is a highly sensual activity. Confidence can be improved by the response of the mother to the objects and the environment around her when she feeds. The feel of a fabric against her skin and the satisfaction of using her chair for example, will evidently affect her mood and her emotional and physical responses.
- An understanding of physiologically what is happening to her may help a mother to feel less stressed.
- An understanding of the benefits of breastfeeding will promote a mother's confidence.
- Positive role models, like being able to observe more women breastfeeding in everyday life and in art and sculpture will inspire women to feel less alienated and more confident in their own ability to breastfeed

In most Western societies the position for breastfeeding is sitting upright on a chair. We have now evolved with the chair as a fundamental accessory to our daily lives. (see 3.1) Correct positioning of the baby at the breast while seated will be the position now investigated and will serve to introduce the design project (Section B).

'Modern furniture does not lend itself to good breastfeeding positioning'⁴⁶

⁴⁵ see p. 181 and Fig. 38, later in Chapter 3

⁴⁶ Fisher, C, interview with the author, (13/6/00)

Section B: A Chair For Breastfeeding Mothers: Research and Development

Introduction to Section B

This section of the thesis introduces the role and the activity of design in relation to designing a chair for a specific function. Issues raised in *Section A: Historical, Cultural, Social and Political Context*, comprising of Chapters 1 & 2, will be frequently reflected upon throughout this section of the text, in order to indicate to both designers and non designers how an awareness of issues such as those discussed in Section A, can provide the most fundamental design criteria for the brief that is detailed in Chapter 4. The section is divided into two chapters:

- Chapter 3: Design Research
- Chapter 4: Design Development

Chapter 3 begins with an account of the primary research and leads into a debate inspired by those chairs found in the homes, hospitals and clinics where women were observed to breastfeed. An account of the history of design as it relates to chairs lies beyond the scope of this dissertation, therefore the chairs that have been selected in this chapter are used quite deliberately to illuminate the debate and to support the proposal for a new breastfeeding chair. Chapter 4 explains the design brief and gives an account of the design methodology used. Selected examples of sketches, models and prototypes are shown to describe the process of designing the breastfeeding chair and the final prototype is described at the end of the chapter.

Using carefully selected chair examples it is proposed in this section that:

- Historically *nursing chairs* were not designed for breastfeeding.
- Comfort is an ambiguous concept.
- Many chairs are too big for large numbers of women, especially for those women needing to comfortably breastfeed in a chair.
- Not many chairs are offered in more than one height.
- Accessoried chairs designed during the 1950's and 60's were close to being ergonomically correct for breastfeeding.
- A new breastfeeding chair can only be designed well in the light of the primary research and the secondary research conducted for this study. Primary research is imperative to this kind of design project.
- Industrial collaboration can have a positive effect on the design development process.
- Industrial collaboration can have a positive effect on the educational process for designers.

- Designing chairs in isolation of the end user increases the risk of mistakes and misinterpretations of use.

3. Design Research

Introduction

Material, popular, social and economic cultures influence the design, manufacture and use of products. Values and issues relating to the manufacture of objects are also relevant. Similarly, there are issues of gender, race, class, economy, scale and beauty to consider. Ecological issues too cannot be underestimated; designers must ‘reappraise their role in the production of fashionable lifestyle products and minimise the impact of these ephemeral goods by concentrating on durable, multi-user, multi-purpose designs’.¹

A designer can make an assumption, as many do, about how necessary their proposal for a product is but without research that substantiates a need for it and a proper definition of that need, there is a real danger of ultimately more ‘junk’ being added to an already product polluted world. Is it not arrogant to design a chair, get it manufactured and then expect people to buy it, without finding out firstly what the real needs of the users are?

Making profit is still the primary motivation behind many designs we see in the shops on our high streets today, so where does the responsibility of the designer begin and end? Are designers responsible for ensuring that people get a good deal: that the maker is fulfilled; that the manufacturer is profitable; that the consumer is respected; that the planet is protected? Can consumers affect the status quo? And what of the responsibility of the manufacturer? It is my belief that it is the *shared* responsibility of the designer, manufacturer, marketer and consumer/user and the collaboration between them that will ultimately lead to a successful product, in this case, a chair.

Without proper research which includes rather than excludes people and their behaviour, designers will continue to design in ignorance and chairs that don’t quite work, are not quite comfortable and are not suited to their purpose will continue to find their way onto the market. This project begins with the designer establishing a comprehensive understanding of the user and their task specific requirements: what does it really and practically mean to breastfeed in the UK today?

¹ Fuad-Luke, A, *The Eco-Design Handbook*, Thames & Hudson, (2002)p.18

Primary research brought to light many needs and preferences, including dimensional, tactile and psychological considerations, and the observations made throughout the primary research stage provided a unique series of both qualitative and quantitative data. As Fuad-Luke argues:

Aside from the essential physical resources, humans need comfort products to achieve a level of emotional, spiritual and social well being. Since comfort products tend to be used over a longish time, rather than being ephemeral, the design parameters can embrace durability and therefore judicious use of resources.²

Many of the women interviewed during the primary research for this study expressed a desire to have a chair that they could treasure and pass on to their daughters, sisters and friends. Hence, durability became imperative to the design criteria for a breastfeeding chair at the early stages of the research. They also suggested alternatives to ownership of a chair, for example, baby clinics could loan chairs out to mothers until breastfeeding is initiated. Their experiences and their advice are included in the next chapter section. In summary, evidence collected and discussed in this chapter includes:

- Evidence collected from primary research including six case studies of breastfeeding women, five site visits and six interviews with specialists in the field of breastfeeding.
- Evidence of breastfeeding in public and its relevance.
- Nursing chairs and their meaning.
- Samples of chairs currently used for breastfeeding.
- Historical chairs and their relevance.
- Upholstery and the development of a most appropriate upholstery fabric for a breastfeeding chair.

3.1 Research Methods

3.1.1 Background

As previously described in the Introduction, in 1995 the *Community Practitioner's and Health Visitor's Association* (CPHVA, formally HVA) established a partnership with *The Royal College of Midwives* to form a strategic alliance known as *Invest In Breast Together*. The aim of the partnership was to promote communication about breastfeeding between the two professional organisations and to develop ways of training professionals in working together to promote

² Fuad-Luke A, *The Eco-Design Handbook*, Thames & Hudson, (2002), p. 18

breastfeeding. This was established in the light of the UK statistics, which at that time indicated disappointingly low breastfeeding rates. The *Invest In Breast Together* partnership commissioned Sally Kendall to develop and write a training programme for health visitors and midwives.³ This was funded by *The Department of Health* and was first published in 1995, followed by a second updated edition in 1997. It was after the launch of the second edition that the partnership, in consideration of other strategies for promoting breastfeeding, asked Sally Kendall to approach a furniture designer from *Buckinghamshire Chilterns University College (BCUC)* about the potential for a new chair for breastfeeding women. This dissertation marks that response. Subsequent discussion with *The Invest in Breast Together* partnership led to the formulation of four key questions:

3.1.2 Research Questions and Aims

- What was the perceived need among women themselves for a chair to support breastfeeding?
- What is the current availability of such furniture in areas where women might be expected to breastfeed both in public areas and in the home?
- What is the perceived need for such a chair among professionals and other experts in the field?
- What ergonomic data is required for the design of a breastfeeding chair?

In answering the above questions, the overall aim of the research was to design and test the utility of a new chair for breastfeeding women.

3.1.3 Values and Ethics in the Research Process

The relative merits of the above questions and the value judgements made needed some forethought when ascertaining their place in the social research process. A researcher, whatever their view on values and research, is constantly applying, either consciously or subconsciously, judgements about what is right or wrong in the conduct of the research. For this reason ethics are part of research practice and need to be born in mind by the researcher. This was particularly relevant to the primary research for this thesis. Where researchers critically reflect upon their own views or those of others, or consider the justification for their actions in comparison to others, they are using philosophical ethics. This recognition of ethical issues needs to form part of the research practice, otherwise social research can easily reflect the prejudices of society in general, or of a research community in particular. For example, it would have been ethically insensitive to

³ Kendall, S, *Invest In Breast Together*, CPHVA, (1997)

interview a woman breastfeeding if it were going to cause her too much embarrassment. Therefore establishing her consent prior to interviewing her would be imperative. Likewise, permission was required to take photographs of her and further to use them in the study.

3.1.4 Primary Research: Interviews

Privacy in the context of this thesis was most challenged when working with breastfeeding women themselves. Prejudices about whether to breastfeed or bottle-feed were repeatedly encountered for example, and it was difficult to determine on first meeting with a woman how at ease she might feel by the questioning or photographing of her. Had I appeared with a clipboard in my hand and a dictaphone, I could have put her in a state of stress and tension. Therefore an approach and a structure to interviewing was taken that allowed women to respond in their own terms and to only respond to those issues with which they felt at ease. An initial introductory letter confirmed what the aims of the research were. It was also made clear that if they felt in any way uncomfortable with the questioning, they must say so. Consent and the permission to photograph was obtained before the start of each interview when the participants were also reminded of the purpose of the study.

Issues of postnatal depression were not formally taken into account, and as far as could be ascertained from observation and self-report, it was perceived that none of those interviewed as case studies suffered from the condition. I was aware of not asking anyone to participate in the study that was unduly stressed or nervous: the purpose of the research, which, in the pursuit of knowledge aims to alleviate suffering, was made clear from the outset. I sensitively planned all interviews to ensure that no discomfort or embarrassment was caused. On telephoning prior to interview many women chose interview times to correspond with their baby sleeping or feeding accordingly. Some of the interviews were conducted outside the home, for example in a café or whilst shopping, by request.

Anonymity was adopted for all case studies and other women interviewed. This, in spite of the fact that at the time of the interview none of them objected to being named, or to having photographs of them breastfeeding used for the purposes of the research. (At a later date one woman did withdraw her consent to use her name and image). As all women were volunteers from the community, ethics approval from a medical ethics committee was not sought although all the above ethical principles were adhered to.

This form of interviewing is referred to as informal, unstructured or semi-structured interviewing. This method was chosen because it was felt that structured interviews might exclude the person

from expressing the subject in their own frames of reference. By not predetermining the boundaries of the interview, I enabled the person being interviewed to talk more freely and more intimately about the topic. This is an interview method supported by Anderson, who believes this approach challenges the 'truths' of official accounts particularly when interviewing women:

Interviews with women can explore private realms such as reproduction, child-rearing and sexuality to tell us what women actually did instead of what experts thought they did or should have done. Interviews can also tell us how women felt about what they did and can interpret the personal meaning and value of particular activities.⁴

Similarly, Clifford and Gough (1990) support a less rigid interview format. Describing ethical issues with reference to nursing research they state that:

The nature of the subject under review lends itself to a more subtle approach in determining the patients reactions to the condition. Informal interviews are an alternative that may be utilised, for conversational techniques may be less stressful than the rigid format of a structured interview.⁵

Therefore, largely by employing conversational techniques, both quantitative and qualitative information was gathered. Other methods such as self-administered questionnaires and large postal surveys for example were also considered, though it was decided that the disadvantages of such methods, in this instance, outweighed the advantages. The subtle nuances of the environments, relationships and activities of the women were more clearly determinable from more intimate meetings with them. The risk of non-compliance or of ensuring a high return rate of questionnaires was judged to yield less informative results. Direct observation often resulted in the women being surprised themselves when their actions were brought to their attention. One example of this was when none of them realised their tiptoeing feet in an effort to raise the height of the lap (3.2.7). New mothers also feel that they have a lot to do and filling in questionnaires could be perceived to be an unnecessary chore, whereas an interview over a cup of tea was, in some instances, welcomed as an opportunity for them to maintain contact with the outside world.

Such interview methods included working directly with breastfeeding women in their homes. Field notes and sketches were also kept from women interviewed at clinics and hospitals. **It should be**

⁴ Anderson, cited in May, T, *Social Research: Issues, Methods and Process*, Oxford University Press, (1993), p. 94

⁵ Clifford C & Gough S, *Nursing Research: A Skills Based Introduction*, Prentice Hall International, (1990), p.33

remembered that my main aim was to observe and discuss how people sit when they breastfeed and how they felt about the sitting positions they adopt.

The results of this research are quantified in this section. The development of new ergonomic evidence additionally and importantly came from these interviews and from activities with breastfeeding women. The evidence is discussed both in this chapter, Design Research and in Chapter 4: Design Development.

In order to answer the research questions the following methods were adopted:

- **Case Studies**
- **Interviews With Women, Practitioners and Professionals**
- **Site Visits**
- **Survey of Relevant Furniture**
- **Test-Rig Evaluation** (detailed in Chapter 4: Design Development)

(Interviews with professionals and experts in the field of design are included in Chapter 4)

3.2 Research Observations: Case Studies

Introduction to Methods

Rather than sending out questionnaires to anonymous women, as stated earlier, I chose to target women I had some connection with, either through specialists I had been working with, or through women I already knew. Sensitivity was a major issue. These volunteers from the community formed a key role in the development of prototypes of the breastfeeding chair.

In the first instance I wrote to ten women asking them whether they would consider being a case study for the research between September 1998 and September 1999. Enclosed in each letter was a disposable camera which they were informed that they need not return, together with a request to ask someone at home to take photographs of them at different times of the day breastfeeding. In response to the letters sent, five women telephoned to confirm that they would like to be part of the study. None of the remaining five responded to the letters. It is important to note that the women approached were chosen quite deliberately to represent a geographical cross section of the UK. The six women represented came from:

- County Durham
- Aylesbury, Buckinghamshire
- St. Albans, Hertfordshire

- Bristol
- Thame, Oxfordshire
- Manchester

I then arranged to meet five of these six women at their homes (the sixth was interviewed shortly after the birth of her son, in hospital) and took my own photographs and in some cases video footage of them breastfeeding. Each session lasted approximately one hour. Field notes and sketches were made and photographs taken, usually about eight or ten photographs or sketches at each interview. One woman did not wish to be photographed but did send me an edited set of photos a month after my visit. Trying to establish a relaxed ambience so that the women did not pose artificially was important so that the photographs reflected the reality of the scenarios. In most cases this was achieved.

Photographing the problems many breastfeeding women encounter is fraught with difficulties, as many women are embarrassed to be photographed with their breasts in view. Photographs taken during the interviews with these five women are the most informative and showed women using a plethora of bits and pieces, from ironing boards to adjustable garden chairs in an effort to establish a comfortable posture. Observations of what women actually do, the way they move, the way they reach for things and the way they struggle to get comfortable whilst holding a small infant, often crying for food, inspired original and thought provoking ideas for development.

Taking each case study separately I analysed the development of the seating positions of the mothers. I also was careful to observe the scenario as a whole: the objects the women felt they needed to have to hand, the number of drinks they required, their lighting requirements and the lengths of time they each spent at one time seated. The room (or garden) in which they preferred to use their chair was also noted.

An important aspect of the primary research was measuring the women. Although I recorded their overall height, I was most interested in the anthropometric measurements of their legs when seated: the distance from their buttock to their knee (popliteal length) and the distance from their knee to their ankle bone (popliteal height). The measurements taken from the five women are presented later (4.3.) where they are used to determine the new ergonomic criteria for the breastfeeding chair. The significant contribution these women made to the overall design of the chair will be clarified at the end of the section.

3.2.1 Case Study 1: Carly

Carly was the first case. She is a museum curator in Newcastle. When I first came to interview her, she was feeding her second child and had established a confident and successful routine:

You feel raw, cold, uncomfortable, sweaty, sticky, revolting and sore, often all at the same time. The chair should give you that feeling you got from your own mother: lovely and snugly. It should also give you the opportunity for repose...⁶

She is a very keen and enthusiastic advocate of breastfeeding. Her first child breastfed for six months during which time she visited *The Breastfeeding Clinic* at *The JR Hospital* on several occasions with feeding difficulties. Her second fed 'more easily and happily' and for a much longer period of nearly two years, indicating that experience gained from the first child feeding established a more successful pattern second time around. Some of the fundamental practical, functional and ergonomic observations from this period of Primary Research came in the first instance from this case study.

Carly was the first of three case studies to prefer breastfeeding outdoors indicating that the month of birth affected comfort. That is, her babies in both cases were born in the spring, when outdoor temperature enabled outdoor feeding without too much discomfort from the cold. She also observed temperature effects when discussing the difficulties encountered when feeding during the night, when the central heating is usually switched off and the house, in her case a tiny Seventeenth Century cottage, is cold and draughty.

Furniture Observations:

She had established for herself an ergonomic seated position absolutely in line with that advised by the *Infant Feeding Clinic* at *The JR Hospital*.⁷ She sat no higher than 360mm from the ground adopting a straight back, flat lap posture in a 1950's *fireside chair*, upholstered in original vinyl (Fig 51, later). Although the seat height was appropriate the angle or rake of the back of the chair was obtuse which forced Carly to use cushions and pillows to bring her back into a functional and ergonomically correct position. As cushions and pillows are fluid or dynamic in their form it is difficult to maintain the correct back angle using cushions in this way, although all the women in the case studies used them:

I think because all my cushions are filled with feathers it's difficult to get them to stay in the right place. You can see they're falling all over! I do have a favourite one (Fig 51) but

⁶ Case Study 1, interview with the author, Co. Durham, (9/5/99)

⁷ Inch,S, interview with the author, (10/10/97)

find it's too big and bulky to take anywhere. I do feel happier to have it with me and take it in the car when I remember. It's become a bit like a comfort blanket for me.⁸

The need of breastfeeding women to consume large quantities of fluid was first observed during an early research visit to Carly. When breastfeeding in the presence of a toddling sibling, water or often hot tea was frequently knocked over (Fig 1). During a one hour long visit I observed two accidents with Carly's drinks, providing the inspiration to include a safe place for a drink in early design development sketches. This later became a fundamental requirement as **all mothers observed for the study shared the same problem.** Mothers are advised by *The National Childbirth Trust* to 'to drink enough fluids while breastfeeding so you do not become constipated.'⁹ Breastfeeding mothers drink an average of 3 litres of fluid each day.¹⁰ Compared to the normal recommended daily amount of fluid intake, however, this is not excessive.

Similar observations were made with regard to a cloth for wiping mother's nipples, babies drool or 'posseting'.¹¹ Carly was insistent about having a convenient place to put her muslin square. These are exactly what they sound like: pieces of muslin measuring approximately 300mm square, sold in packs of twelve through all baby care stores. Originally designed for lining nappies, with the advent of disposable nappies their other uses have superseded their original one. They are now the indispensable cloth, often seen thrown over the shoulders of mothers when 'winding' their babies or draped over the arms of sofas. Softer than the J-Cloth, they double as flannels, towels and wipes in every household with infants. In Carly's house, old muslin squares still have a life: they are used as dishcloths. Other mothers told of their children keeping them as comforters as they grew. In summary, Carly's efforts by her to improve her comfort as seen in the stills from the video (Fig 2) included the following strategies:

- She used pillows to support her lower back and to bring her into a more upright position
- She hid her drinks, usually hot tea, underneath her chair
- She placed her chair underneath the washing line to provide shade for the baby (and she said to check when it is dry!)

The interviews with Carly totalled eight and provided the most comprehensive evidence of the five case studies. She could reflect on the experiences of three different babies and was able to talk of how her ability to relax when feeding improved with each child. She did feel however that

⁸ Case Study 1, interview with the author, Co. Durham, (9/5/99)

⁹ Lewison, H, (NCT) *Your Choices For Pregnancy and Childbirth*, Ebury Press, (1991)p.166

¹⁰ From observations made by the author, (1998-2001).

¹¹ Term used to describe vomited milk in babies.

Case Study 1: Carly



1. When breastfeeding in the presence of a toddling sibling, water or often hot tea is frequently knocked over.

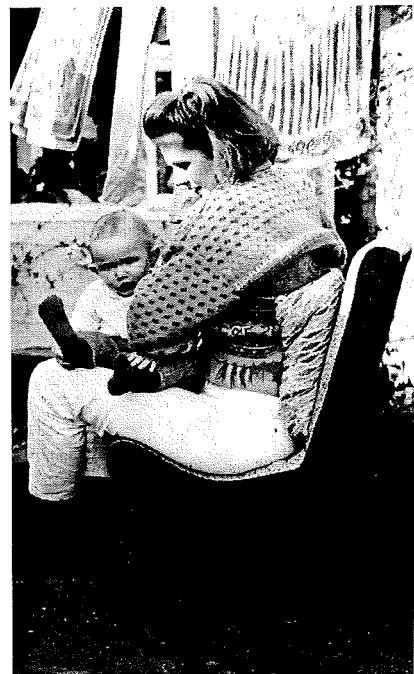
Case Study 1: Carly



2. Toddling sibling demanding simultaneous attention.



Outdoor feeding preferred.



Familiar chair in which Carly feels confident.



Domestic juggling – she is able to feel if her washing is dry.

social attitudes towards her breastfeeding in public had not improved over a period of six years from the birth of her first son to her last:

My experiences of breastfeeding the three of them have been different. My confidence definitely improved, probably because experience taught me not to be so anxious and to recognise a bad midwife. The personalities of midwives and health visitors make a big difference. When a personal friend agreed to be my midwife for my second child my experience was totally different. I lost all my confidence with my first midwife, which I am sure did not help me to get breastfeeding off to a good start. My chair is great! It has been my best friend, and I keep it just in case we have any more! I used to regret being unable to take it with me shopping or just visiting, which is when I felt people stared at me the most, particularly in the supermarket. Breastfeeding in public did not used to bother me so much with F, but it seemed to bother others still, which is amazing in 2002!¹²

3.2.2 Case Study 2: Susan

I already knew Susan socially which meant that it was relatively easy for me to organise the first visit to her home and to consequently follow up any queries I had. Meetings with strangers would require more time as I felt I had to allow for a 'getting to know' period initially. Her experience was perhaps the most negative of the group, which also led it to be one of the most helpful in terms of research as she was most eager to share her experience with me in an effort to make improvements for women following in her footsteps. To begin with, prior to the birth of her baby, she approached the experience with confidence as *Stoke Mandeville Hospital* enjoys such a good reputation. However, this was to change:

I was outraged by the way I was treated in hospital. By the time Harriet was two days old, she had fallen out of bed with me on two separate occasions whilst I was trying to get to grips with the feeding, which threw any confidence I had completely out of the window. I had very little help and didn't, on reflection, have a clue what I was doing. I had had an extraordinarily long labour and was very very tired. When I did have the energy to get out of bed the chair provided, by the bed, was plastic covered, sticky to the touch and too high, so much so that my feet didn't touch the ground. I never felt the feeding would work in there, and decided that it would all come right when I got home. Inevitably, it didn't.¹³

¹² Case Study 1, interview with author, Co. Durham, (5/6/02)

¹³ Case Study 2, interview with author, Aylesbury, (20/12/00)

Susan was then thirty-six years old and had had her first child, Harriet, in December 1999. Unlike Carly, Susan gave up exclusively breastfeeding when Harriet was only four weeks old, although she continued to combine bottle (formula milk) and breastfeeding for three months.

The whole experience for her was a struggle. She gave birth in *Stoke Mandeville Hospital* in Aylesbury where there is no breastfeeding clinic, which is not unusual in this country.

Furniture Observations:

From the photos taken at the hospital two days after the birth it is clear to see Susan's frustrations. For example, in Fig 3, she has to sit on a chair designed for geriatric use. There is no other chair in the room apart from a Robin Day polypropylene visitor's chair, being used by her partner.

The chair she uses is typically found in hospitals and hospices where geriatric patients need a higher than usual seat height to aid getting out of the chair. It would be impossible for her to acquire the necessary posture to breastfeed in this chair. Nevertheless, a midwife proceeds to help her, using this chair. Her towel is draped over the chair, partly an effort on Susan's part to prevent staining of the seat but additionally, and perhaps more relevantly, she said she wanted to feel 'more at home' adding that the towel made her feel cosy (A later case study synopsis will pick up on this point). She too had several glasses of water around her hospital bed. She had put pillows around the bed on the floor as she had a constant fear of dropping Harriet (the bed was 650mm high). The aforementioned chair was beside the bed and a nurse had pulled a curtain around her, her baby and her partner in an effort to preserve their privacy. These photos are particularly poignant. On the first two images in Fig 3 she looks uncomfortable and embarrassed. Her clothes are tangled around her neck, her towel is sliding off the chair and her partner looks understandably concerned for them both. On the second photo taken the following day (Fig 4), she appears to be slightly less flustered and frustrated but surrounded by medical equipment and fluorescent lights, she told me how she felt tired and humiliated:

Loss of dignity is the worst feeling. Looking back now at the photos I feel so angry to have been treated so badly. How could they let me struggle like that under such bright lighting, with people coming in and out all of the time. It was totally humiliating.¹⁴

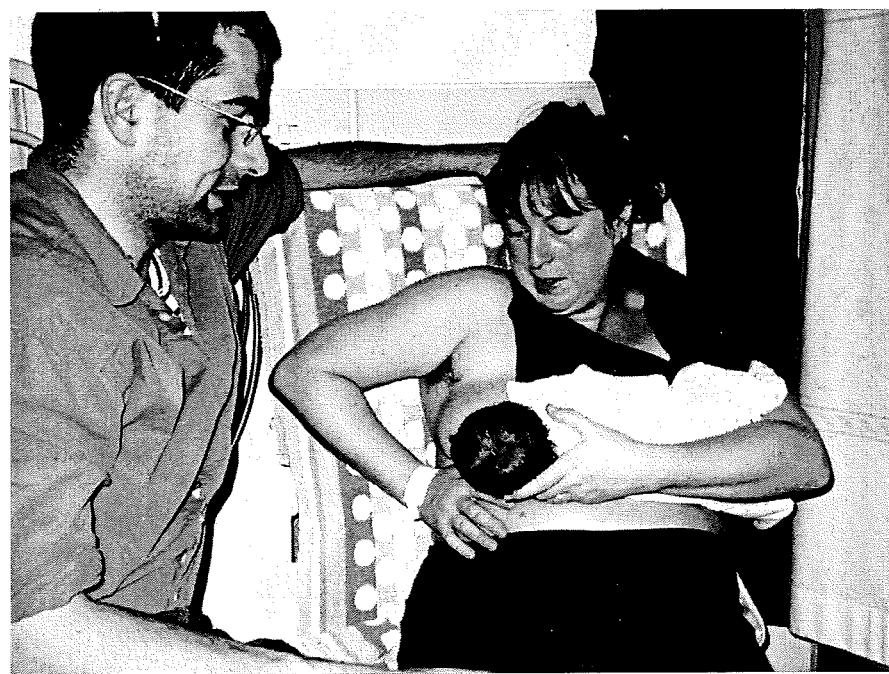
As previously discussed (see 2.1), Michel Odent and Bianca Lepori both emphasised the importance of giving birth and breastfeeding in dimmed light and in non-medical environments so it is hardly surprising that she felt unable to relax in the environment described at the hospital.

¹⁴ Case Study 2, interview with the author, Aylesbury, (3/3/00)

Case Study 2: Susan



3. She is observed using a chair which was designed for geriatric use.



She feels uncomfortable and embarrassed as she pulls the curtain around her for privacy.

Case Study 2: Susan



4. "Loss of dignity was the worst thing"

Surrounded by medical equipment, Susan feels humiliated and angry.

On her return home from hospital her mother had brought over the chair she herself had used in the 1950's to breastfeed Susan and her other children. She had had it recovered in a red woollen upholstery fabric. Susan was thrilled, although when she tried to feed in it she realised it needed adapting. We put pillows behind her to change the rake of the back and put a 150mm high sewing box under her feet to make her lap flat. This is how she continued to use the chair. Efforts made by her to improve her comfort when breastfeeding can be summarised in the following way:

- In hospital she always placed an old towel over the chair to cover the sticky feel of the vinyl upholstery.
- She had put pillows around the bed on the floor as she had a constant fear of dropping Harriet.
- She had actively sought out the expertise of Chloe Fisher, a breastfeeding consultant from another hospital more than twenty miles from her home, and driven at night to Chloe's home for help.
- She used an old sewing box under her feet to raise the height of her lap.
- She used two pillows to support her back.
- She was assured by the familiarity of the chair her mother had successfully breastfed her children in.

The overriding success of the chair for her was the fact that it had been in the family for forty years and it gave her the safe and cosy feeling she had been wanting in the hospital. Remember too that her own mother had successfully breast-fed in this chair, which Susan said she often reflected on when she fed Harriet, giving her confidence and assurance.

Sadly, Susan reluctantly introduced formula milk at four weeks and continued with a combination of formula and breastfeeding for three months when she finally and with feelings of both deep regret and deep relief, stopped breastfeeding Harriet (Fig 18).

3.2.3 Case Study 3: Hattie

Hattie was a stranger to me prior to my visit to her home to interview and photograph her breastfeeding. Her baby was born in May 2000. Her experience of breastfeeding was much more positive than Susan's and her concerns were more to do with the practicalities of having things close to hand and getting her back support correct.

Furniture Observations:

Fig 5 shows two of the earliest photos of them. She is feeding her son in bed. Her muslin square is hanging behind her over the bedstead. It is also interesting to note that her baby sleeps in a moses basket beside the bed and not in the bed with the mother, as advocated by Sheila Kitzinger earlier in the study (see 2.1.1.). Hattie has two pillows and a 'v' shaped pillow propped up behind her back. She felt this to be one of the most comfortable positions she ever found to feed in and therefore did not worry too much about feeding through the night, which she did for one year, several times a night. As with Carly, Hattie wanted to feed him during the daytime outside in the garden as it was summer. Fig 6 shows her sitting fairly upright in a garden chair she could easily adjust. Though she still found that she had to raise her toes on tiptoe, she is able to bring the angle of the back of the chair into such an upright position that her breast falls forwards making attachment to the breast easier. This chair is therefore more appropriate than any other chair in her home for breastfeeding. The shadow around her on the grass indicates there to be a parasol shading them both from the sun:

Feeding in the garden is always better. I am more relaxed and less distracted. It always takes me a while though to get settled. I'll sit down thinking I have everything I need within arms reach and then realise I have forgotten my water, or the phone. Now I try to have everything I need on the pushchair, which is great because then I have everything with me if I need to feed whilst I am out. He is feeding so much at the moment I sometimes feel I am having to look for somewhere comfortable to sit every half an hour, which if you're shopping or on a bus can be difficult.¹⁵

In Fig 6, her baby is well attached to the breast (see 2.2.4). The 'v' shaped pillow can be clearly seen here to be replacing the function of a higher lap height, as her seat, though comfortable, is too high. Her toes are quite telling: **she is on tiptoes, trying to raise the lap height. This is a common observation with breastfeeding mothers.** Pictures of other case studies clearly indicate the same problem. The pushchair acts as the accessory holder for her in this instance. Her muslin square is hanging on the handle and she has baby wipes, breast pads, and tissues stored in the tray beneath the cradle. Her watch is deliberately placed on the cushion in front of her: she said that she always wanted to know how long he took to feed and could plan the rest of the day in her head whilst she fed. This kind of clockwatching was noted by Sheila Kitzinger (2.1.1) as a common phenomenon in the West, when women are busy fitting in work and housework into their daily schedules. This favoured garden chair was often brought into the house for her to feed in as she began to associate successful feeding when sitting in it. In Fig 7 she is seen sitting on a very soft sofa with no back support at all. She said this was the least effective position in which to feed. Her breast is falling backwards instead of forwards and her v-

¹⁵ Case Study 3, interview with the author, St. Albans, (28/5/00),

Case Study 3: Hattie



5. She uses her 'v' shaped pillow to support her in an upright position. Her muslin square is hung over the bedstead close-by and a 'moses' basket suggests that the baby is not sleeping skin to skin with the mother.



6. Her feet are on tiptoes and her garden chair is preferred for it's adjustability. Siblings could sit close-by, her accessories are beside her in the pushchair and she is timing her feed.

shaped cushion is sliding off her lap. In summary, efforts made by her to improve her comfort were:

- She raises her toes on tiptoe to raise the height of her lap
- She uses three large pillows to support her back
- She sits in a garden chair because she can more easily adjust it to an upright position
- She tries to use her 'v' shaped cushion to raise the height of her lap (Fig 7)

She takes advantage of the manoeuvrability of her pushchair by using it as storage for her feeding accessories. It houses: five muslin squares (four folded up inside, one hanging on the handle); one packet of baby wipes; one *Mothercare* box of breastpads; one box of tissues; two hair clips and one small tube of nipple repair cream, further useful evidence of the need for storage to be accommodated by a breastfeeding chair.

3.2.4 Case Study 4: Julie

Julie lives in Bristol and as her husband is a long haul airline pilot, she spent long periods of her time alone with her baby. Fortunately for her, her local health authority have a very strong support system for breastfeeding. Although there is not a breastfeeding clinic at the hospital she attended, there was a network of midwives and breast care nurses who were on call 24 hours a day. As a mother who had undergone a Caesarean Section, she was placed on a priority care list for breastfeeding support. Despite this she said:

It took me eight weeks to find a comfortable position to breastfeed in. The best position in the end was sitting up on the floor against the sofa because you need your thighs up don't you?¹⁶

Eight weeks of breastfeeding a baby six, seven or more times a day uncomfortably is a long time. From Fig 8 we can see that what she is doing is putting her thighs at a raised angle by crossing her legs and her back in a position that is 90 degrees to the floor.

Julie is 36 years old and has two children. She had both her children by Caesarean Section. During the initial few weeks after both her births, her stitches troubled her but did not affect her ability for breastfeed both times. With her second child, she agreed to allow me observe her behaviour as a case study.

¹⁶ Case Study 4, interview with the author, Bristol, (20/4/01)

Case Study 3: Hattie



7. This is Hattie's least successful breastfeeding position:

- This very soft sofa has no back support at all
- Her breast does not fall forwards
- Her 'v' shaped cushion is sliding off her lap



8. Some women did find that breastfeeding on the floor against a sofa was a well supported breastfeeding position.

Furniture Observations:

Although it is evident from the photographs of her feeding that she often sat propped up with cushions on a very large and soft sofa, her favoured choice was an upright wicker chair (Fig 9). Wicker is an interesting material for a chair in this situation as it is firm yet flexible. Many mothers preferred to have some element of flexibility as well as absolute support. This is a difficult balance to achieve as we will see later in Chapter 4, Design Development. These photographs give some extremely useful clues to the efforts made by her to improve her comfort:

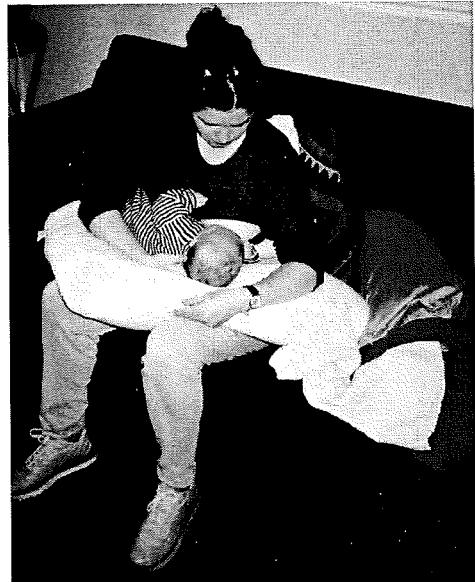
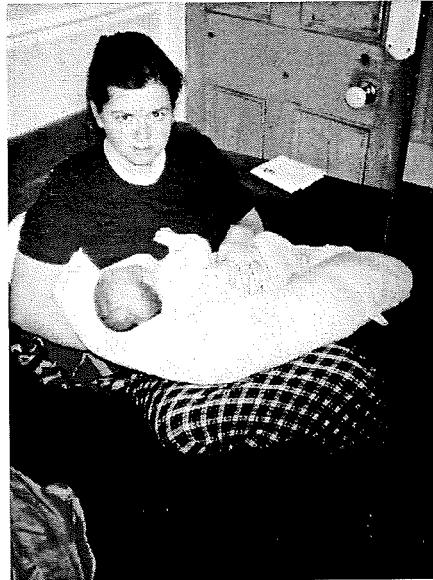
- Her feet are raised on a box approximately the height of an encyclopaedia. She stated when interviewed that because this height increase raised her lap insufficiently, she would cross her legs to raise it. However, what this then meant was that the lower part of the baby's body was supported by the raised leg, the top half of it being insufficiently supported, putting added strain on Jane's right arm.
- The orange cushion visible behind her lower back acts as lumbar support.
- The cushion under her bottom acts as a softener for the prickly feel of the wicker seat, but as it raises her seat height this also has a negative effect on her lap position.
- The trolley beside her was a redundant chest of drawers from a bedroom. With its drawers removed it housed: dressings for her stitches; breast pads; breast milk collection cups; tissues; a small breast pump; some headache tablets; a large glass of water; a cordless phone; a packet of five muslin squares; half a bar of plain chocolate; the remote controls for both the small portable TV and the hi-fi in the kitchen where she sits; two disposable nappies and a packet of wet wipes.

Although the chair has armrests she did not use them to support her arms: she said they were handy for hanging her muslin square on but were in the wrong place to give relevant arm support. Had the angle of her back been more upright and the height of her lap more acute she would not need the support of the cushion as her lap would support her baby and her arms. In Fig 10 we can clearly see her feet on tiptoes, as seen earlier in Fig 6 with Hattie. Despite this position, her lap is insufficiently raised and she is actually lifting the cushion up so cradling the cushion rather than the baby. In Fig 11 Julie is using three cushions and a rolled up sleeping bag behind her back to bring it forwards on her sofa. Her feet are raised on a box thus raising the height of her lap. She no longer needs to be on tiptoes. Julie breastfed for ten weeks from which time she introduced formula milk largely because having another small child of two years old and a career to maintain, she felt that her life was more manageable without breastfeeding (Fig 12) (see 1.2.5, Employment and Breastfeeding).

Case Study 4: Julie

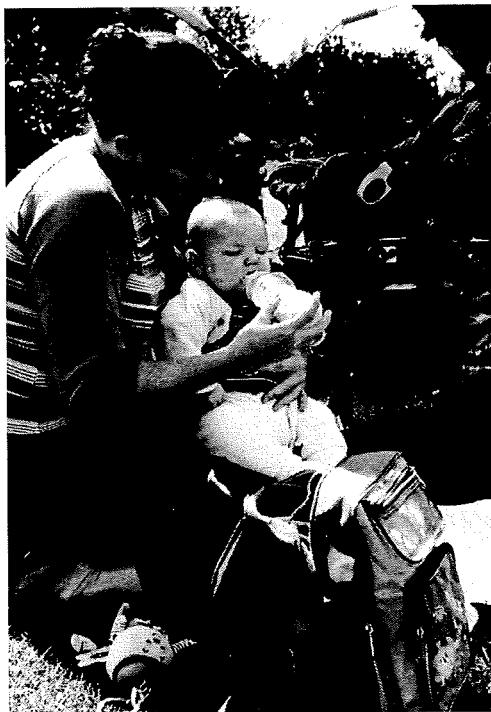


9. An upright wicker chair was her favourite breastfeeding place. Everything she needs is to hand, beside her on a trolley. Her legs are crossed in an effort to raise her lap. Although the chair has armrests, she said they were not in the right place to support her arms whilst breastfeeding.



10. Her feet are on tiptoes. She is cradling the cushion rather than the baby. She sits uncomfortably on her right leg in an effort to raise her lap height.

11. She is using three cushions and a rolled up sleeping bag behind her back to bring it forwards on her sofa. Her feet are on a box, thus raising her lap height. She is no longer on tiptoes.



12. She introduced formula milk at ten weeks.

Julie was diagnosed as having breast cancer when both of her children were under the age of two. Despite having undergone a lumpectomy followed by harsh doses of chemotherapy and radiotherapy, she still maintains that if she has another child she would want try to feed from both of her breasts:

Obviously it's hard for me to think now about doing it all again, but if I did, I would hope that I could still breastfeed. My breast care nurse is brilliant and says that there is no reason why not and that many women only feed from one breast anyhow. It would be hard I know, but yes I would definitely want to try. I am very lucky to live in Bristol. The care I have received here both when initiating breastfeeding and then recently with the cancer has been fantastic. I can't fault it.¹⁷ (see earlier, 1.1.4)

3.2.5 Case Study 5: Christine

Christine, a neighbour, has a medical research background. She proved to be a great research collaborator, allowing me to photograph her breastfeeding in a café and always keen to call me if she thought an observation she had made was worth me coming to photograph (She is a research nurse working at *The Radcliffe Infirmary* in Oxford). She gave birth to Oscar in April 2001. She breastfed him for ten months and only decided to give up because she began to take drugs for another condition that she feared would be passed onto him through her breast milk. Otherwise she believes that she would have continued for a much longer period as she enjoyed it so much. Nevertheless, she claims that comfort was unachievable and that breastfeeding in public was where improvements were to be most useful in terms of furniture and provision:

I love going out and about. Our house is so small I would go mad if I always felt, like I know some mothers do, that I had to feed in private. I haven't had much trouble really. There's a café in town that knows me now. I'll go there for a coffee with a friend or for lunch, sometimes just on my own and feel completely relaxed about breastfeeding in there. I do try and be discrete though as I don't want to offend anyone and sometimes I miss having my cushion with me and find it impossible to get properly comfortable, oh, and the chairs are always too high... (Fig 13).¹⁸

Furniture Observations:

There are some common observations to be made. In the first image we see of her in Fig 14 shows her to be on tiptoes. In her right hand she holds a large one pint glass of water. In the

¹⁷ Case Study 4, interview with the author, Bristol, (30/6/01)

¹⁸ Case Study 5, interview with the author, Thame, (2/7/01)

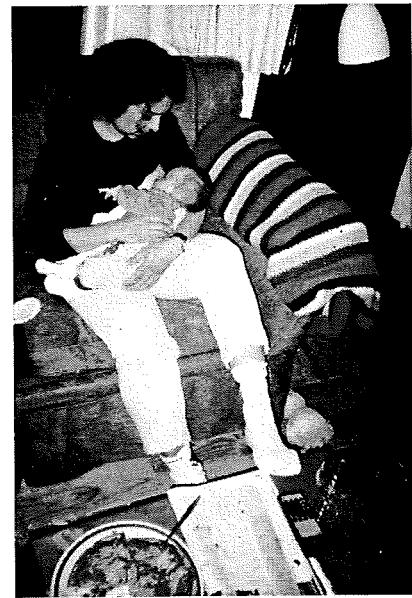
Case Study 5: Christine



13.
Breastfeeding in public, she crosses her legs to raise her lap height. She is unable to feed herself.



14. She is on tiptoes and her cushion raises her baby to her breast.



15. She raises her foot on a coffee table to raise the height of her lap. She is again unable to finish her meal.



16. Her cat is a comfort for her whilst she feeds.

photos taken of her feeding in bed, there is a litre bottle of water on the floor. She found feeding extremely difficult on her sofa as it is so soft and non-supporting and found breastfeeding in bed to be the most comfortable option. Unlike Hattie and Julie she did not have a particular organised storage place for all her accessories, but did appear to have many items around her wherever she sat. It is evident that she too made several efforts to improve her own comfort whilst breastfeeding:

- She is on tiptoes in many of the images of her.
- She is seen to be shifting pillows and cushions behind her lower back and under her baby in an effort to raise the height of her lap.
- She is often observed to raise one leg higher than the other to raise her lap to support her baby (Fig 15).
- She has a drink of water and many accoutrements close at hand on all the photographs.
- She has a variety of reading material within arms reach.
- She finds her cat to be a comfort (Fig 16).
- She keeps a diary of her feeding patterns.

Other things she needed within arms reach are: *You and Your New Baby* reference book; several baby mail order catalogues; TV remote control; cordless telephone; a breast pad; a small tube of nipple cream; pens and pencils; bottle of water; pint glass; a wine glass; a jar of cotton buds; a towel; a *Radio Times*; a small photo of Oscar for her to look at when she expresses her milk, and several muslin squares, again ample evidence of the need for related storage.

3.2.6 Case Study 6: Janet

Janet is a mother I met and consequently interviewed in a north Manchester hospital in 2000. She did not breastfeed. Like many other women in the hospital she had no desire to breastfeed whatsoever. Although she wishes to remain anonymous, she gave me the rare opportunity of filming her preparing to bottle feed her son when he was only twelve hours old. As I filmed, she talked to me:

Question: Did you consider breastfeeding at all?

Answer: Oh no, I just don't fancy it. I am too shy and I would just be too embarrassed. No I didn't entertain the idea for a minute

Searching for more reasons, yet very sensitive of the issue I continued:

Question: How does your husband feel? Is he happier because he can help with the feeds?

Answer: He really would like me to breastfeed and has tried to persuade me to change my mind, but I won't...nobody does it around here. This way is fine.¹⁹

Janet's case is typical of many mothers' feelings, particularly in less affluent parts of the country.²⁰ She feels ashamed and embarrassed and has little understanding of the physiological benefits of breastfeeding. Even with the support of her husband she feels sure about her decision. As Julie Burchill argues (see Chapter 1), without structures in place in society to support the activity of breastfeeding and to promote its benefits, women are going to need far more persuading in the UK to breastfeed and to continue to do so once they have started. Supportive structures which include well designed, well designated feeding areas might help people like Janet to understand the implication of her choice not to feed her baby with her own perfectly prepared milk. The contentious view of some breastfeeding advocates, that the baby's right to breast milk should override the mother's right to breastfeed, is also challenged here.

One of the midwives I interviewed whilst there was a member of *The Association of Radical Midwives*, who are based in Lancashire. She spoke passionately of the problems in the region stating that women are even harder to persuade to breastfeed in North Manchester than in the more affluent South Manchester. She felt that generally the reasons for not breastfeeding were different and dependent on age. Young mothers under the age of twenty one, she believed to be the most difficult to persuade:

They still want to go out and party, be with their mates. They have tenuous relationships with their boyfriends. They too get embarrassed very easily and many of the younger girls will pass over the responsibility of the baby to their own mothers, especially if they are still at school. I do think more could be done at school to educate them. They seem to know so little...²¹

The short piece of film made during the visit shows Janet responding to her baby when he cries for food. He is seen searching for her nipple but her night-shirt is firmly buttoned up to her neck. She calmly places her crying baby down in a plastic (injection moulded) incubator whilst she

¹⁹ Case Study 6, interview with the author, Manchester, (3/3/00)

²⁰ Hoddinott & Pill, *Qualitative study of decisions about infant feeding among women in the east end of London*, BMJ, Vol.318, (2/1/99), p.30-34.

²¹ Senior Midwife, interview with the author, Manchester, (3/3/00)

thoroughly washes and sterilises her hands. She dries them on a paper towel that also looks sterile. She then breaks the seal on a pre-prepared bottle of formula milk, provided for her by the hospital and tries to put the teat in his mouth. Her attempts are all unsuccessful and as the baby rejects the bottle, he continues to cry (Permission to include evidence from this piece of film was withdrawn by the mother).

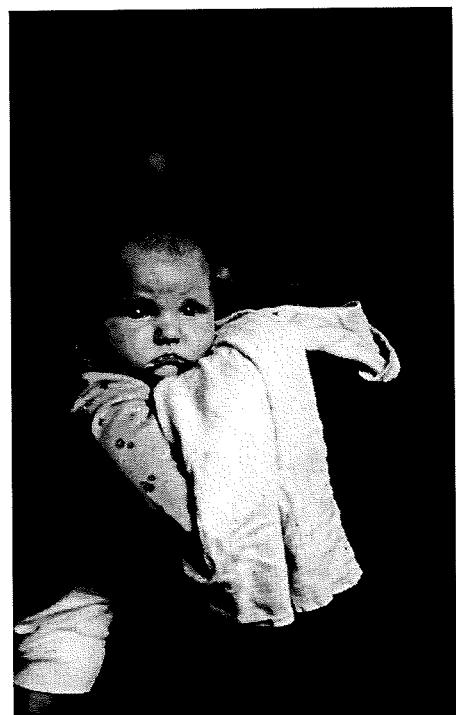
3.2.7 Summary of Furniture Observations: Case Studies

The most common observations about breastfeeding (with the exception of Janet who did not breastfeed) from this exercise were:

- Recognition of the need for external support and direction, for example, from midwives, health visitors, breast care nurses and other mothers.
- The emotional ownership and psychological security a particular chair evoked gave mothers confidence in their breastfeeding ability.
- Every mother used more than one pillow or cushion to raise their lap height.
- Every mother used pillows or cushions to bring the angle of the back forward.
- All of the mothers owned and used a 'v' shaped cushion to raise lap height or to breastfeed in bed.
- Every mother raised her toes on tiptoe to raise the height of her lap.
- An optimum, desired seat height of 360mm was recorded (see also 4.3).
- An optimum angle of the mother's back position of 90 degrees to the seat was recorded.
- Every mother was observed to drink one or more glasses of water or cups of tea whilst breastfeeding.
- Every mother used a muslin square whilst breastfeeding (Fig 17).
- Every mother needed some objects next to them (see below).
- An arm or side table attached to the chair obstructs the movements of the mother and baby.

Mothers typically had the following objects near to them whilst breastfeeding:

- Muslin square
- Water to drink
- TV remote control
- Telephone
- Cushions and pillows
- Breast pads



17. Every mother used a muslin square when breastfeeding, and felt lost without it.



18. Susan feeding Harriet after four weeks of a determined struggle to breastfeed.

- Breast milk collection cups
- Food e.g. Chocolate
- Something to read
- A small lamp
- Nipple cream
- Occasionally, a glass of wine

What women decide they need to have around them is to a large extent personal. However, it is evident from the research conducted that **without exception, the issues of lap height, a drink of water, and muslin squares were problematic**. From the video of Carly we could see that other issues influenced her, like her partner trying to control their other sibling whilst operating his business from home at the same time (Fig 2). But it was Susan who seemed to have the most difficulties. All the images of her say something far more fundamental about her breastfeeding experiences: she looks tired, frustrated and unhappy. As a concluding image, we see Susan feeding Harriet with formula milk after four weeks of breastfeeding (Fig 18).

Summary

All the women studied breastfed for different periods of time:

- Carly: 18 months (second child)
- Susan: 4 weeks
- Hattie: 12 months
- Julie: 10 weeks
- Christine: 10 months
- Janet: (did not breastfeed)

There is clearly a correlation with satisfaction and comfort and duration of feeding period. Their reasons for stopping breastfeeding suggest discomfort as a recurring problem. When asked for a few words to describe their reasons for stopping breastfeeding they said:

- Carly: 'I was frowned upon in public'
- Susan: 'I never recovered from a very bad start when learning to breastfeed at the hospital. The sticky chairs did nothing to inspire me'
- Hattie: 'I needed to go back to work and felt I had done it for long enough'
- Julie: 'Also having a two year old and a job, I couldn't imagine continuing'
- Christine: 'Although I stopped because of my drugs, I was becoming

increasingly conscious of feeding him in public, so may have stopped soon anyhow'

Despite problems for all of them, only Susan and Julie stopped prematurely indicating that the will to breastfeed was strong with all five breastfeeding women. Four of the six women live in the south of England and enjoy relative economic security. However, as I knew from my meetings in Manchester (3.2.6) many of the mothers there do not ever begin breastfeeding and, as acknowledged by the staff, who despite their best efforts, conceded that their breastfeeding rates were lower than the national average. This was the reason Janet was included in the sample.

The contribution these women made to the overall design process was phenomenal. In particular, the sketch development conducted during the interviews was the most informative output of the exercise. **As a research tool, being able to draw and to design things, to measure and apply those measurements to scale drawings, in front of the eyes of the user or client is an asset not to be underestimated. This is where the collaboration of designers and other specialists is at one of the most effective stages of the whole process of designing.**

Likewise, the photographs often indicated detail that went unnoticed at the time of the interview. One example of this was in the photo of Hattie with her watch balanced carefully on her 'v' shaped cushion in front of her. Another common feature only highlighted in the light of the photographic evidence was the recurring incidence of the mother's tiptoeing feet.

3.3 Research Observations: Specialist Expertise

On becoming a working party member of the *Invest In Breast* initiative set up by *The Community Practitioner's and Health Visitor's Association (CPHVA)* in London (3.1.1), contacts made during this period enabled introductions to breastfeeding women and to supportive professionals.

Listed below are the people with specialist knowledge with whom I had contact during the research period. They include professionals from the field of breastfeeding, and an interior designer working in a healthcare environment. Four of these people also work in three of the site visit locations that follow this section: Chloe Fisher and Sally Inch – *The Infant Feeding Centre* at *The John Radcliffe Hospital* in Oxford; Alison Ramsay – *Stockport Maternity Hospital*; and Anne Greer- *Gloucestershire Royal Hospital*. They are also referred to in the main body of the text of this thesis (2.3). Interviews were held with them between October 1998 and November 2001. However, many informal interviews took place after these dates which continued to support decisions about the design development of the chair, particularly in the cases of Professor Sally Kendall, and Sally Inch who were frequently colleagues at conferences about breastfeeding.

3.3.1 Specialist Expertise 1:

Professor Sally Kendall

Co-Supervisor, Professor of Nursing at *The University of Hertfordshire*

Sally Kendall was the principle supervisor on the project. She is an experienced PhD supervisor in health studies with a particular interest in breastfeeding research having both practised as a health visitor, breastfed two of her own children and published in the professional literature on breastfeeding, including *Invest In Breast Together*. She currently holds a *Department of Health* grant to investigate the promotion of breastfeeding among low income women.

3.3.2 Specialist Expertise 2:

Chloe Fisher and Sally Inch

i. **Chloe Fisher**

Senior Midwife, (retired) Oxford Infant Feeding Centre

Chloe Fisher is well known in her field and has gained international status for her lectures and papers on the subject of breastfeeding. She is also author and co-author of many books and articles on the subject of breastfeeding.

ii. **Sally Inch**

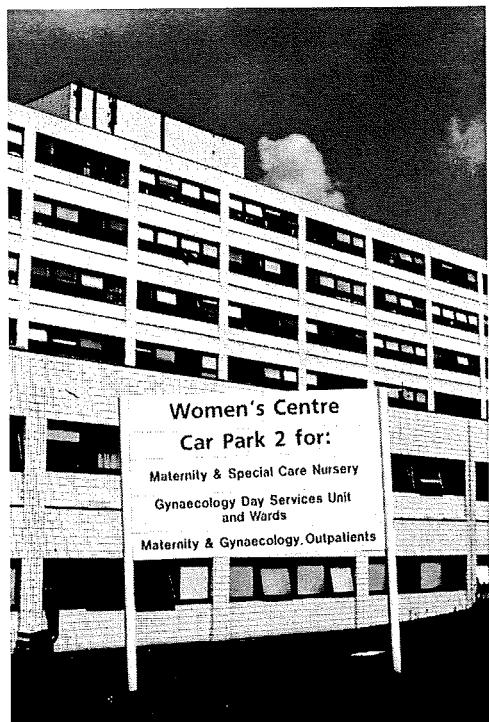
Senior Midwife, Oxford Infant Feeding Centre

Sally Inch has also gained international status for her lectures and papers on the subject of breastfeeding and is the author and co-author of many books and articles on the subject of breastfeeding.

Both Chloe Fisher and Sally Inch were based at Site 1, *The Breastfeeding Clinic* in Oxford (Fig 19) (3.4.1). Although Chloe was retired, she still worked for at least three days a week at the clinic, and often gave consultations to women who are experiencing difficulties with breastfeeding at her home in Oxfordshire. I visited them on several occasions to observe, photograph and measure their furniture, talk to the women in attendance and to discuss their preferences for a breastfeeding chair. During one visit, Sally advised that:

Chairs need only be simple. They need to be lower than normal and they need to support the back. They should ensure that the woman's lap is flat and that her back is straight. That's it.²²

²² Inch, S, Interview with the author, *The Infant Feeding Centre, The John Radcliffe Hospital, Oxford*, 16/11/98



19. *The Infant Feeding Clinic at The Women's Centre, part of The John Radcliffe Hospital in Oxford.*



20. *The Gloucestershire Royal Hospital, Gloucester.*

They are both extremely experienced in the field and often contributed to literature on the subject. They are both frequently quoted throughout the text of this thesis.

3.3.3 Specialist Expertise 3:

Dora Henschel and Sue Botes, The Community Practitioners and Health Visitor's Association-CPHVA (formerly HVA)

i. Dora Henschel

Dora Henschel is a retired midwife of international status and author and co-author of several books on the subject of breastfeeding.

ii. Sue Botes

Chairperson, CPHVA

Collaborating with Professor Sally Kendall (earlier) enabled me to become a working party member of the *Invest In Breast* initiative, set up by *The Health Visitor's Association* (HVA, now the CPHVA) in London, from 1997-99. For a period of eighteen months I attended their quarterly meetings during which time I was invited to give three seminar presentations. This led to me giving two further papers at conferences nation-wide:

- *The International Arts and Health Symposium* Manchester, April 1999
Paper: *Furniture For Breastfeeding Women*
- *The Annual Breastfeeding Conference*, Wexford Park Hospital, Surrey, May 2000
Paper: *Breastfeeding For The New Millennium*

The contacts made at these events put me in touch with more breastfeeding women and supportive professionals nation-wide (see Anne Greer and Alison Ramsay below).

3.3.4 Specialist Expertise 4:

Alison Ramsay

Director of Midwifery, Stepping Hill Hospital, Stockport

Stockport Area Health Authority's Stepping Hill Hospital provides a geographical comparison from a local authority whose breastfeeding rates are considerably lower than those in Oxford.

Comprehensive observations of the furniture used are illustrated later (Site Visits: 3.4.7). Alison Ramsay, *Director of Midwifery* directed my visits to *Stepping Hill Hospital*.

Alison organised two separate visits to *The Maternity Unit* at *Stepping Hill*. The first was to attend an initial meeting where I gave a short illustrated presentation of my research to date to the team of health visitors and midwives based at the unit. The second was to photograph some of the implemented changes and to interview the senior midwife in charge of the maternity unit. This

was a rare opportunity as access to and photography in such units is normally forbidden. Alison was very keen that I should get the most out of my visit:

You are lucky to be here on a day when there are only a few births going on. Most of the birthing rooms are empty so you will be able to see most things. We are trying to make the rooms more homely and would appreciate your comments on the changes we have made. We don't have breastfeeding chairs but would be very interested to try one – do any exist?²³

The bed she refers to has pine facades screwed to it (see Fig 27).

3.3.5 Specialist Expertise 5:

Anne Greer

Art & Design Co-Ordinator, *The Gloucestershire Royal Hospital*

The Gloucestershire Royal Hospital provides information regarding how choices of furniture and fittings are made: who purchases them and how NHS constraints with regard to furniture specification, flooring specification and curtain specification can be overridden to achieve remarkable results. *The Special Care Baby Unit* was the focus for this case study and was supervised by Anne Greer.

I met Anne at the *IHAS* in Manchester (see earlier) where she was one of the keynote speakers, speaking on the subject of colour and design in the interior design of hospitals. I was invited to see the work they had been doing at the hospital to improve the design of many of the interior spaces, including the breastfeeding areas of the special care baby unit. Two separate visits were made to her when I was able to photograph existing furniture and to talk to the staff and new mothers in the *SCBU* about their preferences for breastfeeding furniture and their budget constraints. Anne has an influential role throughout the hospital and her role was most evident when she talked me through a corridor she had recently had painted in very bold colours (see Fig 20):

Everybody imagines that hospitals will only allow magnolia paint on the walls. I even thought that was the case before I worked here. Years ago I remember sticking my neck out at a very stuffy meeting and suggesting that an abstract design by a contemporary artist who was influenced by Kandinsky would work well cut out of lino on the corridor leading to the children's wards. To my amazement everyone loved it and when the job was finished I was given more work and generally all the responsibility for the interior

²³ Senior Midwife, interview with the author, Manchester, (5/3/99)

decoration of the site. Now as you can see there is barely a magnolia wall left in sight. I commissioned the photographs along this corridor, went out and bought cheap but brightly coloured IKEA picture frames as we'd run out of money, and everyone is now talking about it.²⁴

The black and white photographs were all of mothers and fathers with babies and two of them showed women breastfeeding. Since my first meetings with her, Anne has enthusiastically sent cuttings and photographs and has secured a trial of the breastfeeding chair to evolve from the research in the maternity unit at the hospital.

3.3.6 Specialist Expertise 6:

Sheila Kitzinger

Social Anthropologist, author and co-author of several books on the subject of breastfeeding.

Sheila Kitzinger is the author of over 23 books, some of which have been published in 20 languages. I established email contact with Sheila in the first instance, and subsequently arranged to interview her at her home at Standlake in Oxfordshire in November 2001. Known and respected world-wide as a social anthropologist of birth and breastfeeding and as a leading authority on women's experiences of pregnancy and motherhood, she has written and sold more books on the subject than anyone else writing about it. *The Experience of Childbirth* written in 1962, was groundbreaking at a time when detailed information aimed at parents about birth and breastfeeding was scarce. At her home, we discussed many breastfeeding issues although the interview focussed on posture and the furniture preferences she has for breastfeeding. The interview lasted three hours. She is about to establish the first active birth centre in the UK, where women will be encouraged to give birth and to breastfeed in an alternative environment to those offered typically in hospitals. She felt that a properly designed breastfeeding chair would be an imperative product for centres like this as well as for a mother's use in the home. Ongoing through my development sketches with her she stated:

In my latest book *Rediscovering Birth*, for the first time in one of my books I decided to include a section about birth stools and chairs. **I am very interested in furniture and was delighted to see that your chair is not anything like these mechanical, very well engineered things you can see often in birthing rooms in hospitals, with clever looking articulating bits on them.** The first birthing chairs were simple structures, slightly higher off the ground than stools, so that the doctor could sit comfortably in front

²⁴ Ramsay, A, interview with the author, Manchester, (5/3/99).

of the labouring woman and see and feel without the indignity of getting down on the floor. The chairs became more and more complicated though so that it became harder and harder for the woman to move during her labour. Compared to any birth chair a companion who holds, clasps, massages and caresses the mother, who is sensitive to the physical support she needs at any particular moment is superb. As with birth chairs, a breastfeeding chair should permit changes in position and allow space for a partner or other sibling to sit close to her. A couple's double bed, or a beanbag on the floor, remain the most comfortable places in which to give birth.²⁵

This interview confirmed some of my early thinking (Other aspects of this interview are discussed in 2.1.1 Kitzinger's Approach). Just as I was leaving her home she added:

Could I have one in blue and white gingham please, with removable, washable covers?²⁶

3.4 Research Observations: Site Visits

A site was defined as an organisational or institutional setting where women could be observed breastfeeding. Five sites were identified:

- 1 *The Breastfeeding Clinic, The Women's Centre, The John Radcliffe Hospital, Oxford*
- 2 *Thame Health Centre, Thame, Oxon*
- 3 *Stoke Mandeville Hospital, Aylesbury, Buckinghamshire*
- 4 *Stockport Maternity Hospital, Stepping Hill Hospital, Stockport, Greater Manchester*
- 5 *Gloucester Royal Hospital, Gloucester*

Sites were selected following meetings with the CPHVA in London together with local health professionals from the district of Oxfordshire in 1998. Attendance at conferences led to further site visits arranged with contacts made.

Sites were visited between 1999 and 2002. Some sites were visited several times, especially those local to me in Oxfordshire: *The Thame Health Centre* and *The Breastfeeding Clinic* at *The John Radcliffe Hospital* in Oxford. Others were only visited once. Where permitted I took photographs of furniture and interiors, and with the consent of the mother I took photographs of her breastfeeding position. Furniture observations are made at the end of each site summary.

²⁵ Kitzinger, S, interview with the author, Oxfordshire, (23/11/00)

²⁶ Kitzinger, S, interview with the author, Oxfordshire, (2000)

3.4.1 Site 1: *The Infant Feeding Centre: The John Radcliffe Hospital, Oxford*

This provided one of two locations to test the first full size model: a test-rig to define the fundamental ergonomics of breastfeeding (4.3). Following an introductory telephone call to Sally Inch (see Specialist Expertise 3.3), she requested I send her a summary of the research after which she invited me to visit the clinic for an initial meeting and to observe the women breastfeeding for the first time. Several subsequent visits were made.

This is the only infant feeding centre specialising in breastfeeding in the UK and people travel long distances to attend it. Operating on a shoestring budget the two staff who direct it regularly succeed in empowering women to breastfeed. Chloe Fisher and Sally Inch are both senior midwives of international status and together they welcome women from all over the country. With very limited resources it is surprising how much successful work is achieved.

The ambience in the clinic was one of calm and I felt at ease with my test-rig, quickly establishing a rapport with mothers as I interviewed them. I spent sessions lasting approximately half an hour each visit, interviewing women and their partners in attendance at the clinic and sketching their posture as we talked (Fig 13, Chapter 4).

Furniture Observations:

The clinic is small, comprising of two rooms: the larger of the two housing eight chairs, a television and four small coffee tables. Seven of the eight chairs are of timber construction, and according to Chloe Fisher, have been ‘begged, stolen and borrowed’ from other areas of the hospital. Two of these had had their legs sawn down by Chloe to bring them to an appropriate height for breastfeeding. Their seat height measures 340mm at the front edge. The chairs are upholstered either in vinyl or *Bute* style fabric. The smaller room has a bed at one end and a row of chairs running underneath the window. These chairs are used in conjunction with stacks of telephone directories acting as footstools, this time to raise the feet height and effectively raise the lap height. This has the same effect as shortening the leg height of a chair. Chloe Fisher and Sally Inch share a small office area at the end of the room. The facilities are thought to be totally inadequate by the two staff. The furniture is old and inappropriate and there is no private area where the staff can discuss sensitive issues. The telephone is constantly ringing with enquiries from often distraught mothers all over the country and except for the occasional nursing research student working in the clinic, the phone is manned solely by Chloe and Sally. The clinic is only open for three days of the week and is very busy most of the time. Photographs, apart from of the test-rig which was used in the corridor, were not taken as the rooms were so small and busy.

3.4.2 Site 2: *The Thame Health Centre, Thame, Oxfordshire*

Initially following telephone conversations with senior personnel at the centre, I was invited to attend a meeting of the two key midwives and two health visitors who were responsible for promoting breastfeeding in the area. Community midwives and health visitors reported to me at consequent meetings with them on anthropometric positioning and physiological facts.

This was the first time I would meet health visitors and midwives from the *Oxfordshire Health Authority*, who agreed to allow me to record new mother's responses. It was also the first time that I had exposed my test-rig to the public and the medical arena. The meeting with the health professionals was positive, although only three of them had attended, of the expected six. They agreed with my suggestion to talk directly with their breastfeeding mums. Consequently, I spent afternoons in the waiting room of the baby clinic as new mothers came and went about their business. During the session women commented on the seat, showing me how they sat. I started to build an impression of how they were really feeling, being made particularly aware of their tiredness. They seemed happy and positive about the test-rig which made them smile: an indication of how a chair could lift someone's spirits.

Furniture Observations:

For the health visitor's consultations with new mothers they inhabit one end of the waiting area of the doctor's surgery on two afternoons a week. Known as *The Baby Clinic* it deals with all activities, not only breastfeeding (Fig 21). Babies are weighed here on a bi-weekly basis and immunised. There is no designated area for breastfeeding and during several visits there I was only to ever see one mother breastfeeding discretely in the corner of the room. The chairs in the area are typical polypropylene waiting room chairs (Fig 22) and are arranged in a circle when there are meetings involving several mothers at one time, for example, ante-natal classes.

3.4.3 Site 3: Stoke Mandeville Hospital, Aylesbury

I was invited to visit a new mother and father learning to breastfeed at *Stoke Mandeville Hospital* in Aylesbury. The development of new ergonomic evidence came from early activities with breastfeeding women themselves.

Furniture Observations:

The interview was conducted in the four-bedded ward where the mother stayed. Each bed had a vinyl covered high-seated chair beside it. The chair appeared to be designed for geriatric use as its seat height was higher than normal enabling older, more frail people to lift themselves out of the seat more easily. I interviewed the mother and her partner as she struggled to get her baby to latch on in the first instance sitting on this chair. Her partner went in search of a footstool to raise



21. Thame Health Centre.



22. The chairs are typical polypropylene visitors chairs and are arranged in a circle when several mothers meet at the baby clinic.

the height of her feet to effectively raise the height of her lap but was unable to find anything to serve this function. Her partner sat in polypropylene visitor's chair. My interview lasted for about an hour during which time no one came to advise or to help her. It was inappropriate and insensitive to tape record the interview, although photographs and notes were taken. A rocking chair as in Fig 23 was observed in the corridor outside the ward and was believed to have been made available for women to breastfeed in. However, as rocking chairs are not conducive to breastfeeding it would seem unlikely that it was helpful which was probably why it was left out in the corridor.

3.4.4 Site 4: Stepping Hill Hospital, Stockport, Greater Manchester

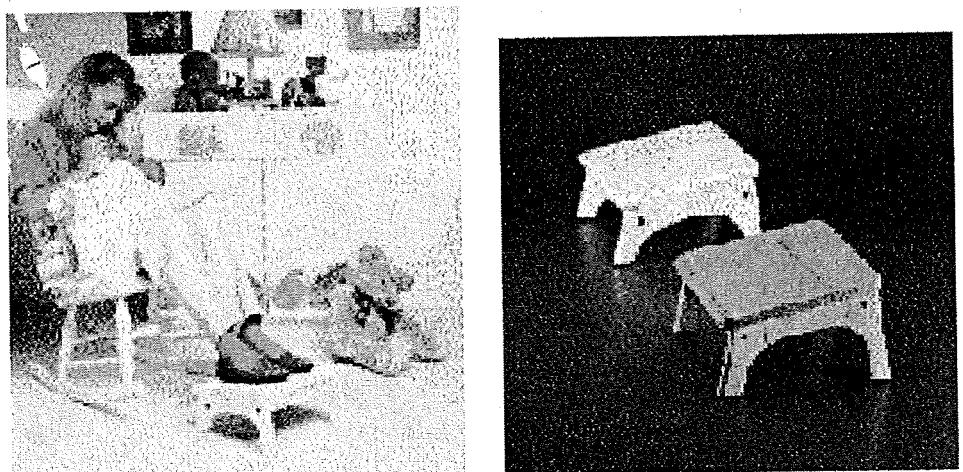
At the IAHS (3.3.3) and following the presentation of my paper *Furniture For Breastfeeding Women*, Sally Carroll, Chairman of Stockport Healthcare NHS Trust invited me to contact Alison Ramsay, Director of Midwifery at *Stepping Hill Hospital*, who she believed was implementing innovative changes to the labour suites in the maternity unit there. Regional differences in breastfeeding rates were brought to my attention for the first time during this visit, as the staff informed me of the lower than average (UK) figures which they were keen to improve.²⁷ Being able to talk to women from less affluent backgrounds was also of value.

Furniture Observations:

A senior midwife gave me a comprehensive tour of the labour suites. These are six rooms designated for labour and birthing. They are located along both sides of one corridor. The midwife had been given lead responsibility for decorating and furnishing the rooms as she felt necessary. She had brought many new ideas to the spaces which she said had at first been met with scepticism by her managers. She was a very keen advocate of breastfeeding and of active birth and as such was very keen to support the design and implementation of breastfeeding chairs.

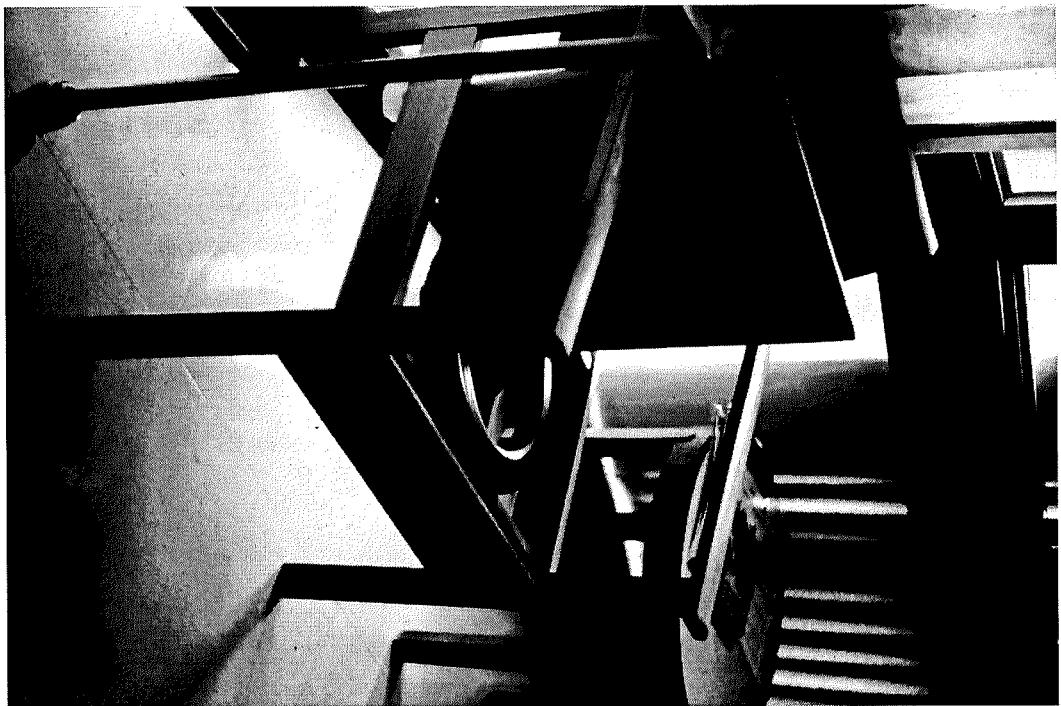
She had designed and adapted a chair herself for delivering a baby on which illustrated how certain she was about some of the ergonomic considerations that were needed. The chair (Fig 24) is a commode, converted so that the midwife can lie on her back underneath the seat and deliver the baby. The midwife becomes covered in blood, mainly on her face, nevertheless she felt that having delivered most of 'her babies' successfully using this chair during the last stage of labour, that it was a necessary piece for every birthing room. She did admit that many of the midwives on her team refused to adopt this method of aiding delivery due to the fear of contracting HIV. Because of her success with this chair, she had set aside another chair to adapt for breastfeeding and was eager to ask my advice on how to do so (Fig 25).

²⁷ Hamlyn, B, Brooker, S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, TSO, (2002),



23. A chair similar to this had been provided for women to breastfeed in at two of the sites visited. Rocking chairs are not conducive to breastfeeding.

24. The sisters in charge of wards often adapt furniture such as this converted commode.





25. A sister in Greater Manchester sitting in a chair she wants to make into a breastfeeding chair.

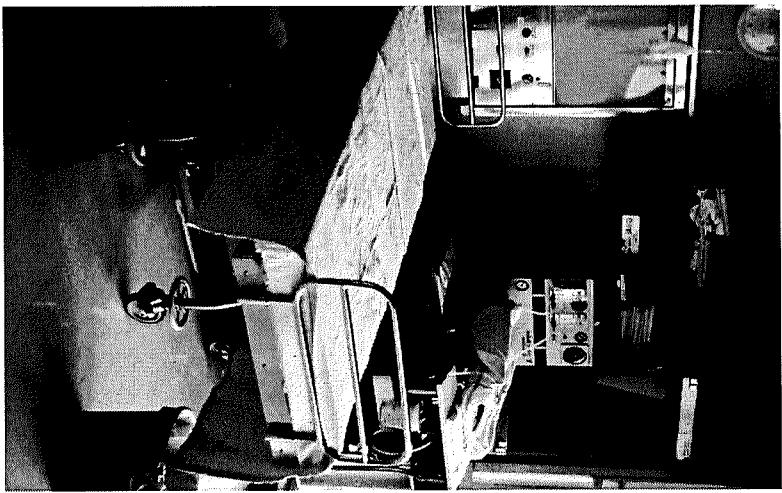
This was a good opportunity to photograph many of the pieces of furniture and accessories that were sited in the rooms where breastfeeding was first established. Fig 26 shows the bed where midwives first help people to breastfeed. The midwife demonstrates the positions adopted for this together with other accoutrements. The foot stirrups are a particularly poignant reminder of the pain of childbirth and as such could affect a woman's confidence to breastfeed (Fig 3, 2.1.5). Likewise the contraction and heart rate monitors usually sited in the birth room can be off-putting and cause unnecessary anxiety.

The bed in Fig 27 has pine head and base boards screwed to it and although on first viewing this appears a token gesture, all women choose the rooms with the pine headboards. Similar additions were being made to the sink area. The day I was there, mirrors and tiles were being added and the wall area around the sink was being painted (Fig 28). The steps up to the bed were being removed as they were believed to be dangerous since a woman in labour had recently over balanced on them. Fig 29 shows an image of a comparative 1960's hospital room from *The Museum of Fine Arts* in Boston, USA, where the domestication of the space is even more obvious and ironic. This example of making a hospital room look and more importantly feel more like a domestic bedroom typifies efforts being made today in increasingly more hospitals around the UK. The stool illustrated in Fig 30 is designed as a surgeons stool, but is used by a midwife or consultant when delivering a baby by forceps or ventouse delivery. Its stainless steel aesthetic evokes the same clinical feel as do the surgeon's tools. I was informed that some women find this to be a particularly off putting object, which the midwives claim raises anxiety levels massively. Small rooms were designated as places where midwives could help initiate breastfeeding yet the furniture was felt by the staff to be inappropriate. The seats of the chairs were all felt to be too high, the vinyl upholstery was believed to be too sticky, and the leg rests provided were all of an inappropriate height and position. The breast pump next to the chair in Fig 31 had a particularly unfriendly aesthetic.

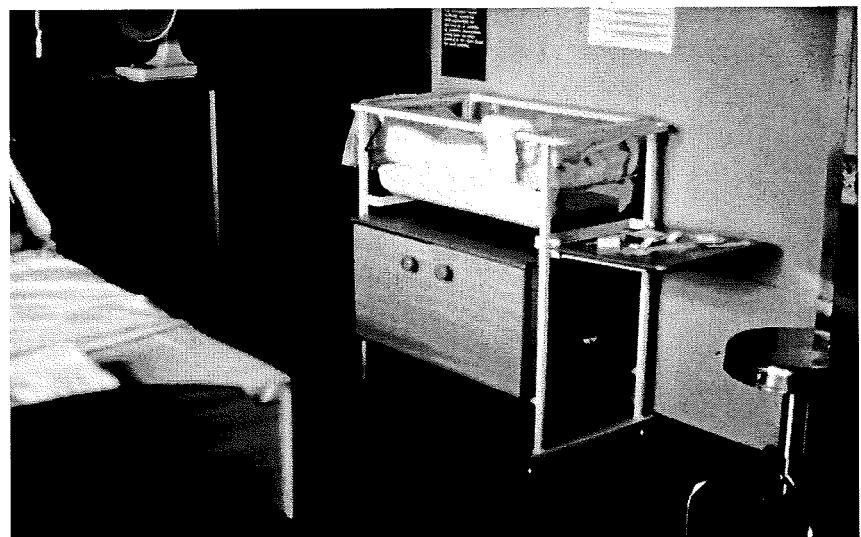
In summary, the furniture observed at this site like at others, is a myriad of styles. All of the chairs are vinyl covered. They are often to be observed in small rooms either alone or in straight rows (Fig 30). It is a case of using whatever furniture is available, and as there is nothing on the market designed for breastfeeding environments, the sisters make do with furniture they can find or that they adapt. Despite their best efforts, the rooms are sparse, inadequate, unfriendly and sometimes very hostile places.

3.4.5 Site 5: *The Gloucestershire Royal Hospital*, Gloucester

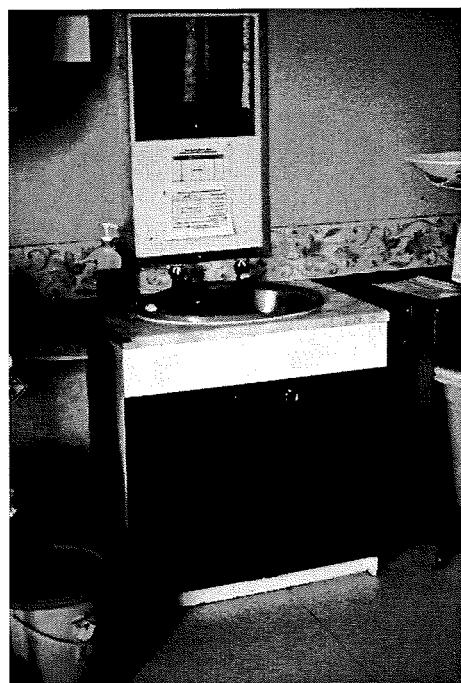
26.
Beds used when teaching women to initiate
breastfeeding, Greater Manchester, 2000.



Typical furniture observations:



27. Pine headboard attached to hospital bed.

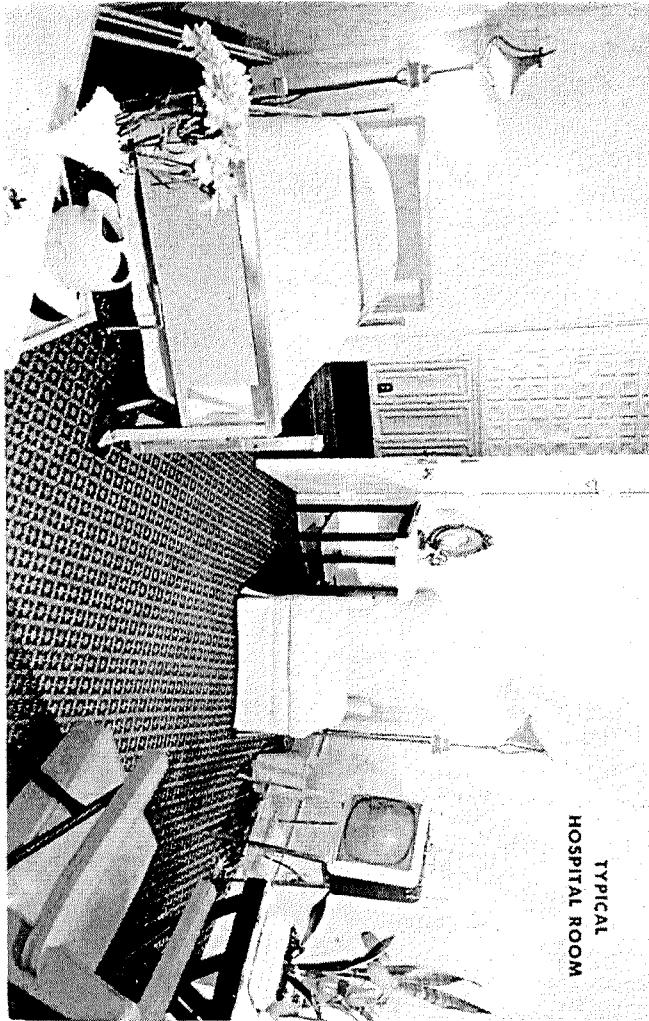


28. Sink unit with domestic wallpaper border added around it.



Bed steps in the process of being replaced for health and safety reasons.

29.
An attempt at domesticating a hospital room, 1960's, Museum of Fine Arts, Boston,
USA.





30. This surgeon's stool is used by a midwife or consultant to deliver a baby. Its stainless steel aesthetic evokes the same clinical feel as the surgeon's tools. Some women found this piece of furniture particularly raised their anxiety levels.



31. Small rooms were set aside for the initiation of breastfeeding, yet the furniture was known to be inappropriate by the staff: seats were too high, vinyl upholstery was sticky and the leg rests were all of inappropriate height and position. The breast pump had a particularly unfriendly aesthetic, Manchester, 1999.

Two independent visits were made to this hospital under the guidance of Anne Greer (see Specialist Expertise 5). The first visit included a comprehensive tour of the hospital, including a tour of the service wash facility which would invariably have implications on the upholstery covers of breastfeeding chairs. *The Special Care Baby Unit* was the focus for the second visit.

Furniture Observations:

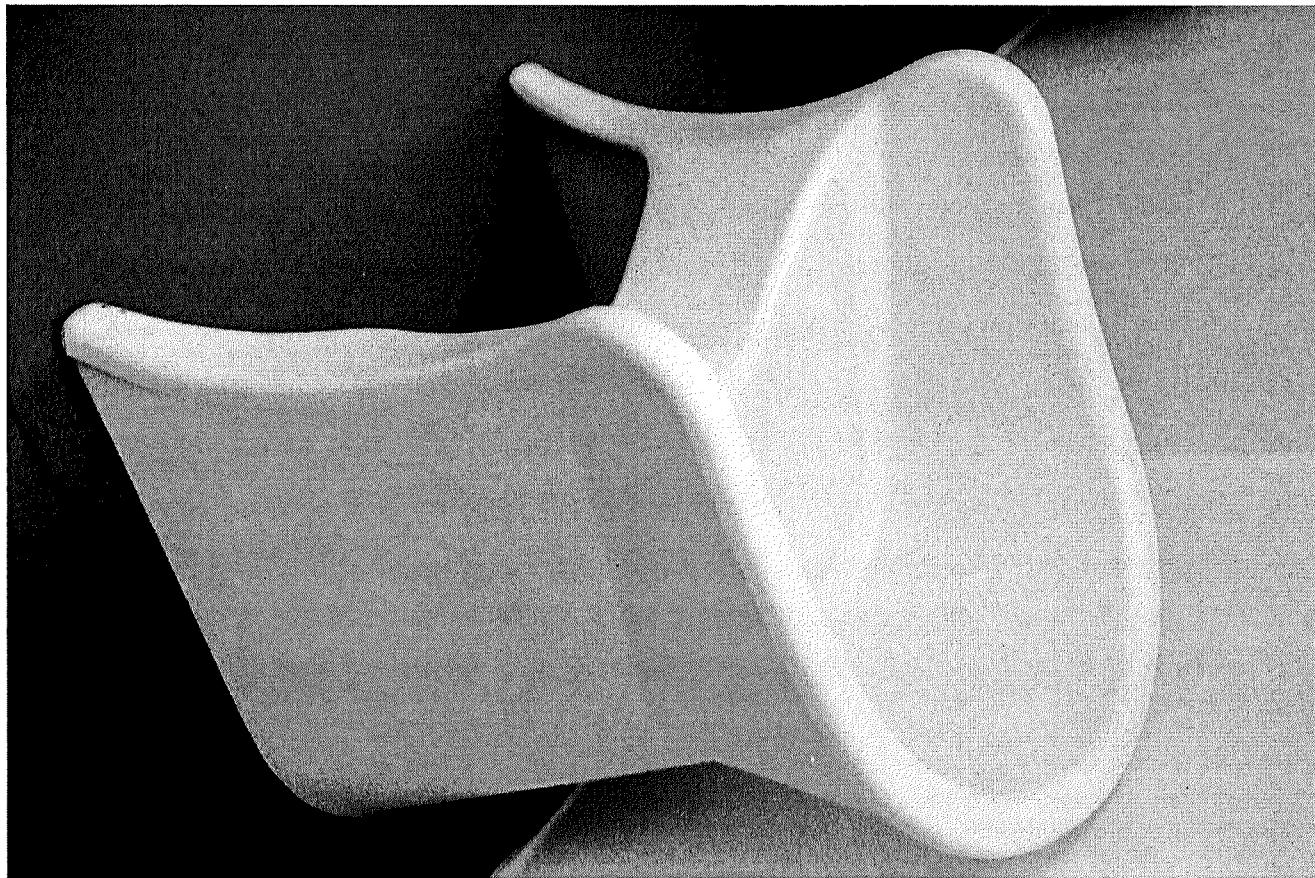
In the *Special Care Baby Unit*, (SCBU), I was shown a chair, which the sisters in charge had received, on a seven day trial from a manufacturer. The manufacturer claimed this to be a breastfeeding chair specially designed for the purpose. It was rejected on the day it was received on the grounds that it was too high, made of rigid moulded plastic and had, high, hard, solid arms which restricted the movement of the mother (see Fig 32). I immediately recognised the chair as the one photographed at the *Moto* motorway service station (see Fig 46).

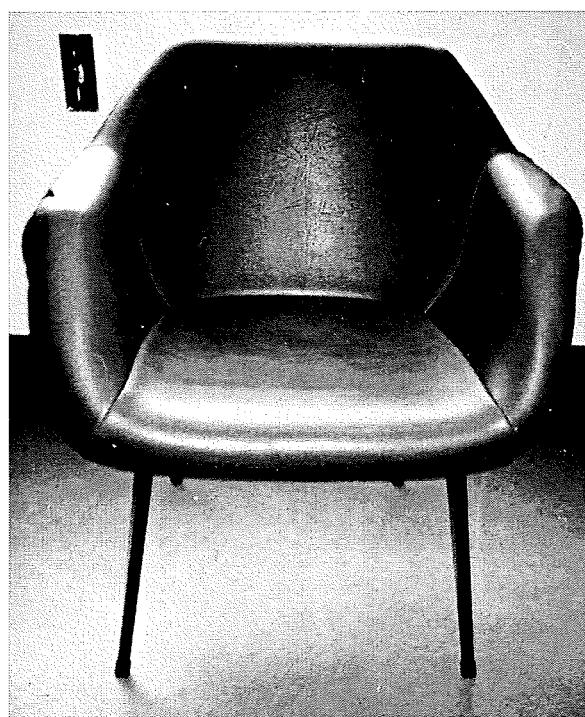
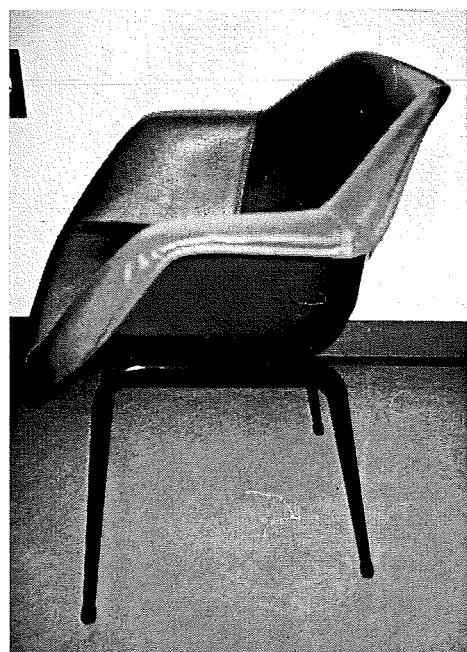
They showed me another chair, which they claimed to be more successful in enabling mothers to bring their infants to the breast and breastfeed successfully and in comfort. This chair was particularly useful in the SCBU as the mothers needed the support of low arms with premature babies who would need to be lifted higher than usual to reach the breast, being so much smaller than full term babies. This chair had been designed by Robin Day in the 1960's (Fig 33). The upholstery had been added at a later date by the hospital. When I sent a photo of the chair to Robin Day he informed me that although there was originally a version with an upholstered pad on the seat, it was never manufactured in the form observed here (i.e. as a fully upholstered chair). Stacked telephone directories were sometimes used under the feet of the mothers to lower the seat height of the chair thus raising the lap height of the mother.

3.4.6 Summary of Furniture Observations: Site Visits

Of the five sites visited, only one of them was not attached to a hospital: *The Baby Clinic* at *Thame Health Centre* in Thame that is part of the doctor's surgery. It is interesting to note that the ambience here seemed more informal than at the other sites. The furniture seemed to be arranged in a more domestic manner, partly because the clinic is used for other activities at other times during the week so very little of the furniture and equipment seemed specialist in nature. There were more pot plants around and a magazine holder containing plants, designed and made by a local cabinetmaker was the central focus of the area. The chairs were very basic polypropylene chairs like those common in schools, but did have the advantage of being easy to move and to stack. One disadvantage of the baby clinic sharing the space of the doctor's surgery was that few people are ever seen to breastfeed there, probably because it is situated in quite a public waiting area. At the *Infant Feeding Centre* in Oxford, it is far more likely that you will see

32. Chair on a seven day trial by Gloucestershire Royal Hospital, rejected and re turned on day one of the trial period.





33. Glass fibre (later polypropylene) chairs by Robin Day, 1960's. Upholstered by The Gloucestershire Royal Hospital staff for their special care baby unit, where they are still used today to help new mothers initiate breastfeeding with premature babies.

women breastfeeding less modestly as it is located apart from other areas of the hospital. The furniture at this clinic in Oxford is more socially arranged, some around a television, other chairs scattered around the room.

The furniture at *Stoke Mandeville Hospital*, at *Stockport Maternity Hospital* and at *Gloucestershire Royal Hospital* was much more like stereotypical hospital furniture in its style. The extraordinary efforts some of the midwives had gone to in order to adapt the furniture were most memorable from these sites. From Chloe Fisher's sawn down chair legs to the adapted commode at *Gloucestershire Royal* these women and these chairs showed incontestable evidence that furniture needs designing and that almost all furniture presently in use is inadequate.

The furniture observations made during all aspects of the primary research inspired the following sections. Observations of chairs used for breastfeeding in the home – sofas, single chairs and stools for example were used to signpost the research into existing chairs. The section that follows begins by investigating the concept of the nursing chair first, then selected chairs are used to illuminate characteristics of chairs currently used by mothers to breastfeed in. Clues are searched for to the design criteria needing to be established. The term *nursing chair* is widely used today when referring to chairs used by breastfeeding mothers. The debate begins therefore by defining this concept.

3.5 Research Observations: Survey of Relevant Furniture

3.5.1 Task Chairs and Breastfeeding Women

What is a nursing chair?

Nursing chair a term sometimes applied to virtually any low-seated chair, whether or not designed for a nursing mother.²⁸

This dictionary definition epitomises much of the difficulty encountered in the survey of furniture designed for or primarily intended for the purpose of breastfeeding. Any attempt at this history is largely based on myth and hearsay. Books on the subject do not exist and very little other than anecdotal evidence exists with which to construct a picture. Despite an extensive search of the following institutions, archives and authors, texts dedicated to breastfeeding chairs were not found. The main sources of my enquiries into the history of furniture for breastfeeding were:

²⁸ *The Antique Collector's Dictionary*, Hamlyn, (1979), p.173

- The Victoria & Albert Museum, London
- MODA: The Museum of Domestic Architecture, Middlesex University
- The Parker Collection, London Metropolitan University
- The Wellcome Trust, London
- The Geffrye Museum, London
- The Women's Library, London (new, opened 2002)
- Sheila Kitzinger's own archives, Standlake, Oxon
- Germaine Greer's own research
- Private Collections (see 3.2)

Surprisingly, the *V&A* have neither archival material on the subject of nursing or breastfeeding chairs, nor do they have any nursing or breastfeeding chairs in their collections. *MODA* were able to provide me with some material, although it was all of Twentieth Century origin. Even so, only two illustrated examples of chairs for breastfeeding could be identified, with other examples of *nursery chairs* or *slipper chairs* adding some speculative interest as to whether they really were intended for use as breastfeeding chairs. *The Wellcome Trust* had some useful archival material about formula milk and the design of containers for it but nothing about chairs used for breastfeeding. Neither *The Geffrye Museum* nor *The Women's Library* could find anything in their archives and despite their generous searches, and neither Sheila Kitzinger nor Germaine Greer found any examples of furniture acknowledged to be for breastfeeding use. Birthing furniture however, and in particular stools, can be commonly found in India and parts of Africa.²⁹ I was particularly lucky to come across a pair of stools allegedly used for breastfeeding by women in Cameroon (present day) which are owned by an anthropologist interviewed for the thesis in August 2002 (Fig 34). Hence it is largely with the help of paintings, early photographs, a few literary sources and the material mentioned above that a history of what is perceived to be the nursing chair can be constructed.

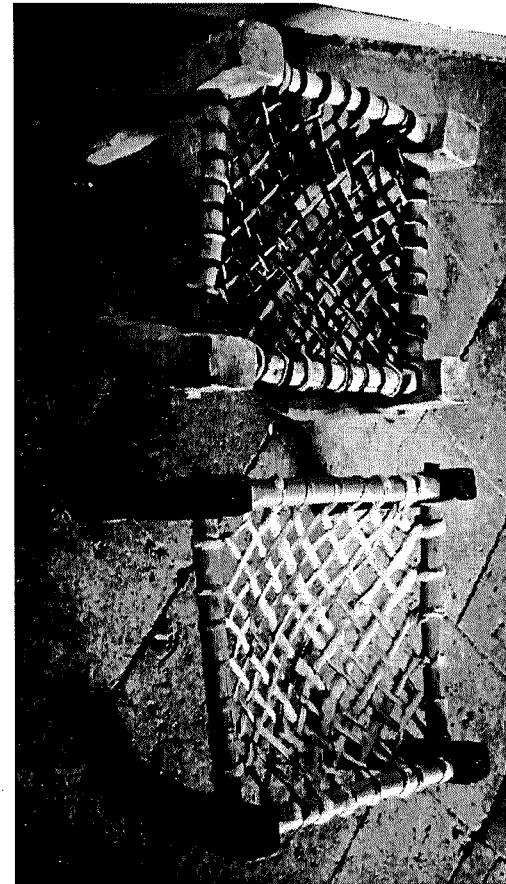
One difficulty in defining what is meant by the term nursing chair, as raised earlier (1.3: Conclusion to Chapter 1) is the controversy surrounding the attributed function, often described by an assumed name given to small chairs, particularly during the Victorian era. For example, evidence suggests that labels like *fireside chair*, *ladies chair*, *nursing chair*, *bedroom chair* and *slipper chair*, are given to book illustrations by authors, which should be treated with some

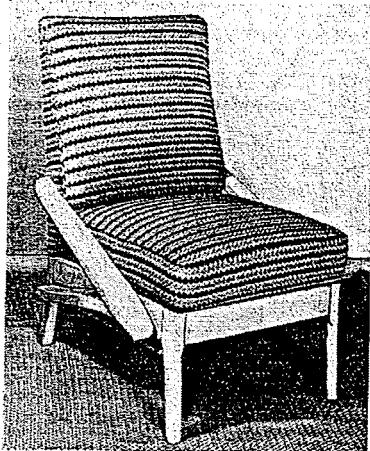
²⁹ Kitzinger, S, interview with the author, at her home in Standlake, Oxfordshire, (23/11/00)

34.

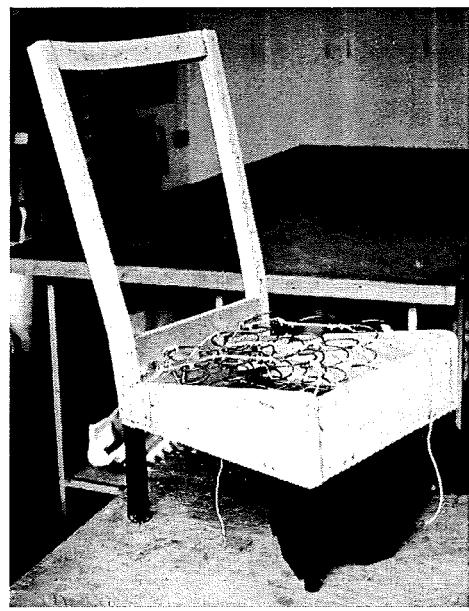
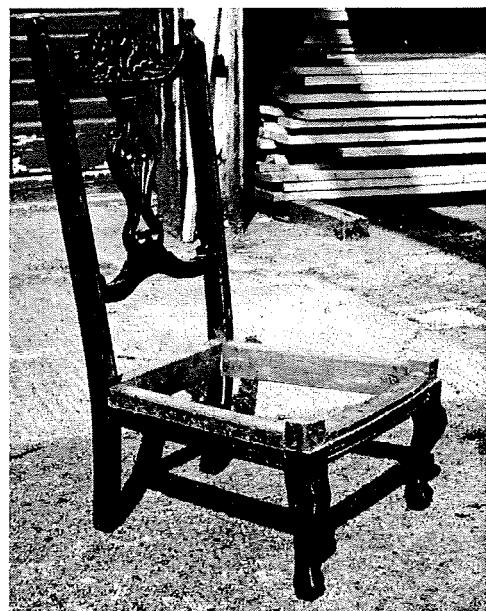
Breastfeeding Stools, Africa

These stools encourage the closeness of siblings and the communication between mothers, Cameroon, 2001.





Above—The "Oslo" chair from Horace Holm Ltd. has two-way arms specially designed for women who like to knit or sew.



35. Labels such as *lady's chair* and *nursing chair* should be treated with caution.

caution (Fig 35). Alternatively, chairs are described as 'the curiously low chair on the right'³⁰ or 'nursery chair' making no attempt to suggest a specific function. Although early nursing chairs allegedly were designed for a woman to 'nurse' references to anyone having *designed* specifically in response to this activity are few and far between.

Victorian chairs commonly known as *nursing chairs* were chairs that came to represent the *role* of nursing rather than the *function* of nursing. A wet nurse rather than the biological mother probably defined this role. The two chairs illustrated in Fig 36 are described as *ladies chairs* by their owners but might indeed have been thought of as *nursing chairs* originally, due to their low seat height and small size. One explanation for these chairs having no arms was that the trusses worn by Victorian women needed to be allowed for in the design of the chair.

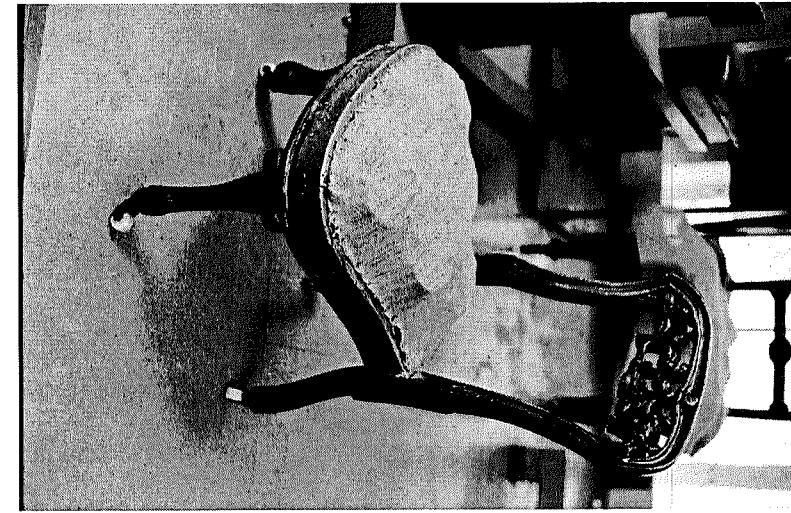
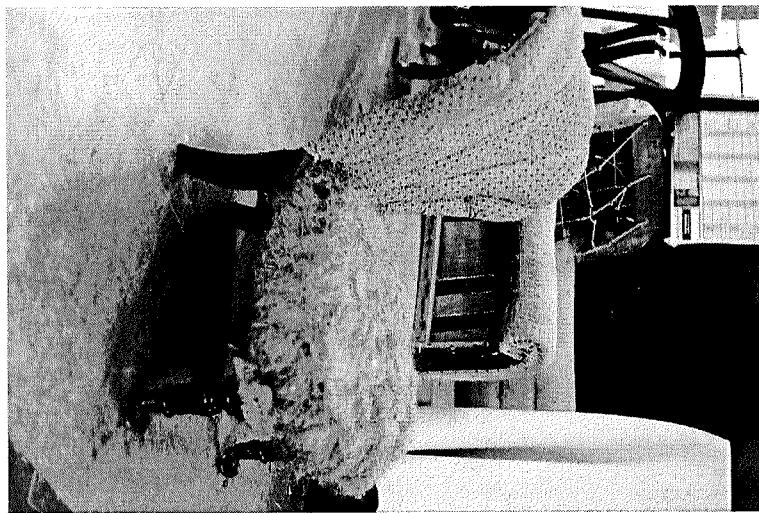
As suggested in Chapter 1, the implications of this on domestic interiors and on furniture design could provide significant clues to why Victorian nursing chairs were typically deep buttoned and expensively upholstered and took pride of place in middle and upper class homes. It is my belief that the nursing chair was intended for the wet-nurse, not actually the mother. Hence in purchasing the chair, or by commissioning one to be made, the family were *exhibiting* a piece of furniture, as is known to be the case with many other pieces of that period for the purposes of status. Thus it became a statement about their financial standing, or about how expensive a nurse they could employ, rather than a chair having anything at all to do with any real consideration of the nurse's comfort or ergonomic satisfaction. These chairs were token gestures symbolic of some domestic ideal or status, not designed for breastfeeding at all. Design evidence is scarce because it was actually never addressed. The way these chairs were named indicates a deliberate reluctance to admit to their intention for use with names being attached to chairs we now assume to be nursing chairs, particularly during the Nineteenth Century.

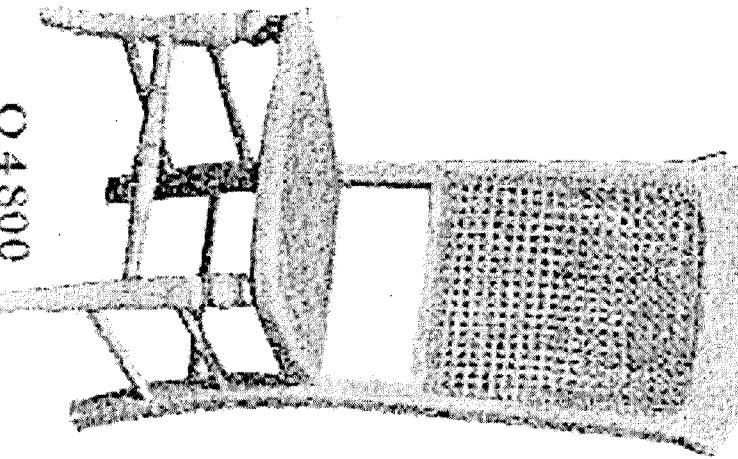
Nursery chairs, like the one illustrated in Fig 37, tended to be put in the nursery and used there, which leads to a key question: was the intention that children or mothers use them? Both the height of the seat and the angle of the back appear to be conducive to breastfeeding but is this really deliberate? This is doubtful: it seems much more likely that this chair is intended for a child to use. For example, according to a typical source:

Unless he has a nanny he will still be spending most of his indoor time in any room near

³⁰ This is a reference made to a chair in *Antiques and The Home*, by an unknown maker at The Russell Workshops Ltd., Worcestershire, which appears to have the dimensions required of a nursing chair, Marshall & Cavendish, (1986)

36. Lady's chairs, BCUC, 2002





37. *Nursery chairs: were they for children to use or for mothers to use?*

his mother while she works, so his own room still only needs to be furnished with a cot, chair and clothes cupboard.³¹

So then a chair as in this situation often has an ambiguous role and we are unable to determine whether it was intended for use by the child, the mother or the nanny.

3.5.2 Twentieth Century Chairs and Breastfeeding Women

The few nursing chairs known to have been designed for the purpose of breastfeeding have been designed during the Twentieth Century.

During the 1940's Doris Young, who having been noted for 'always paying attention to the needs of women as consumers'³² designed a chair for *nursing* mothers:

Her career as a designer is also of interest, not least in terms of gendered design. She has always paid attention to the needs of women as consumers, including the need to keep dusting to a minimum. One of her designs, for instance, was a chair for nursing mothers specially developed for the *City of London Maternity Hospital*³³

Keeping dusting to minimum and designing a chair for nursing mothers are disappointingly here given the same status. The fact that this chair is described as being later transformed into a television chair corresponds chronologically with the decline of breastfeeding rates during the 1950's. Despite ongoing searches, during the course of research I was unable to find any evidence about the existence of this chair, any illustration of it, or the terms of its research and development.

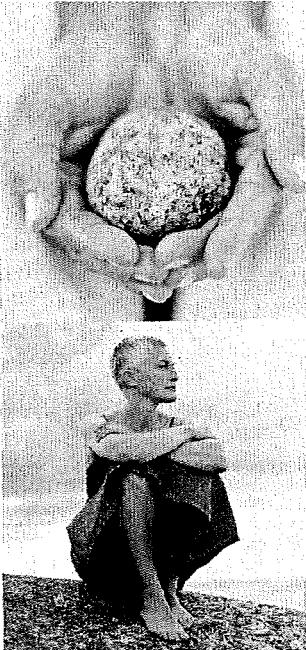
The term *task chair* is commonly used to describe chairs used in office environments (Fig 38). What does seem clear is that chairs for breastfeeding have never enjoyed the significance or perceived usefulness of other chairs designed for tasks. There may be a question of gender at issue here of the kind picked up by Crantz when she argues:

³¹ Gray, R, *The Daily Mail Ideal Home Book*, (1950-51) p.100, source: MODA-Museum of Domestic Architecture, Middlesex University archive, (2002)

³² Kirkham, P, *A View From The Interior – Women and Design*, The Women's Press, (1989), p.127

³³ Ibid, p.12

Ergositter – the new seating concept
that lives up to its name



Does your back feel more comfortable when you work standing up? Well, now you can sit down to work in comfort without developing back trouble. Ergositter is a unique office chair. The rear section of the chair's seat can be lowered to offload your back completely, thus counteracting injuries caused by back strain.

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38. The substantial investment in ergonomic office seating could be better directed. How many more office chairs do we need?

The substantial investment in ergonomic office furniture could possibly be better directed toward inventing an entirely new system to promote movement at work and at schools, for example.³⁴

Indeed it appears that because men don't need them (and most people in positions to influence manufacture are still men) investment in research and development in this field has been virtually non-existent. Some of the design complexities surrounding the production of a breastfeeding chair are illustrated by the response to the 1950 production by *Scottish Furniture Manufacturers* of 'a comfortable nursing chair'. In the same year, Ruth Gray writing about it for *The Daily Mail* explains:

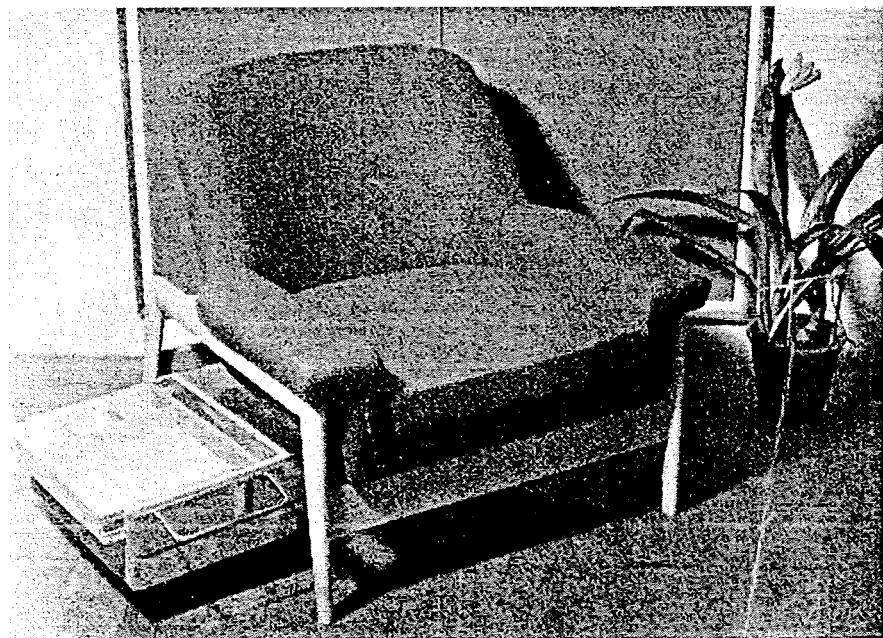
As a new mother myself I know the mistakes so many of us make when planning the nursery to be. One is so bemused by sentiment that the tendency is to choose pretty-pretty rather than the practical. I have not included a nursing chair among the minimum necessities because one can do without one, but in my experience few normal chairs are tilted at a restful angle for feeding baby and at the same time low enough for the mother to feel him secure on her lap. Searching for a good nursing chair that would look at home in the living room, I have found a very useful one, which is illustrated...³⁵

Gray, as a mother herself, interestingly enough at first denounces the need for a nursing chair only to contradict herself by then pursuing a critique of current provision. Sadly though, the model favoured by Gray does appear, in retrospect, far from perfect: the seat height appears to be low on the example illustrated and the angle of the back appears to be too obtuse to satisfy the required position for breastfeeding. The tray swinging out from beneath the seat is nevertheless placed with ergonomic sensitivity and the chair at least demonstrates that someone at *Scottish Furniture* took a decision to put it on the market so believing it to be both needed by the consumer and commercially viable (Fig 39). To date there is no further information about the designer of this chair or about its popularity.

So who decides whether breastfeeding furniture is needed, either for the home or for public places like cafes or workplaces? If more women breastfed then there would, one would hope, be more demand for furniture that facilitates doing it, and so consequently more manufacturers to produce and market it. As seen earlier, some people take the challenge in their own hands and

³⁴ Cranz, G, *The Chair*, Norton, (2000), p.18

³⁵ Gray R, *Daily Mail Ideal Home Book*, (1951), p.101; source: MODA, Middlesex University archive, (2002)



39. Breastfeeding chair, *The Scottish Furniture Manufacturers*, 1950. Ash frame, Dunlopillo upholstery foam, upholstered in Scotch Tweed fabric.



40. Breastfeeding in a toilet cubicle is a common though unrecognized everyday scenario - can one conceive of a less comfortable or less hygienic place?

build their own. But is the problem really one of numbers or is it the result of patriarchy and taboo? The taboo surrounding the subject seems so powerful that even when breastfeeding is a regular activity for a woman, she will often scurry somewhere for privacy. She will be embarrassed and worried about offending people and will often end up feeding in a toilet cubicle (Fig 40).

Today, more public places are being designated as places where it is acceptable to breastfeed: some cafes exhibit stickers on their shop windows proclaiming them to be 'breastfeeding friendly' or 'OK' to breastfeed here' (see Fig 41). However, places designated for breastfeeding women remain few and far between and it is a relatively new phenomenon to provide them.

Besides clinics and homes where else should breastfeeding chairs be provided?

As discussed in Chapter 1, politically, breastfeeding in public globally is full of contradiction, with New York having only repealed the law which forbids it as recently as 1994, and California, birth place of *Baywatch*, still maintaining it's outlaw. It remains illegal to breastfeed in public in California. *The Observer's Escape Guide for New Parents* summarises global attitudes and warns:

Think before you breastfeed in public. Cultural differences vary around the world.
Scandinavian countries are relatively relaxed about it but it could land you in jail in parts of the United States'...³⁶

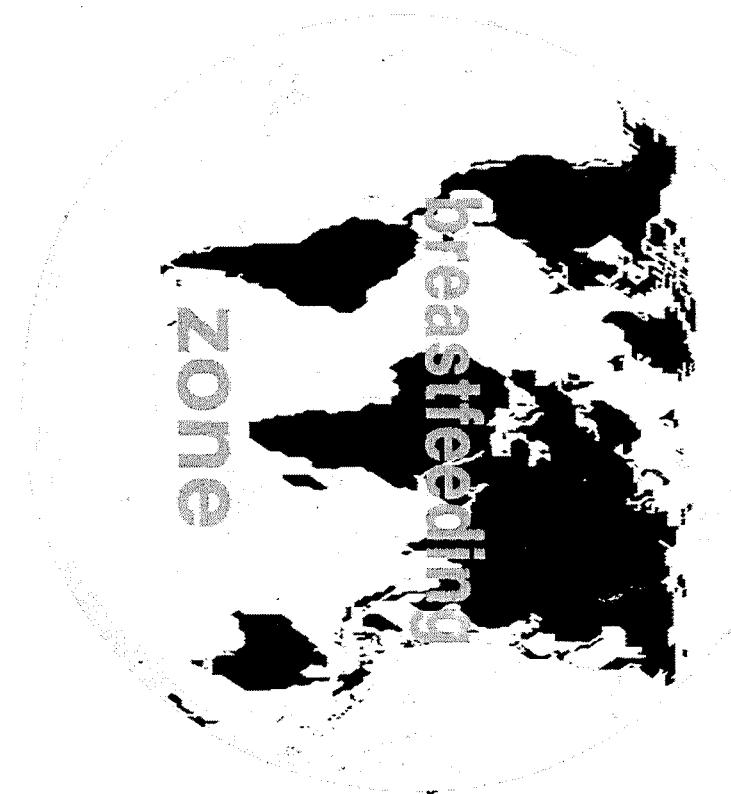
It is clearly a contentious issue. Many men admit to feeling embarrassed when they see a woman breastfeeding a baby, yet regularly they buy *The Sun* for its quick fix titillation³⁷ (see Fig 42). Even more absurd for the same reason seems the second image in Fig 43: a woman is employed in a night-club to decorate the tables by lying naked underneath the glass tops. As discussed in Section A, it is difficult to define why perhaps people might have evolved an anti-breastfeeding view. One explanation here might be about the perception of breasts as decorative and sexual objects: when breastfeeding, a woman's breasts are not viewed as such and are therefore perceived to be distasteful.

Design that helps men support their partner's activity is almost non-existent. Obvious strategies like *Mother & Baby* rooms located within or alongside ladies toilet facilities do not encourage fathers giving their babies expressed milk or needing to change a nappy whilst shopping.

³⁶ *The Observer*, May 14th, (2000), p.9

³⁷ *The Sun*, Mon. 24th Feb. (2003), p.3

41. 'Breastfeeding Zone' sticker displayed in the window of a café in Thame, Oxon, 2002.





42. Quick fix titillation: The Page 3 phenomenon.



43. Naked women are employed to decorate the tables in a nightclub in Tokyo, 2000.

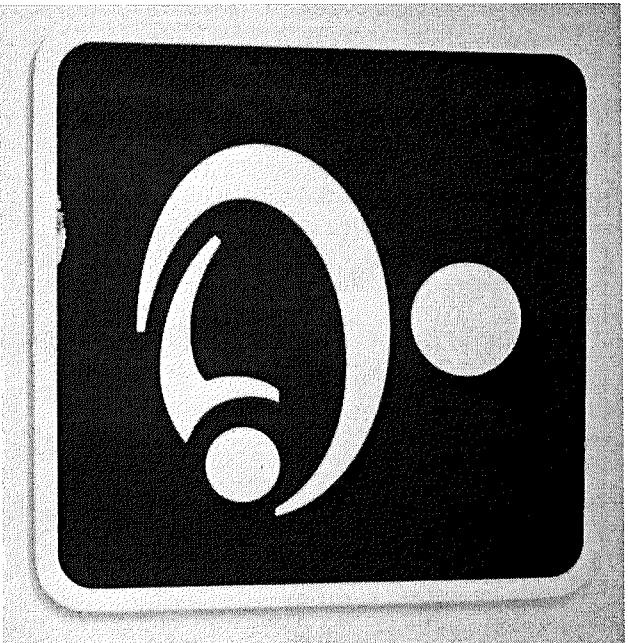
Although some of the new shopping outlet type centres do seem to recognise that such facilities are used by both men and women and so provide a room located in between the gents and ladies facilities, most large supermarket chains - *Tesco*, *Asda*, and surprisingly, *Mothercare*, do not. *British Home Stores* has an independent room for feeding and changing with a symbol on the door suggestive of a woman feeding. It is ambiguous whether or not she is bottle-feeding or breastfeeding, provoking no stigma in favour of either feeding method which seems a diplomatic decision (Fig 44). The real problem with this sign again is that it is aimed at only women and is sited nowhere near the men's facilities.

At the *Moto* motorway services the problem is worse (Fig 45). Bottle-feeding continues to be aggressively promoted, with free bottle warming facilities and offers of baby food blatantly pasted on notices in frames around the room. Furniture is provided: changing table surfaces that flip down conveniently from the wall (clearly changing a nappy is not the socio-political minefield that breastfeeding is). The chairs that are provided are all made of injection moulded, pale blue, plastic. They are questionably sited next to the toilet (Fig 46) and are eminently cleanable, hoseable even. Yet they are completely inappropriate. They possess many of the material qualities abhorred by women interviewed as case studies for this thesis: they are cold, too high, too big and too plastic, yet there they are asking to be sat on, cynically pretending to be breastfeeding chairs. This chair is identical to that which the senior midwife at *The Gloucestershire Royal Hospital's Special Care Baby Unit* trialed for the manufacturer and returned after one day of use due to its 'poor design'.³⁸

When designing chairs for people who breastfeed we need to know the users and understand them, what they do, how they feel, how they move and so on. **Breastfeeding mothers must adopt or adapt chairs to breastfeed in as none designed for the activity currently exist.** Chairs and sofas discovered in the homes of people initiating breastfeeding and interviewed for this study share similar dimensions: *DFS*, *Furniture Village*, and many typical commercial retailers, bombard us with stereotypical three-piece suites. Go into any high street furniture store and you will see them – large over sized, heavily stuffed, over expensive chairs and sofas. There are infinite styles (Fig 47). Most were found to be at the root cause of many early breastfeeding-positioning problems.

Other more 'stylish' chairs cause similar problems because of their size. Despite the success of *The Balzac Chair* designed by Matthew Hilton in 1991 for example, I remain unconvinced of its usefulness and would challenge anyone, male or female, under 5'5" tall to not feel like a small child as they slide, (particularly in the leather version) into a horizontal position in this immense

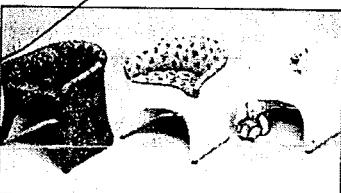
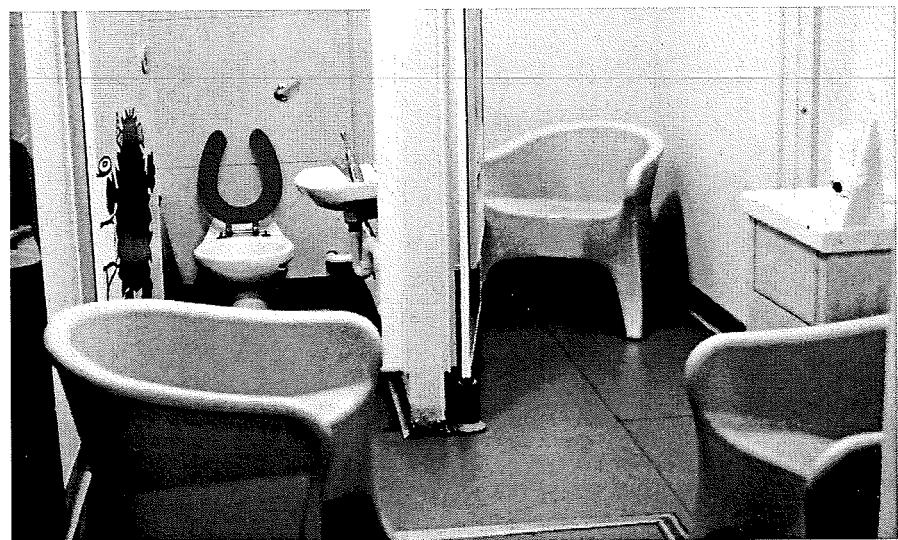
³⁸ Greer, A, interview with the author, (Aug 2000), Royal Gloucestershire Hospital, Gloucester.



44.
Positive door signage.

A black and white photograph of a motorway service station interior. In the foreground, there is a white rectangular sign with a black border and the words "private feeding room" in white. To the right of the sign, there is a circular graphic featuring a cartoon baby bottle-feeding. Below this graphic, the text "how we care for families" is written vertically. Underneath this, there is a section titled "Baby feeding" with the following text: "Free Organix baby food nappies and baby wipe 125ml Steribottle, bibs, Safe bowls, spoons, us and bottle warmer." At the bottom left, there is another section titled "Parent and baby room" with the following text: "We have newly refurbished parent and baby facilities to take the stress out of travelling with young ones. Look for the parent and baby change room sign where baby can be fed and changed in privacy."

45.
Motorway services, UK, where bottle-feeding is aggressively promoted.



As seen on TV

The new unique curvy designed by Mike Pierce for maternity departments starred in the BBC's "Home Front" programme.

In a dramatic transformation of a Hospital's neo-natal care unit, the BBC required practical furniture which fitted in to the new surroundings. The fully upholstered Curvy chair was an obvious choice.

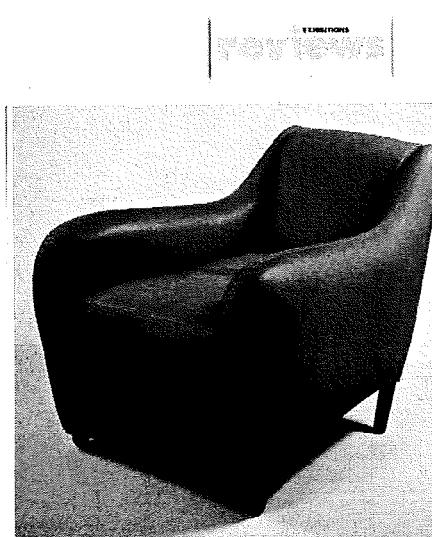
The chair can be ordered in three different upholstery versions as shown. The chair is featured on page 10 of Renray David Baker's new catalogue.

46. Injection moulded PVC maternity chairs, Moto motorway services, UK.

The same chairs were launched on the BBC's *Home Front* television programme as 'new unique curvy designed chairs for maternity departments.'



47. A familiar sofa, DFS, 2003 .This kind of sofa causes breastfeeding women positioning problems.



Hilman's achievements in this area. Updated continually by contrast, it is clearly a field in which he has triumphed. His most recent being the related, very well considered *Balzer's wheelchair* (1971). Other pieces on this theme include the east-pedalized *Moray wheel* and *Oscar's wheelchair* (1969) for Dibley, which score three lines of merit. The one in this is played towering high. Again it would have helped to have seen a wider range of designs, such as the armchair-based Easy-chair (1972) and the Skidley-chair (1972), both of which are at an interesting level in the exhibition's hierarchy.

Hilton, manufactured SCP, leather
the greatest of the exhibition's lots.
Hilton's carpet would easily
be worth at least \$10,000.
Admittedly, space in
the Griffey-McNulty gallery is
limited, so the pieces have
been displayed differently; one piece,
for example, has been displayed
as the exhibit as could have
expanded to an inspiring room.
My main gripe, however, was the
advice of the trustees. Shaking the
hand of a trustee, however, is
not a good idea if that person
is a trustee. However, I did
shake hands with the
trustees of the Griffey-McNulty
Art Foundation.
Authorities (79) had asked for
example, had virtually everything
displayed during the show.
The show was a success.

disadvantage in aesthetic point of view was that the decision to display the furniture in specially constructed cases, as well as preventing visitors from viewing objects in the round, some of these exhibitors were so compelled that the exhibits were semi-obscured.

Matthew Hilton deserves to be in the limelight, and I am glad that he has been honoured with a solo show. Twenty years from now, though, when the time comes for his next retrospective, he's going to have even more space to breathe, and given a more sensitive approach to the exhibits in institutions like this.

GWINN HENKINS PIGOTT
Gordon Ernest, 1915-2006
Wife: Mary W.H.
Born: Jan 15, 1915
Died: Dec 10, 2006

Gwen Hynne Piggott, formerly Gwynn Henkens, died Saturday, December 10, 2006, at the age of 91 years. She was born in New York City, the daughter of a Congregationalist minister, in which she had been in the parsonage during her childhood. Her parents moved to a small town in upstate New York where she grew up. She graduated from Cornell University in Ithaca, New York, in 1937. She taught high school teacher education. What was unusual for the first few years of her teaching career was that she taught in one-room schools, and of reading in one-room schools, was her specialty. There has been a preference for single teachers, mainly in rural areas, ever since the days of one-room school buildings. Along with her more than twenty years, she has also worked for many years in a preschool program, and has also taught in one-room schools.

and analysis of behavior, based on the assumption that people act rationally. Smarter, more intuitive groups, perhaps because they can think and imagine well, find it easier to learn, and are the most successful of these groups. Simple levels showed Pigalle's participants doing this, but also other questions, leading to the realization of the effects of time, or the trade-off decisions of finance – a choice in this case, depending on the ratio of the gains, requires initial light, short-term investment, and long-term, more slowly crystallized and effective.

48. The Balzac Chair, by Matthew Hilton, 1991. Is ergonomically too big for most women.

and opulent seat. 5'4" is the average height of women in the UK: is it not reasonable then to suggest a flaw? (Fig 48)

It may well be that Hilton's *Balzac* looks more stylish than its competitors, but it is equally certain that for most women *The Balzac* is not comfortable. Style does not equal comfort. These chairs suggest that reclining equates to comfort and relaxation. The problem is compounded for breastfeeding women who assume that successful breastfeeding will consequently be achieved using large and squishy sofas. Style alone will not design a successful breastfeeding chair. We need to look beyond style to the user. Therefore, observing women breastfeeding, drawing women breastfeeding, photographing, filming and measuring women breastfeeding and recording what they actually do within the spaces they inhabit will be our greatest informer. The study of people is imperative for a designer, particularly a chair designer, yet daily we can find examples of furniture designed in ignorance of the user, leaving Norman, in despair to write:

I urge designers to study people...and show why even the best trained and best motivated designers can go wrong when they listen only to their instincts instead of testing their ideas on actual users.³⁹

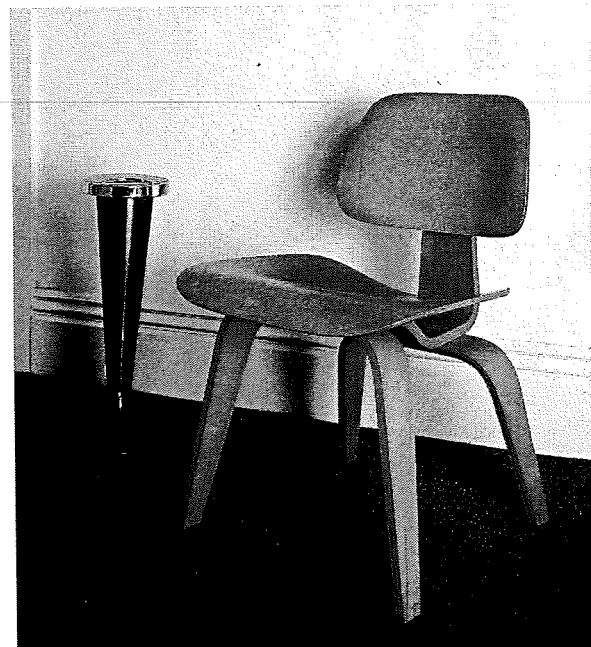
Critically appraising these large armchairs and sofas offers an insight into the problems of design and allows us to develop a series of useful critical observations, which could be summarised as follows:

- **Aesthetics need not be sacrificed for usability**
- **The study of people i.e. the user is essential to the design of a functional chair**
- **Many typically large armchairs cause difficulties for women who are trying to initiate breastfeeding**
- **Many typically large armchairs are designed by and for men, despite their advertising which almost invariably depicts women making use of them or stroking them**

Form and function seem to dominate our appreciation of objects for use in our homes yet it is the application of materials that comes first. Wood, metals and plastics dominate the landscape of the products that have come to shape the late Twentieth and early Twenty-First centuries.

The chair illustrated in Fig 49, the *L.C.W: lounge chair wood*, designed by Charles and Ray Eames in 1945, is remarkable for its low seat height: 370mm high at the front of the seat; 290mm

³⁹ Norman, D, *The Design of Everyday Things*, MIT Press, (1998), p. vii



Eames Molded Plywood Chair

49. L.C.W by Charles and Ray Eames, 1945. With minor adjustment, this chair could ergonomically function as a breastfeeding chair.



50. Dining or occasional chair by Robin Day, 1950's, with latex foam upholstered seat.

high at the back of the seat (Fig 49). This chair, unlike those large over stuffed armchairs however, does support the body exceptionally well and although a pillow behind the back would be necessary to bring the angle of the back forwards, breastfeeding in this chair works because it is low and supportive of the body.⁴⁰ Recognising the different proportions of people and different requirements of the height of a chair dependant on task, it is one of few to be offered in more than one height. Later in Chapter 4, the justification for proposing more than one height for the breastfeeding chair to result from this study will be described. In the case of the *L.C.W.*, the different heights relate to the functions of dining as opposed to lounging. According to Charles Eames' grandson, Eames Demetrios, the differing heights for these functions came not from an assumption about what was required, but from very careful observations of how people behave in the two scenarios of dining and lounging.⁴¹

The cost of these two chairs is not without interest. *The Balzac Chair* costs £2700.00 - a testimony to the high price of fashion and style. The *L.C.W Chair* costs £650 and is distributed in the UK by *Vitra*. It cannot be disputed that this is a very comfortable chair when used appropriately, let's say as a lounge chair or in a reception area of an office. However, it is relatively low and still 'too hard' on the bottom for some. The most important thing that negates the use of this chair by most people though is it's cost. Despite the fact that it was designed by someone who is now heralded as one of the most famous and talked about furniture designers of the Twentieth Century, this cost really cannot be justified for it's iconic status alone. This keeps it out of an affordable range for most consumers. In production terms, the materials and processing costs of this chair add up to approximately £100 per unit, depending on the kind of moulds used and the lifespan of the moulds. As a comparison if we look at the chair illustrated in Fig 50 designed by Robin Day, working with comparable processes a little later in the 1950's in the UK, we see a similar investment in the development and production of a chair using timber lamination as does the Eames *L.C.W. Chair*. Yet this chair retails today at £130: only 25% of the current retail price of the *L.C.W.* (Fig 50) (There are of course less laminated components in the Day chair. Also the steel rod legs are cheaper to produce than laminates but the addition of an upholstered seat may bring the costs for the two chairs more in line with each other). At 87 years old, Day is still very much alive and actively designing things, whereas Eames is not - perhaps it is this retrospective admiration and respect for talent, as with most famous but dead artists, that commands such high prices? For my own purposes primary research has indicated that the cost of the breastfeeding chair needed to be kept relatively low so that clinics and women from less affluent parts of the country could afford it. The most interesting observation to bring me to these

⁴⁰ Chair owned by the author was tested for breastfeeding suitability with a breastfeeding woman (2003)

⁴¹ Demetrios, E, interview with the author, *Ergonom* showroom, London, (15/2/02)

mid-Twentieth Century chairs however, particularly those designed by Robin Day and Charles Eames was a realisation of their presence in the lives of breastfeeding women today.⁴²

Amongst these mid-century chairs, many of which are now anonymous as opposed to iconic, I discovered a wealth of rich inspiration for the design of breastfeeding chairs. For example, many of the upholstered armchairs have steel rod or tube underframes, making them lighter in weight, many have washable, removable covers, and some with their winged high backrests and low seat heights, had been made to function as breastfeeding chairs with minor adjustment. The following section considers some of these chairs in search of characteristics useful to the design of a dedicated breastfeeding chair.

During the 1950's and '60's breastfeeding in the UK was at an all time low and yet ironically, in retrospect many commercial chairs of the time, those designed by Eames, Day, Howard B. Keith, Ernest Race, A.J. Milne and H.J. Perkins for example, though unrecognised for being so, would have functioned well as breastfeeding chairs. They were often of the appropriate seat height (350mm) with well-sprung seats and erect curved back rests. Loose covers were fashionable. Some chairs that were seemingly designed for women were designated as *the fireside chair*, *the bedside chair* or *the sewing chair*. Some journalists at the time even described them as being designed to fit the feminine shape. Yet most significantly, it was a time when it was less usual to sit in a chair to breastfeed than it was to sit in a chair to knit.

There was an unprecedented consumer boom in the 1950's, when the uncertainty of the previous decades was replaced by a celebratory attitude to what was now possible socially, politically, economically and materially. An article in *The Daily Mail, Ideal Home Book* from 1951 for example, rehearsed the social and political perspective to the rationale for the radical changes in the design of products at that time in the following way:

The public taste for colour and full pattern, that is, contrasted with the ever increasing simplicity of actual furniture, is due to taxes and regulations as much as to the hangover of functionalism. For this reason, while woods are glossy and pale, everything else is in brilliant or sombre colour.⁴³

Charles Eames, Harry Bertoia, Arne Jacobsen, Hans Wegner, Jean Prouve, George Nelson, Eero Saarinen, Gio Ponti, Carlo Mollino and Verner Panton all achieved iconic status during the 1950's, but what of Howard B. Keith, Ernest Race, A.J. Milne and H.J. Perkins? With the

⁴² A useful celebratory text is found in Cara Greenberg's *Mid Century Modern*, see bibliography

⁴³ Reeder, H, *Progress In Modern Furniture*, The Daily Mail Ideal Home Book, (1951-52) p.75, from the MODA archives, Middlesex University, (2002)

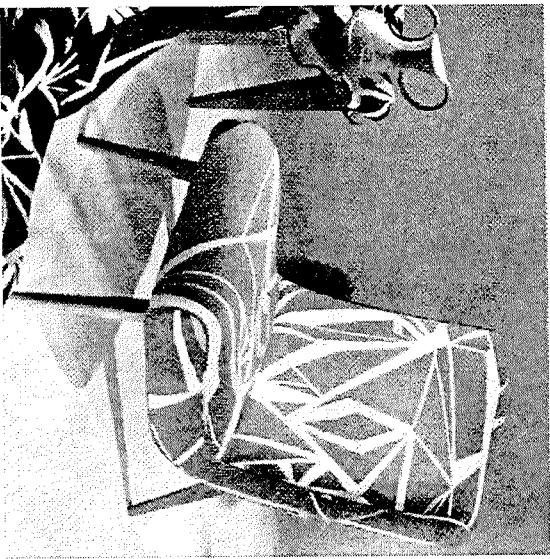
exception of Ernest Race (who like Robin Day was interested in the design of low cost furniture), most of these names remain uncelebrated, yet their chair designs during the 1950's and early 1960's touched the lives and homes of a far wider UK audience. **It was finding examples of these more ordinary chairs in the homes of breastfeeding women that inspired me to try to discover the origins of these styles.**

Although the myth of the Victorian nursing chair prevailed, I rarely saw them being used in the homes of breastfeeding women who owned one. Instead, I did find that the chairs which the sample of women used were usually post-war and interestingly were often the chair in which their own mother successfully breastfed. The first such example I came across in June 1998 was just such a case being a suitably low chair dating from 1950's (earlier, Case Study 1, 3.2.1). It was upholstered using a popular yellow and black vinyl cover and is similar to another 1950's chair of Argentinean origin that I was able to identify⁴⁴ (Fig 51). Although the design of the cover is clearly different, the form is similar: same timber framed construction, sprung in the seat and back and with fairly low tapering legs characteristic of many chairs at that time. The angle of the back is however too obtuse for the purpose of breastfeeding making this chair dysfunctional compared to the one illustrated above it. In order to make the chair function adequately pillows would need to be put behind the mother's back to allow her breast to fall forwards. What seems incredible is the countries of origin of these two chairs. It seems likely that the chair on the right originates from the UK as the user's mother stated that she bought it in London in the 1950's. The Argentinean origin of the chair on the left suggests that there was a world-wide style at the time and that although travel and communication was slow compared to today's standards, images and style travelled and similarly designed chairs came out of culturally diverse countries.

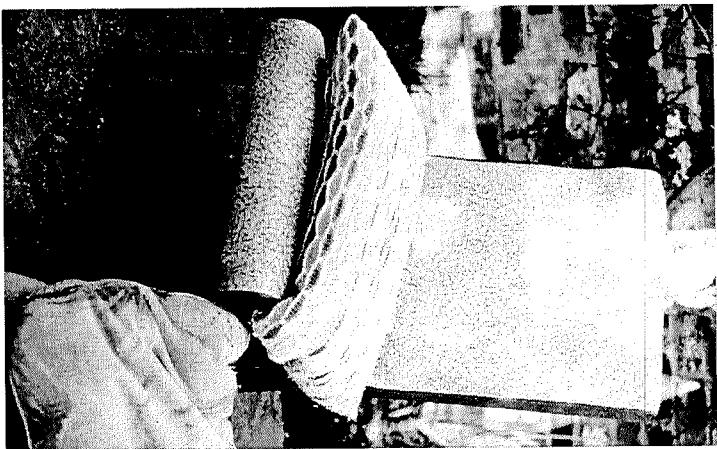
Ironically the *Bambino* chair (Fig 52) designed by Howard B. Keith, founder of *HK Furniture* in the UK in the 1950's is, in the armless version, similar to another chair found to be used by a breastfeeding woman in 2000 (Fig 55). This chair has a solid beech frame and underneath the loose box cushion it is sprung with 's' springs. This was typical of many other chairs at the time, the origins of which are impossible to recognise, as there were so many variants of this form on the market. It is the shape of the backrest that is most distinctive and seems to be derived from the winged armchairs of previous centuries. It is wishful thinking to imagine that this chair was called *Bambino* because it was designed for a mother to feed her child on and it seems far more likely to have been given the name for its relatively small stature. However it is the low height of

⁴⁴ Ibid, p.158

Chair of similar form, 1950's, Argentina.



51.
1950's chair, being used by a breastfeeding woman in
2000, UK (see Case Study 1).





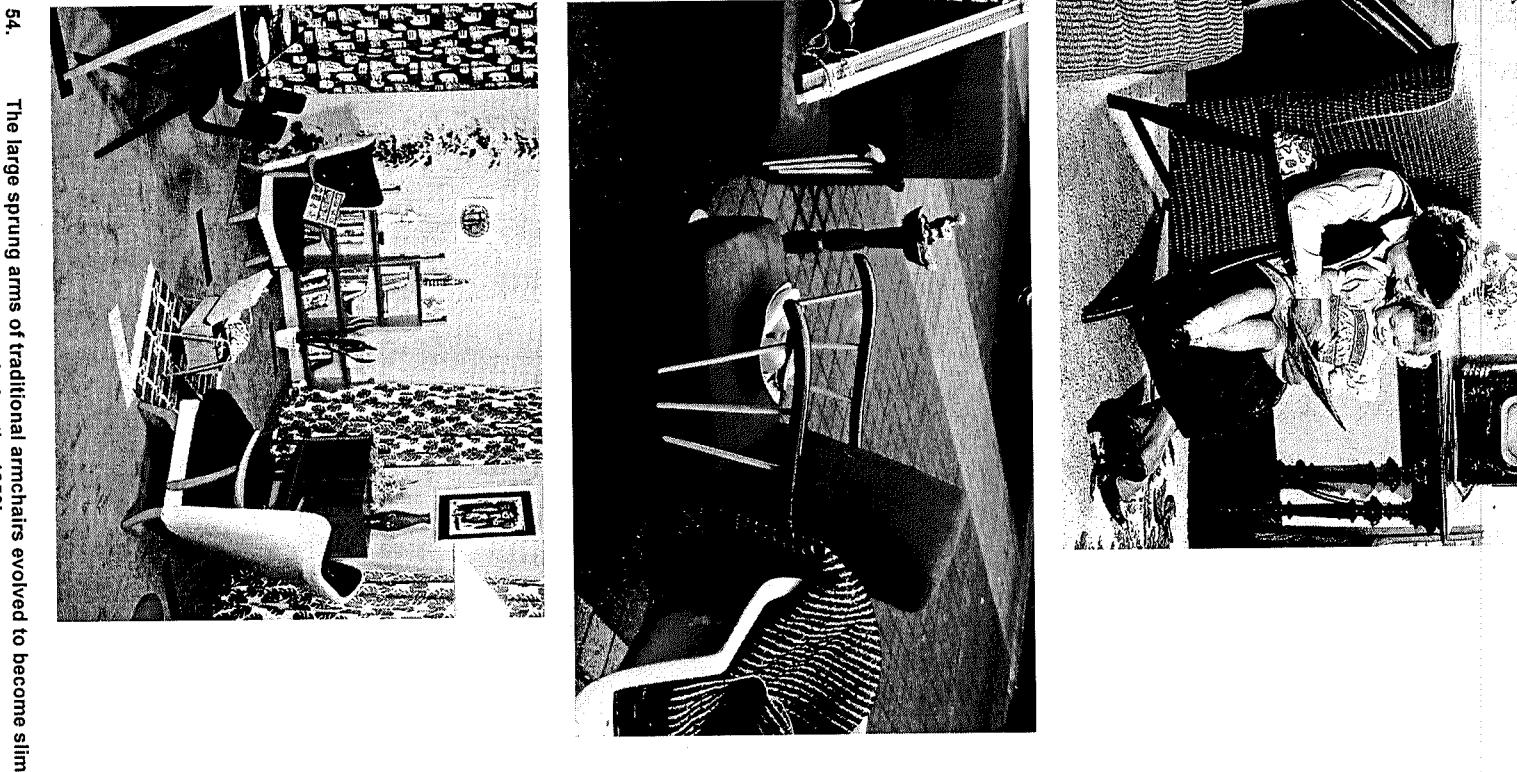
52. Bambino Chair, by Howard B. Keith for HK Furniture, 1950's. The armless version of this chair was observed being used by a breastfeeding woman in 2000.

SHADOW TISSUE
for LOOSE COVERS

1,100 Yards of Heavy Quality Shadow Tissue. A thoroughly hard-wearing cloth, that makes up beautifully into Loose Covers or Curtains. A very popular material for modern furnishing schemes. A wide choice of modernist designs to choose from—carried out in a number of fine colour effects, which though subdued give an air of distinction and charm in almost any setting. The material washes splendidly.
Considering the close weave and beautiful finish the cloth is a most amazing bargain at the SALE PRICE of

3/-
Per Yard

53. Pre-war traditional armchairs are not easy to breastfeed in.



54.
The large sprung arms of traditional armchairs evolved to become slim
timber or steel elbow rests during the 1950's.

all of these chairs is what makes them interesting, particularly those designed by Howard B Keith. Another of his chairs, again typically low in seat height and with an upright backrest is also illustrated. Although passive seating has previously been of a lower seat height than active seating, such as dining chairs for example, prior to the war passive or relaxation seating usually took the form of a traditional arm chair (Fig 53). The kind of post-war chairs illustrated have mostly lost their armrests, or large sprung armrests have evolved to become slim timber or steel arms (Fig 54). The concept of chairs being designed for women to work in (knitting or sewing) possibly was responsible for the removal of armrests as similarly, during primary research, armrests on the test-rig obstructed the activity of breastfeeding (4.5.1).

It is tacitly admitted that no woman can just sit down. She will certainly be either sewing or knitting at the same time. So these chairs are either armless or have arms which fold down to allow elbow room for work.⁴⁵

The chairs illustrated in Fig 55 were all produced at about the same time. With the exception of the Ernest Race chair designed in 1951, Howard Keith designed all the others. Ernest Race is a British furniture designer most well known for the Antelope range of furniture designed for *The Festival of Britain* in 1951. It is clear that quite a subtle variation emerges with the Ernest Race armchairs: the shapes of the backrests are more curvaceous due to the introduction of tubular steel as a material suitable for an upholstery frame (Fig 56). There is a subtle difference in the forms achievable by using tubular steel and steel rod rather than timber to create curves. Both strong and easy to manipulate the welded steel frames of Race, covered in rubberised hair as stuffing, created a soft aesthetic coming naturally from the materials themselves and the way in which they were worked. Bringing metal in to the home was still quite radical in 1951, yet the transition for many people was fairly rapid due to the lower cost, particularly of kitchen chairs with rod or fine tubular steel legs which rapidly caught on, perhaps because:

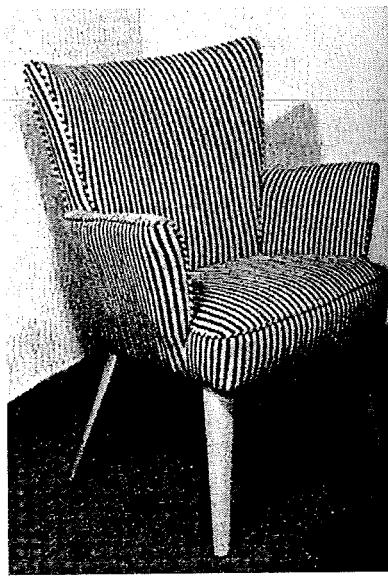
By virtue of the fact that the strength of thin metal rod or tubing is equal to two or three times its thickness in wood, a new elegance is achieved which would otherwise be impossible.⁴⁶

And, it was cheap.

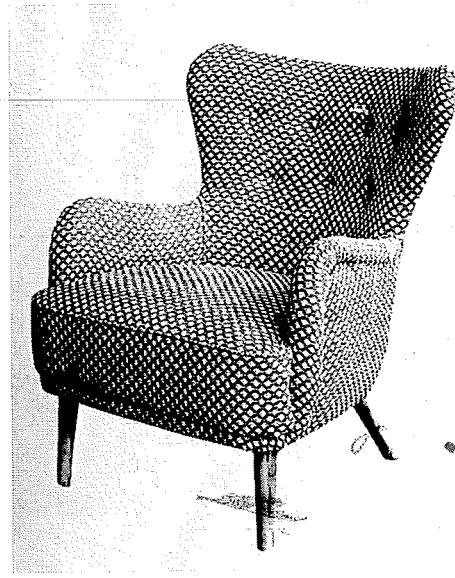
Another chair difficult to date but clearly used during the latter part of the Twentieth Century is

⁴⁵ Ibid, p.70

⁴⁶ Black, B, *The Accent is on Metal*, The Daily Mail Ideal Home Book, (1956), p.75, from the MODA archives, Middlesex University, (2002)



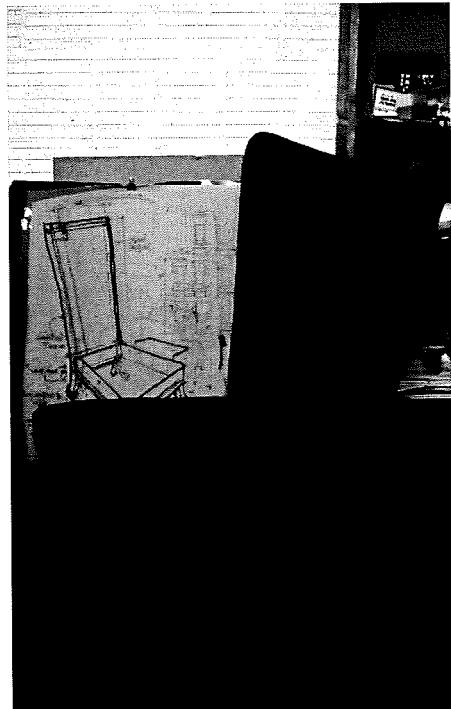
55. Howard B. Keith, 1950's



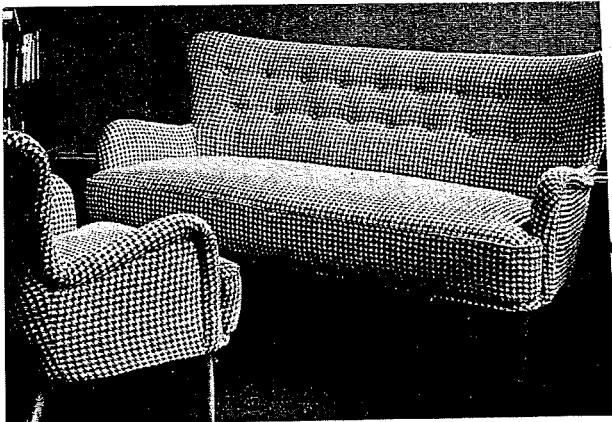
Ernest Race, 1951



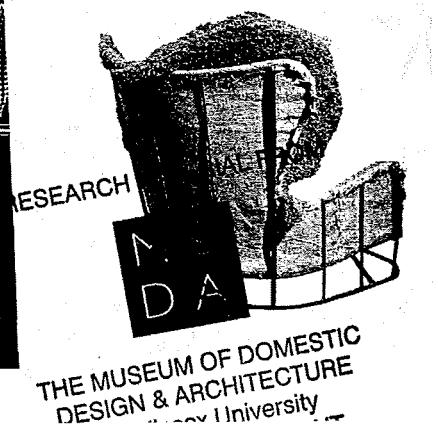
Howard B. Keith, 1950's



Howard B. Keith, 1950's . Armless version of *Bambino* (Fig.52) observed being used by a breastfeeding woman in 2000.

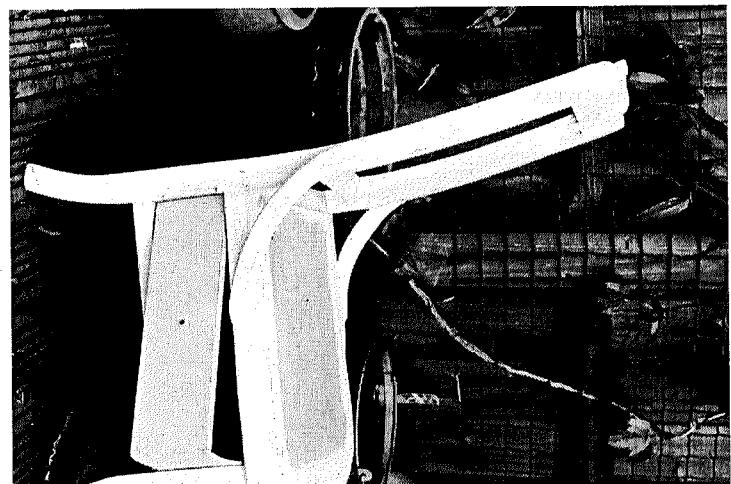
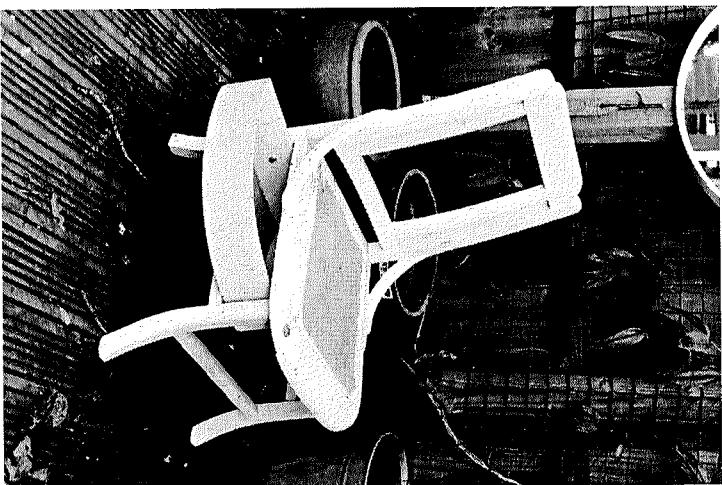


stuffing, a technique to give slim curves with strength.



56. The welded steel upholstery frames of Ernest Race created a softer aesthetic than those made of timber.

57. Chair used by breastfeeding women, Buckinghamshire, 2000.



illustrated in Fig 57. This is a chair with a similar concept to that earlier in Fig 39. It was designed and made by a Buckinghamshire father for his breastfeeding wife (it was given to me by a local man during primary research in 2001). What is most interesting about this chair is that its dimensions accurately reflect those determined later in this study (4.3) as the most ergonomically correct for breastfeeding, although the rake of the back appears too steep and would require a small cushion behind the user's back in order to help the breast to fall forwards. It also has a tray which swings out from underneath the seat for the storage of accessories such as muslin squares and cotton wool pads (4.3.3). The way in which the chair has been painted suggests a personalisation of it of the kind seen later (see Case Studies, 3.2).

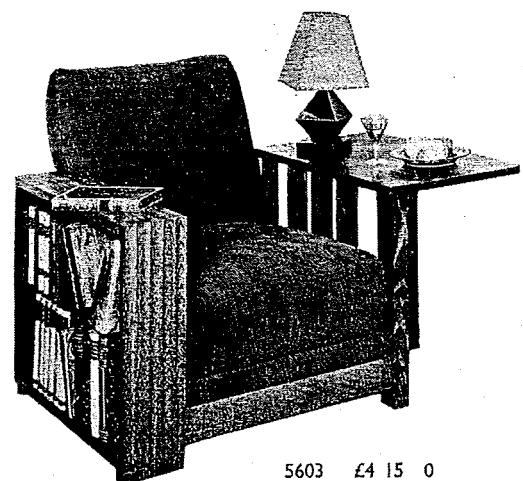
By the grouping of miscellaneous accessoried chairs identified from a similar era, I was able to find several features that were useful to the design of the breastfeeding chair and that were ergonomically appropriate for a mother breastfeeding. Of the chairs illustrated in Fig 58, those incorporating side tables, magazine racks and storage were of the most interest, since primary research indicated a need for a place to put accessories such as a glass of water, muslin square, book or telephone:

Many small tables are planned to fit round the sides of armchairs, where they look just like shy tots cleaving to a well-upholstered mum.⁴⁷

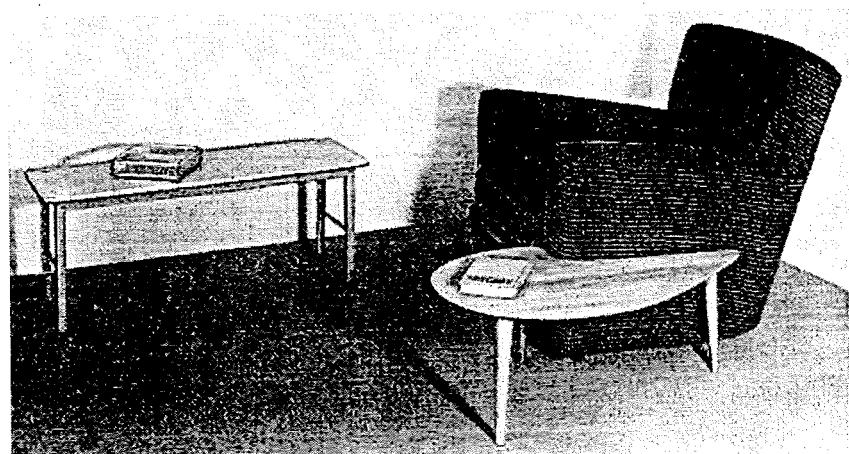
The gender specific nature of these chairs is of further interest. Those aimed at women generally were for sewing or knitting; those aimed at men were for reading the newspaper or pipe smoking. If breastfeeding had been more popular during the 1950's and 60's accounts such as the one below might have sounded quite different and we may have been reflecting on an alternative chair story - a story about chairs designed for breastfeeding:

Never since Victorian days has it been remembered that women need chairs specially built to suit their anatomy. A woman cannot be comfortable in those great tombs of chairs so long in the seat that she cannot respectfully reach the back unless her legs stick out in front like a child's. Now several designers have made charming little upholstered chairs specially made to fit the feminine shape. It is tacitly admitted that no woman can just sit down. She will certainly be either sewing or knitting at the same time. So these chairs are either armless or have arms which fold down to allow elbowroom for work. One firm designed a fireside chair especially for father. In sharp contrast, this was fitted with every

⁴⁷ Reeder, H, *Progress In Modern Furniture*, The Daily Mail Ideal Home Book, (1951-52), p.74, from the MODA archives, Middlesex University



5603 £4 15 0



58. Chairs for tasks such as reading or sewing often had side tables attached or integral to them. These have inspired the side storage table for the breastfeeding chair.

kind of aid to leisure, a place for a tumbler, for a newspaper, even a neat little table which popped out at a touch of father's finger.⁴⁸

The woman writer of this article (1951) makes no bones about the fact that women's chairs are for 'work' - knitting or sewing, and men's are for 'leisure' - drinking and reading. In fact the whole tone of the article is very much demonstrative of the social attitudes of the time and what is most interesting is how these attitudes had a direct effect on the design of furniture. The same author, talking about 'modern furniture' in the same magazine is here justifying the typically tapering legs of the time in similarly gender specific terms:

The chairs and tables all stand on outspread tapered legs like a ballet dancer on her points....The idea is to give a feeling of wider floor space in small rooms – floating, the designers call it. The housewife welcomes this trend because it makes cleaning easier. Indeed the housewife, alternately cajoled and bludgeoned by people in authority, can make a pretty curtsey to the furniture men. They have thought of her when their new designs were at the sketching stage.⁴⁹

This today sounds patronising: accepting of her role, the writer's prose is very much typical of the era. Did everybody then, like the writer above, really miss the point? It is hard to believe that breastfeeding wasn't an issue to be discussed relative to seating. It is also a shame and a missed opportunity because it was never recognised that the upholstered chairs of the 1950's were so close to being practical for breastfeeding women. Making slight amendments to the angle of the backrests in most cases is all that would have been necessary. Alas, few of these companies now exist. The designers, if still alive, are, with the exception of Robin Day, no longer designing and the aesthetic of upholstered chair manufacture today, certainly for the domestic market, is more akin to the large heavy chair styles of the 1920's and '30's than those of the '50's and '60's.

In 2002 little has changed: no chair for breastfeeding exists. Although we no longer see accounts like those above in our design press and although more women do now breastfeed than did in the 1950's and 60's, it remains a taboo subject and ironically **chairs to do it in are frequently modified versions of chairs from a bygone era adapted to make them comfortable to breastfeed in.**

The chairs illustrated earlier in Fig 33 are particularly interesting. They too were discovered during primary research for this study. They were designed by Day in the 1960's but not in the form we

⁴⁸ Ibid, p.70

⁴⁹ Ibid, p.70

are seeing here. Originally produced in moulded fibreglass, staff at *Gloucestershire Royal Hospital* decided to adapt them in the 1970's to more ergonomically suit breastfeeding. They had the tubular steel legs cut down to create a lower seat height and upholstered the whole of the form of the shell seat in a thin layer of foam covered in blue vinyl. There are fifteen still being used today in the waiting area of the special care baby unit, the arms being needed in this scenario due to the small size of the babies being fed, enabling the mother to support her elbows. By all accounts these chairs are treasured by the current staff and despite the need to add a pillow to the lumbar to bring the back into a more upright position, the staff believe them to be 'hard to beat' (see 3.4.5).

3.5.3 Issues of Comfort: Questions of Upholstery

According to Dr. Catriona Clear:

For breastfeeding to succeed the woman needs to be able to sit down with the baby several times a day, sometimes every hour and sometimes for an hour.⁵⁰

Needing to sit down so much demands comfort. Perceptions of comfort vary and we often hear people make conflicting judgements about their own comfort. A chair that is described as feeling comfortable one day is declared uncomfortable the next. Galen Crantz in her work on the culture of chairs reinforces this, blaming the designers and manufacturers of chairs for perpetuating the cultural myth of the comfortable chair. She argues that the relationship between comfort and productivity is elusive, and that managers who claim that their workers will be more productive the more comfortable they are, are selling this myth on suspect grounds. Productivity may well go up if workers believe that their managers care about their comfort and support their needs, physically and psychologically, therefore it becomes difficult in research terms to measure performance against comfort.

Ergonomists argue about padding or no padding, thin padding or thick padding, yet none of them suggest exactly what thickness in inches or millimetres they would recommend or at what density, what weight and for what functional application a foam, for example, should be specified.

Ideas about what is comfortable vary from one historical era to another. Has comfort become so detached from human experience that it has become a category of fashion?

⁵⁰ Clear, C, *Women of the House*, Ireland, (2001), p.135

Penny Sparke in her acclaimed text about the sexual politics of taste, *As Long As It's Pink* similarly discusses the relevance of upholstery during the Victorian era and onwards. She suggests that it is not only an issue of comfort but also of the differences in decorative attitude between men and women, and, that our perceptions of comfort are informed by many other, often conflicting issues.

Easy chairs and settees seen in mid Victorian interiors especially after the invention of the coiled spring during the 1820's evoke an immediate sense of physical comfort with deep buttoning emphasising that effect. The Chesterfield sofa is a good example of this: the visual effect of comfort over and above actual comfort. The widespread use of draped fabrics like velvet, damask and lace, draped at windows and across furniture enhanced this and the use of heavier fabrics also muffled sound, softened light and added to a feeling of quiet.

Sparke argues that many eminent and celebrated creative men of the Victorian era, probably feeling threatened by all this 'frippery', attacked it as a style, on the grounds of feminine consumption rather than the masculine sphere of manufacture that they wanted to enforce. Critic Charles Eastlake was no exception:

How often do we see in fashionable drawing rooms a type of couch which seems to be composed of nothing but cushions! It really is supported by a framework of wood or iron, but this internal structure is carefully concealed by the stuffing and material with which the whole is covered. I do not wish to be ungallant in my remarks, but I fear there is a class of young ladies who look upon this sort of furniture as elegant.⁵¹

In trying to enhance a sense of comfort women were criticised for disguising one material with another, therefore acting dishonestly. Arguing for ornament to always be derived from construction, protagonists like Pugin and Eastlake argued that applied ornamentation and decoration of any kind was a false virtue and that as far as women were concerned:

Her intellect is not for invention or creation, but for sweet ordering and arrangement.⁵²

Attitudes to decoration are always changing. Psychologically we may feel a chair is comfortable even if it is harming us physiologically. The same can be said of breastfeeding: we may feel like we are 'doing it right' whilst physiologically we may be inappropriately positioned. The low seat height of nursing chairs, the erect angle of the back and firm under knee support are not

⁵¹ Eastlake, C, *Hints on Household Taste in Furniture, Upholstery and Other Details*, (1872), p.16; from Sparke, P, *As Long As Its Pink*, Harper Collins, (1995), p.121

⁵² Ruskin, J,(1850), from Sparke, P, *As Long as It's Pink*, Harper Collins, (1995), p.63

conducive to lounging. A breastfeeding chair may even challenge our notion of what it is to be comfortable, for lounging is not conducive to comfortable breastfeeding. *How to Breastfeed* (1964), makes a rare and welcome reference to the comfort of 'the nursing chair' at a time when breastfeeding had almost died out in Ireland and England:

Both mother and baby should be comfortable. The nursing chair should be a low one for greater comfort; it is often an old chair with its legs sawn off to make them shorter. But a footstool used with an ordinary chair is just as good. You will of course arrange to be in a room by yourselves if possible so that there will be no distracting noise or interruptions.⁵³

Upholstery has offered many solutions to problems of comfort, although it is important to remember that the addition of upholstery does not by any means suggest that a chair will consequently be comfortable. Crantz argues against heavy upholstery in her book by suggesting:

...feeling the sit bones and the transfer of weight down to them is desirable. This indicates that the seat should be planar, but also that it should be only lightly padded. Although a quarter to half an inch of extremely firm foam is adequate, it eventually 'bottoms out' so wool felt (or any other renewable source) is both anatomically and ecologically preferable.⁵⁴

Several aesthetically uncomfortable looking chairs made of hard materials are surprisingly comfortable, Gerrit Rietveld's *Red/ Blue Chair* being a good example. Designed in 1918 it was made from solid boards of sheet plywood of 18mm thickness, and solid square sectioned hardwood. Firstly, the relationship of the angles of the seat and back rest do not allow any feeling of the body slipping forwards, despite the painted surfaces (Fig 59). Everything feels supported. The position of the sitter's pelvis and the height of the armrests seems to aid perfectly the action of lifting yourself out of the chair. Many critics argue strongly in favour of postural, structural comfort over and above 'softness'.

Like the Eames *L.C.W.* chair, described earlier, (Fig 60) *The Red/Blue Chair* does not appear to be comfortable yet it is. With the *L.C.W.* the comfort strived for by the Eameses over a fifteen-year period with the appropriation of timber laminated compound curves and no upholstery

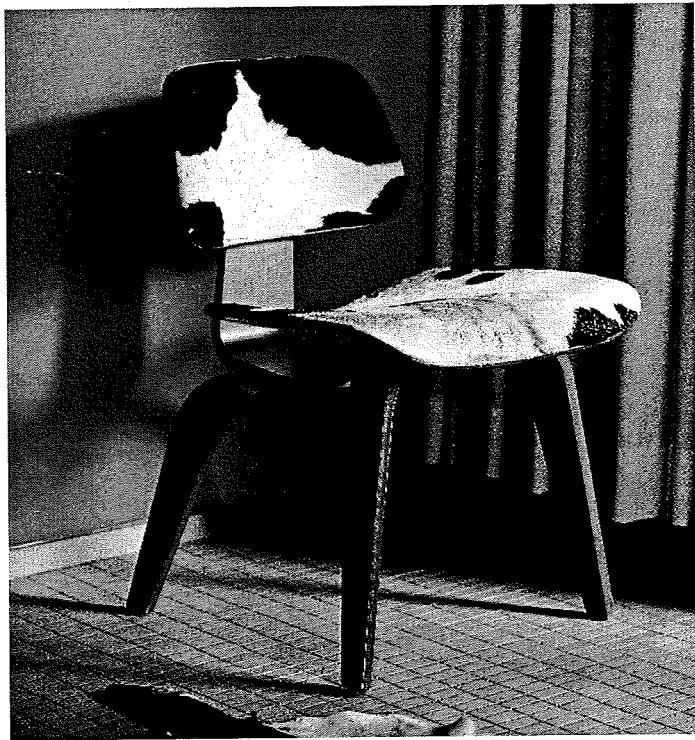
⁵³ Ibid., p. 68

⁵⁴ Crantz, G, *The Chair*, (2000) London/USA, Norton, p.134



Rot-Maer Stuhl 1923, Holz, CMU

59. The Red/Blue chair by Gerrit Rietveld, 1918.



60. L.C.W. by Charles and Ray Eames, laminated with pony skin, 1946.

certainly paid off. Few would dispute the comfort of this highly acclaimed non-upholstered chair. Ironically in this image of it, pony skin has been laminated onto the seat and back, which raises the question - was this to add tactile softness or aesthetic interest, or both?

A compromise between no upholstery and heavy foam upholstery might be *Memory Foam*. *Memory Foam* is a relatively recent invention which is now being piloted by many manufacturers of office seating. It is a foam which shapes itself to the sitter, avoiding pressure on specific parts of the body as body weight is spread evenly across the whole surface area of the foam. It feels structurally much firmer to the touch than other foams of similar density and has similar tactile qualities to human flesh (Fig 61). Such a material offers great potential for a breastfeeding chair. For instance it is clear to see from the illustrations of Case Study 4, earlier that Christine admits that her 'soft squishy sofa' is causing her much frustration (Fig 62). The cushions are deformed to such an extent that they cease to support her in any structural sense, other than to hold her body up off the floor at an unhelpful height of 400mm.

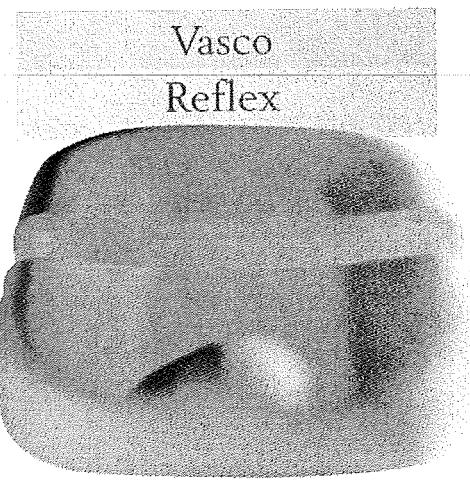
Foams became lighter and slimmer in section during the 1950's. At the time of *The Festival of Britain* in 1951, design proliferated with decorative elements. Scientific imagery was used in celebratory ways: most memorably the molecular structures seen through the microscope were adapted as decorative elements on furniture and textiles (see Fig 63). Upholstered armchairs and sofas during the fifties, particularly in Britain saw a dramatic change predominantly influenced by the invention and development of latex foams, webbings and tension springs:

In upholstery, the bulky over stuffed three-piece suite is rapidly giving place to slimmer, more graceful individual chairs. This tendency has been accelerated by the limited living space available to the average family in Britain and to the employment by the manufacturers of newer constructional methods using latex foam, rubber webbing and cloth covered tension springs in place of the customary spiral springs.⁵⁵

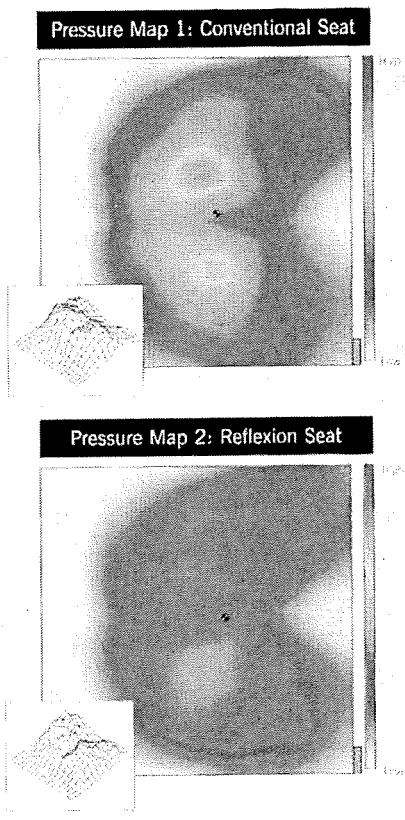
Dunlopillo loose cushions resting on top of cloth covered tension springs combined with upholstered sprung backs became the norm in many households. Upholstery frames started to look and feel lighter (see earlier, and Fig 54).

By 1956 polyvinyl chloride had well and truly arrived. Many brands of plastic coated cloth rapidly became available, being most commonly advertised in the trade press at the time. *Furnishings*

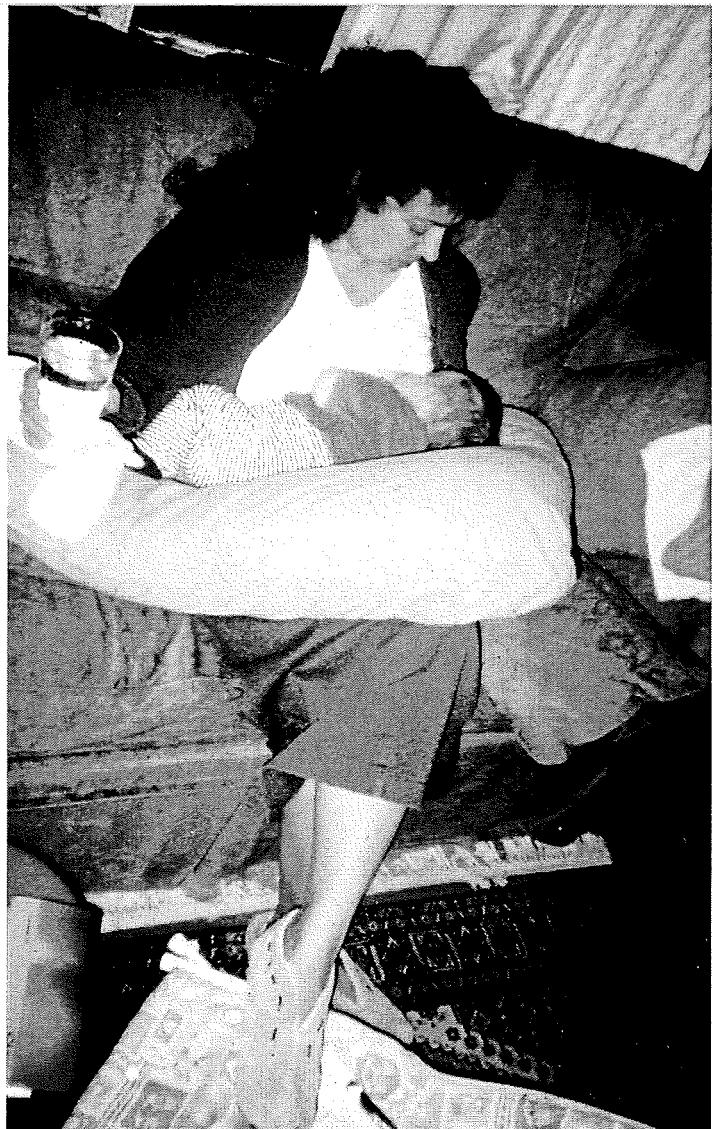
⁵⁵ *Furnishings From Britain*, (1956), p.32; MODA Archives, Middlesex University, (2002)



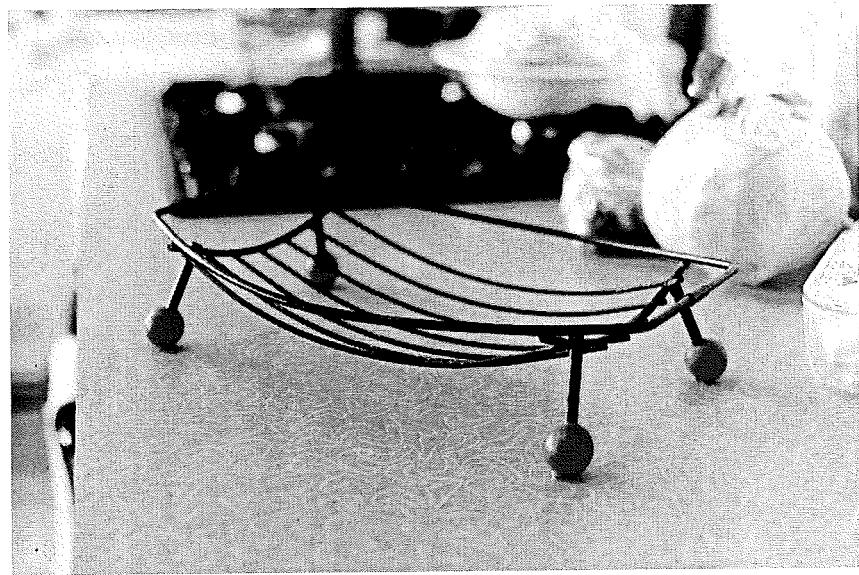
61. Cross section of a typical *Memory Foam* seat cushion.



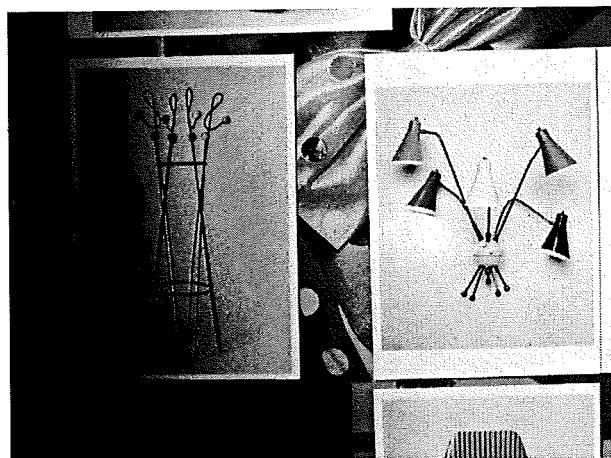
Memory Foam feels firmer and more supportive than most conventional upholstery foams.



62. **Case Study 5:** The cushions on this sofa are deformed to such an extent that they cease to support this mother's body in any structural sense.



63. Molecular structures seen through the microscope were adopted as decorative elements on furniture and textiles in the 1950's as with the fruit bowl (above).



Similarly this coat rack and lamps.

from Britain was the newest magazine to be launched that year, and was designed as an 'export magazine' aimed to advertise British furnishing textiles to the rest of the world.⁵⁶

Steady progress continues to be made in the quality and design of plastics-coated cloths for furniture upholstery. Originally introduced as a less expensive substitute for upholstery leather, a big step forward was made with the commercial introduction of poly-vinyl chloride, or to give the material its abbreviated name, PVC, and since then numerous brands of plastics coated cloth have been introduced. The best of them possess great durability, are difficult to scratch or crack, are stain resistant and very readily washable. They are made in an extensive range of fast colours.⁵⁷

Patterns designed by Ray Eames and Lucienne Day are now more than ever sought after by Fifties collectors. However, the evolution that soon followed in the world of vinyl, saw colours dimming and vinyls thickening, to cater for impermeability and the more conservative tastes of hospitals and nursing homes. Unlike the early vinyls celebrated by the Eameses later variants became the stereotypical image of the furniture commonly seen throughout the 60's and 70's. Today it is vinyl of this form that is the most commonly found upholstery material in *NHS* hospitals. Of the three key hospitals and three key *NHS* clinics investigated for this study, all, apart from the foyer of the *JR Hospital* entrance foyer to *The Women's Centre*, house chairs upholstered in a variety of colours and specifications of vinyl. But its wide spread use in the *NHS* is based on a number of misconceptions concerning the material, first and foremost the perception of vinyl as a hygienic material. Architect Richard Mazuch explains why he believes vinyl to be *unhygienic*:

As vinyl is a sealed plastic coated material with an inherent unpleasant texture, it fails to breathe with the patient. Therefore patients will stick to the material and sweat resulting in perspiration and bacteria lying on the surface, increasing the risk of the spread of infection.⁵⁸

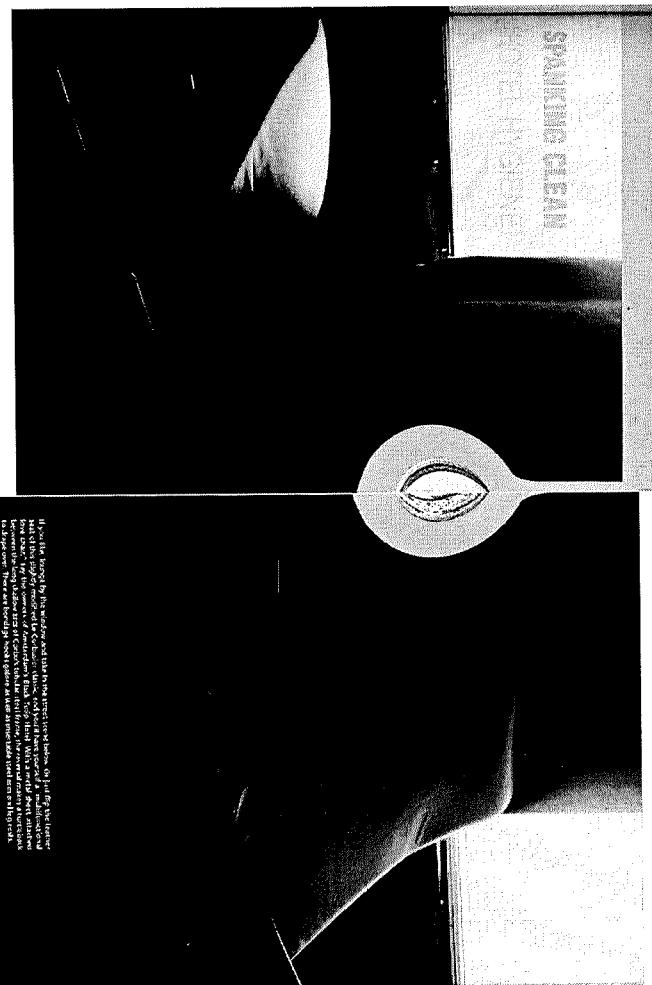
The cleaning problems facing a hospital or clinic could usefully be compared to those of a hotel. At Amsterdam's contemporary *Black Tulip Hotel* cleaning is a major concern (see Fig 64). Advertised as a 'speciality' hotel, its proprietors Frank and Eelco, being interviewed by Dan Savage for *Nest Magazine*, discuss the misconception that a 'gay leather hotel has to be dirty':

⁵⁶ *Furnishings From Britain*, The National Trade Press Ltd, (March 1956), No. 1, p.36

⁵⁷ Ibid, p.37

⁵⁸ Mazuch, R, architect for RTKL UK Ltd, London. Interviewed by Smallwoods, N. for her Technical Report, MA Furniture Design & Technology, (21/02/01)

64. *The Black Tulip Hotel, Amsterdam, 2001. The problems of cleaning are paramount in this hotel.*



They think it can't be a nice clean place but why shouldn't it be? Even people into S&M want to sleep in a nice clean bed and have a clean bathroom.⁵⁹

Clearly hygiene is a challenge with problem substances including faeces and semen: 'Getting come stains and popper stains out of the carpet left huge orange and white splotches' Frank explains. Apart from carpets, which are no longer down, everything else can be cleaned and sterilised. The only forbidden substance due to its greasiness is Crisco, lubricant grease too difficult to clean out of sheets and towels.

It can be concluded then that most textiles are cleanable. Indeed since the turn of the century the upholstery on bus and train seats is most often velour or a similar pile fabric and rarely these days is it vinyl (Fig 65). Taking such thinking into account a more lateral and sensitive design approach needed to be taken in searching for materials empathetic to the user of furniture for breastfeeding. It should be remembered that the spread of infection is not a primary concern for many areas of health care. In waiting areas in cancer clinics, counselling rooms, and breastfeeding rooms staff are clearly more concerned with the psychological welfare of their visitors.

The use of vinyl also has negative environmental implications. Fig 51 earlier illustrated one of two chairs designed during the 1950's being used by Carly, one of the case studies for this research (3.2.1). The vinyl cover is identifiable from the *Florestin* range of PVC - coated upholstery cloths produced by Armoride in London featured in *Furnishings From Britain* in 1956.⁶⁰ Some forty years later and the fabric appears to have not discoloured, torn, worn or cracked, suggesting the claims made in the journal originally are credible. However, as ecologist Victor Papanek warns in his acclaimed environmental study aimed at designers, *The Green Imperative*, the material has stood the test of time perhaps too well and plastics like PVC will continue to pollute the planet for hundreds of years:

One of the main difficulties lies with the fact that plastics just won't go away. It has been estimated that a discarded plastic bottle will be around for between two to four hundred years.⁶¹

We can no longer afford to be irresponsible when specifying plastics; vinyl, *Formica* or any of the

⁵⁹ Savage, D, *Spanking Clean – Hotel Hygiene*, *Nest Magazine*, (Spring 2002), p.53

⁶⁰ *Furnishings From Britain* (national trade press publication from the MODA archives, Middlesex University) (1956), No.1, p.36

⁶¹ Papanek, V, *The Green Imperative*, Thames & Hudson, (1995), p.39



65. Renovated in 2000, the seats in this 1940's train carriage have been re-upholstered in velour fabric.



The seats in this commuter ferry (2002, Italian Lakes) survive daily abuse, and are upholstered in velour fabric. According to Mazuch, bacteria will lie on the surface of vinyl, making it less hygienic than other surfaces.

many other plastics regularly specified by furniture, interior and architectural designers. The long term ecological consequences of this kind of lack of awareness are harmful and irreversible. This is undoubtedly the most important reason for the decommissioning of plastics in the furniture industry.

More recently the trend for minimalist interiors and neutral colours has become fashionable once again:

A variety of textures in white look stunning together. You can mix white with creams, greys or browns, too. Thanks to washable covers you can also mix it with babies.⁶²

The colour and texture of materials used for upholstery is inevitably influenced by manufacturing processes, certainly for mass-produced furniture; fabrics fade and will have varying degrees of colour or light fastness. This was an issue that again the Eameses considered seriously throughout the design development period of their chairs during the 1950' and 60's which was not widely recognised. However, in the biography *An Eames Primer*, Eames Demetrios clearly wants this sensitivity to be celebrated. In an interview with Irv Greene of *Zenith Plastics* he states:

They knew exactly what they wanted. They knew the colours exactly to the T. They wanted to select colours that would minimise the effect of discolouration due to the process itself. They also wanted the colours that would be neutral, that would work in different situations in interior decorating: the parchment, the greige and the elephant hide grey, which was really kind of a light black,a, you know, warm light black...And hour after hour...just making samples-colour samples of chairs to develop the colours. It was a tedious process but it was important to them that the colour be right.⁶³

That these considerations remain vital for the design of the breastfeeding chair was confirmed by Anne Greer, a designer working at *The Gloucestershire Royal Hospital* (2001) who specifies light, neutral colours for upholstery fabrics due to their higher resistance to fading by daylight. She spends much of her time making sure that features such as curtains, chairs and carpets being specified by others in the hospital, make functional, practical sense in terms of colour⁶⁴ (see 3.3.5 and 3.4.5).

⁶² IKEA catalogue (2001), p.126

⁶³ Demetrios, E, *An Eames Primer*, Thames & Hudson, (2001), p.118

⁶⁴ Greer, A, interview with author, Gloucester, (16/9/00)

Achieving a comfortable domestic aesthetic using technology originally borne for the contract market is relatively rare. The amount of investment in upholstery technology in the contract office furniture market has been far greater than that for the domestic market over the last thirty years. If some of this technology could be applied to the breastfeeding chair- empathetic to both the home and hospital environment we might find that the two markets are more compatible than has been previously believed (see 4.8).

Today, many women during primary research cited sheepskin as their favoured 'comfort' material (see 1.2.2). Its properties are well known: it holds heat, is warm to the touch, and comforting to feel on the skin. Some self-help mother and baby books specifically suggest that laying your baby on a sheepskin mat will help it to sleep and provide warmth. Yet, as a fabric that can only be dry-cleaned, it causes a problem for the nursing mother. Synthetic washable substitutes can be found, but are often plastic in their feel, and generally do not offer the same properties as a natural fleece. Fabrics developed for the fashion industry seem to come the closest to achieving the cosiness and warmth required by mothers (Fig 66).

The technical advances in the manufacture of fleece fabrics for clothing provide potential for the upholstery industry. *Dawson's Fabrics* in Huddersfield produce *sliver-knit* fabrics for the fashion industry. They maintain that their softest fleece fabric could be developed relatively easily to fulfil current *FIRA (Furniture Industry Research Association)* testing requirements for upholstery fabrics to fulfil the requirements of the design brief for a breastfeeding chair (see later, 4.4).

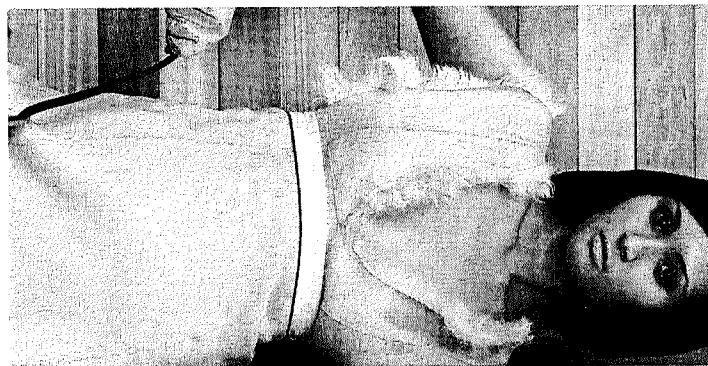
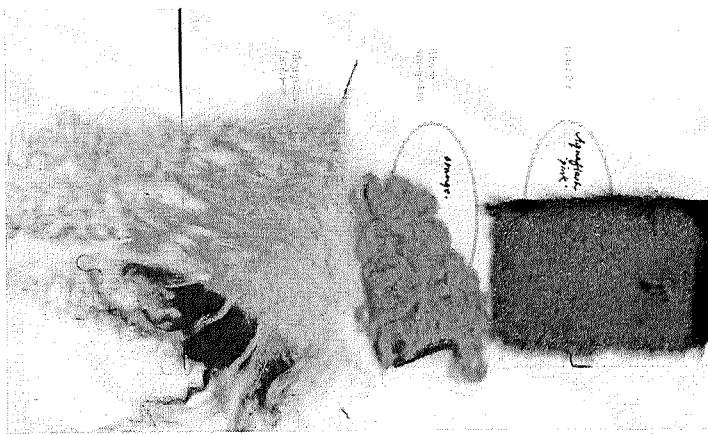
Acrylic fleece is a knitted fabric, much more environmentally friendly than PVC. It uses less energy at the manufacturing stage, is made of thread and is therefore more energy efficient to de-construct. Moreover, fleece clothing can see many life cycles, either being passed on to siblings or sold second hand.

It is porous in nature and more able to breathe with the person sitting on it thus preventing the build up of perspiration and bacteria. The warmer, cosier temperature of fleece materials, caused by its deep pile and long nap also give it high insulative qualities.

The temperature of materials is an extremely important area, especially for people with illnesses who have extreme body temperatures and will as a result have extra sensitive nerve endings and extreme reactions to the temperature of materials used in their surrounding environment⁶⁵

⁶⁵ Mazuch, R, architect for *RTKL UK Ltd*, Interviewed by Smallwoods, N, for her Technical Report, MA Furniture Design & Technology, (21/02/01)

66. Fabrics developed for the fashion industry come the closest to achieving the tactile qualities specified by breastfeeding mothers.



The subtle therapeutic properties of the material were the most evident in discussions with breastfeeding mothers. Their comments therefore inspired collaborative research with *Dawson's Fabrics* in Huddersfield to develop a suitable fabric for upholstering this project's breastfeeding chair. This research is defined in Chapter 4. (see later, 4.4).

3.6 Conclusion: Chapter 3

There are many ways in which evidence could have been collected for this study. In furniture terms, a comprehensive history of nursing chairs has not been presented as it was deemed more useful to select chairs representing a design approach relevant to the study. Having suggested in the introduction to this chapter that *nursing chairs*, so named during the Victorian era were not designed for breastfeeding, few examples of these are illustrated and discussed. Much more importantly, chairs are discussed which represent an approach to designing breastfeeding chairs rather than a catalogue of examples relating to the breastfeeding genre. Observations of furniture used by breastfeeding women are used very carefully to trigger observations of other pieces of furniture in particular that from the 1950's in Britain. In summary, the evidence investigated therefore has been collected from:

- Six case studies – two from the north of England, four from the south
- Interviews with experts in the fields of breastfeeding and of design
- Interviews with experts identified as having researched similar issues, for example, Sheila Kitzinger and Germaine Greer
- Observing the arrangements of furniture in the homes of breastfeeding women
- Observing the arrangements of furniture in clinics and hospitals
- Conversations with women in clinics and hospitals
- Historical chairs, selected for individual relevance
- Chairs currently being used for breastfeeding
- Archives which include chairs
- Archives of journals
- Observations of breastfeeding in public
- Secondary sources

On reflection it is the uniqueness of much of the primary observational material that is of most interest and use to the project. Activities in the private homes of women which involved measuring, drawing and photographing them whilst breastfeeding quite naturally as part of their daily routines shed much new light on the problems encountered by them. Without exception, these meetings provided critically useful information.

Whether interviewing a mother in her home, a specialist in her clinic, or celebrities such as Sheila Kitzinger or Germaine Greer I found them to be overwhelmingly interested and sympathetic to the issue. There was not one incidence of an interview being refused, with many overrunning their time allocation sometimes by hours.

Site visits were useful for informing particularly about the furniture in its context. People were extraordinarily helpful, often sending information months after a visit. The distinct lack of any findings of furniture designed for breastfeeding during these visits inspired the historical search for evidence of such chairs and it was in the homes of breastfeeding women that I was to find the most evidence. It was here that I first realised the importance of 1950's chairs as their presence was seen in more than one home. However, the search for this evidence seemed almost futile, with very few chairs being discovered. More often than not women struggled to breastfeed on structurally unsupportive sofas with mountains of cushions. Unproductive searches at the V&A in London and from the *Wellcome Trust* also inspired me to search for more chairs in more homes.

Chairs that had been adapted for use as breastfeeding chairs further confirmed the need to design them. In particular, the Robin Day chairs at *The Gloucestershire Royal Hospital* proved again the need for such chairs. Chloe Fisher, breastfeeding consultant at *The Infant Feeding Centre at The John Radcliffe Hospital* even proudly showed me the old saw she had used to chop the legs of her chairs down to provide the right seat height. Luckily, the legs of the chairs were made of timber.

How often do we unexpectedly see women breastfeeding in public in the UK? Since the research for this project began in 1998, I personally saw three in total: one feeding in a car, one in a café, and one at an Arts & Health conference. Three observations in four years, yet friends on holiday both in Africa and in Scandinavia eagerly sent me images of breastfeeding women, commonplace in those regions. (Chapter 1 highlighted this geographical and cultural lack of parity.)

Design evidence then focussed on chairs that women use to breastfeed on, mostly privately and mostly either in the home, at a clinic or in hospital shortly after the birth. From this evidence several facts came to light:

- No woman during the four-year research period was observed breastfeeding on a chair designed for the activity.
- All women observed used chairs that had been adapted either by themselves by adding cushions or other props, or by midwives or health visitors in clinics.

- Where chairs were provided for the initiation of breastfeeding beside hospital beds, they were chairs that had been designed for geriatric use. They were in all cases upholstered in vinyl and in all cases too high to satisfactorily and comfortably breastfeed in.
- Garden chairs and ironing boards for example, carefully juxtaposed, were observed to be used by some women. In what other scenario is this the case? Consequently the investment into office seating had to be questioned.
- The accessories women used needed to be accounted for when designing the chair.
- Many health visitors and midwives though uncertain about the ergonomic requirements of the chairs, did know that the height of the lap ought to be raised, and made efforts to do so by putting piles of books under the feet of women, or by putting cushions behind their backs in order to bring the angle of their backs into a more upright position.
- Women covered their chairs with sheepskin, a towel or a blanket in an effort to soften the tactile quality of the chair (The development of an upholstery quality fleece fabric is included in the study in response to this in Chapter 4).

Chapter 4 aims to work with this evidence and apply the findings of the research to the design of several full size mock-ups in the first instance, before concluding with the design of a production prototype, made in collaboration with a manufacturer of office seating and a manufacturer of fleece fabrics. The ergonomic data presented in Chapter 4 is one of the most useful outcomes to have evolved from this study. It could be taken by any designer and used to design any number of styles of chair: the sizes and angles will be essentially the same whether a traditional or contemporary style is desired.

In the light of the social, historical and contextual findings presented in Section A and the evidence collected and collated in Chapter 3, a design brief will be formulated and a design methodology presented in the following chapter, Chapter 4: Design Development.

4. Design Development

Introduction

This chapter charts the stages of design development from the design brief to the final design proposal. The narrative mode of the chapter is direct and factual and records a structured approach to the practical aspects of designing things, in this case, a breastfeeding chair. Once the brief is established, a design methodology is proposed. Practical methods for defining the new ergonomics of the chair form a pivotal role, and include the design and making of a test rig, the measuring and recording of women whilst breastfeeding and the drawing of relevant dimensions of women and the things they sit on. Much of this work was conducted using data collected during the stages of primary research described in chapter three. A study about the development of a new upholstery fabric, also arising out of primary research described in chapter three, pre-empts the prototyping methods described in the latter part of the chapter. The chapter closes by presenting the first commercially produced chair. The chair illustrated in Fig. 36 was the first to be sold, to The *Bromley-By-Bow Baby Clinic* in London on *International Women's Day* (March 12th) 2003. The illustrations at the end of the chapter were taken on that day.

4.1 The Brief

The design brief is a comprehensive statement of the requirements of a design project. It should give the designer the flexibility to fully explore the most creative design solutions to the opportunity whilst knowing that all the strategic, management and technical issues will be covered.

Following meetings with the *Invest in Breast Together Partnership* (see 3.1.1) the following questions were formulated:

- What is the perceived need among women themselves for a chair to support breastfeeding?
- What is the current availability of such furniture in areas where women might be expected to breastfeed both in public areas and in the home?
- What is the perceived need for such a chair among professionals and other experts in the field?
- What ergonomic data is required for the design of a breastfeeding chair?

In answering the above questions, the overall aim of the research was to design and test the utility of a new chair for breastfeeding women.

In addition to the primary data collection there was also a great deal of secondary research through literature, museums, catalogues and archives which was also undertaken and which is referred to in chapters 1, 2 and 3.

4.1.1 Objectives

The specific objectives of this project may be defined as follows:

- To establish the need for a breastfeeding chair.
- To conduct and complete the research, design and development of a chair, to meet the needs of breastfeeding women.
- To test mock-ups and prototypes with groups of women in terms of aesthetics, comfort, facility to breastfeed, and satisfaction with feeding from the chair.
- To write and present supporting text of an historic, cultural and design nature intended to contextualise the chair.
- To present the research and the chair at the *CPHVA National Annual Conference 2002*.
- To find an interested manufacturer for the chair.

4.1.2 Background

As this project has revealed (Section A) it has long been recognised that breastfeeding rates in the UK are substantially below an optimal level to promote the health of mothers and infants.¹ There are many variables which affect a mother's decision to breastfeed, but a significant factor in the continuation of breastfeeding is infant distress, maternal distress and maternal pain and discomfort caused through poor positioning. Poor positioning can be seen in part to be related to the types of furniture that mothers use to feed from, including that supplied in hospitals, GP waiting areas and clinics, as well as domestic furniture. Frequently mothers can be observed using cushions, stools, piles of books and other often strange and out of context equipment to enable them to reach a comfortable and functional breastfeeding position. Within arms reach

¹ Hamlyn, B, Brooker S, Oleinikova, K, Wands, S, *Infant Feeding Survey 2000*, TSO, (2002)

mothers need a variety of things such as breast pads, a drink of water and on more than one occasion items they described as luxuries, a glass of wine or a bar of chocolate for example (Fig 1).

However, despite this it remains true that to date:

- **There is no known published research which has tested furniture specifically designed for breastfeeding.**
- **There is no furniture currently in production which supports the needs of breastfeeding women.**
- **There is a need to design a new breastfeeding chair.**

4.2 Design Methodology

Methods employed :

- **Primary Research** as described in Chapter 3 (3.1).
- **Secondary Research** as described in Methodology (Overview, p.25)
- **Sketch Development:** This was an ongoing activity and culminated in sketches of final prototypes. The earlier sketches were done during meetings with breastfeeding women and with breastfeeding professionals. The later sketches were used to inform the technical decisions made in conjunction with a manufacturer, together with more detailed technical drawings (Chapter 4).
- **Test-Rig:** A test-rig was built and used in two identified clinic sites (3.4.1 and 3.4.2). Data collected from this was applied to four early mock-ups (see 4.6).
- **CAD Development Drawings:** These were drawn in order to visualise the ergonomic data collected from the research done using the test-rig
- **Mock-Ups:** These were full size, and made from timber, cardboard and *Styrofoam* (see 4.6).
- **Technical Drawings:** These were drawn in preparation for making a test-rig, and in response to mock-ups. They were designed to be used to communicate with prototyping teams both at *Tract* and at *BCUC*, so that a final prototype could be manufactured. They were drawn either 1:5 scale or full size.
- **Production Mock-Ups:** These were made in collaboration with *Tract* in Thame (4.6 and 4.7).
- **Final Prototype:** This was made and upholstered at *Tract* in Thame, Haddenham and High Wycombe, where the different teams at the three sites were engaged in the prototyping process: upholstery (High Wycombe); metal fabrication (Haddenham); marketing and sales (Thame) (4.7).



1. Breastfeeding women like to have chocolate and occasionally wine for example, close at hand.



Frequently mothers can be observed using out of context objects as props, to enable them to reach a comfortable and functional breastfeeding position.

- **Amendments to Final Prototype:** These were made following the first public showing of the first prototype of the chair by Lynn Jones and Sally Kendall at *The CPHVA Annual Conference* in October 2002. They included amendments to seat mouldings and to the metal gauge of legs (4.7).

4.3 Ergonomics and Anthropometrics

Anthropometry is the practice of measuring the human body; ergonomics is the study of human mental and physical performance in a work or activity situation, where particularly aspects of efficiency or 'fitness for purpose' are analysed. Although definitions may vary, together they provide a useful starting point.

It was envisaged that the breastfeeding chair should be both creatively innovative and ergonomically correct. It should be available for women to buy for their homes and should be standard in maternity units; GP's waiting rooms; the workplace and other public places enabling women to breastfeed comfortably both inside and outside the home. The ergonomic correctness of the chair will be imperative. The measurements taken of women during primary research were used to determine the new ergonomic data for the breastfeeding chair.

Both designers and ergonomists continually need to update anthropometric data, and challenge data that exists. It is important to remember that published data can only provide a guide and that any opportunity to collect and record task specific data, especially where the task has rarely if ever been closely studied in ergonomic terms, should be taken. For example, there has been much published data informing health professionals about correct positioning of both a mother and baby when breastfeeding, yet there is no published data which relates this information to the furniture or the interior employed for this purpose. **That is to say, although there is anthropometric data available, there is no ergonomic data available at all, indeed breastfeeding has never been known to be mentioned in ergonomics studies.** It is for this reason that I decided to investigate dynamic anthropometric data recorded as a result of measuring sample groups of breastfeeding women, always bearing in mind Croney's dictum:

The human body is a very complex three-dimensional form, and it is extremely easy to indulge in measuring it with very little end profit.²

As my interest was the dynamic of breastfeeding when seated, it is necessary to focus on those measurements relevant to that activity.

² Croney, J, *Anthropometry*, Batsford, (1980), p.51

How does ergonomic data relate to the comfort of seats? Stephen Pheasant in his book *Bodyspace* explains that all seats are uncomfortable over time and that comfort is an unreal concept altogether:

All seats are uncomfortable in the long run, but some seats become uncomfortable more rapidly than others, and in any particular seat some people will be more uncomfortable than others. Comfort may also be influenced by the task or activity that the user is engaged in at the time. In other words, comfort (or more strictly the rate of onset of discomfort) will depend upon the interaction of *seat characteristics, user characteristics and task characteristics*.³

These three characteristics or determinant factors of comfort give a simple introduction to the dynamics of the situation to be scrutinised. This is what constitutes ergonomics.

Ergonomics is a term with which designers often avoid and one with which they are becoming less and less familiar as ergonomic teaching is excluded from more and more undergraduate programmes in Britain. Discussing people's sizes in relation to the form and function of an object, in particular a chair is a useful and critical way of ensuring that things 'fit' the people who use them. Encouraging students and designers to initiate their own ergonomic data and further to compare that to the data of others is critical to the success of the design of a chair.

The table below illustrates the measurements of the five case studies from chapter 3 (3.2). Firstly, some fundamental measurements need to be established:

| | height | mother's age | infant age |
|-------------|--------|--------------|------------|
| 1 Carly | 5' 7" | 35 | 12 months |
| 2 Susan | 5' 6" | 36 | 3 days |
| 3 Hattie | 5' 5" | 36 | 6-8 weeks |
| 4 Christine | 5' 5" | 37 | 1-16 weeks |
| 5 Julie | 5' 4" | 36 | 3 months |

For Carly and Julie these were their second babies and they were willing to compare both sets of data from multiple breastfeeding experiences. This may give an indication of differences between first, second and third child experiences. It is not yet known whether this information will be relevant to the design of the chair. The height of women does not influence the most relevant

³ Pheasant, S, *Bodyspace*, Taylor & Francis, (1996), p.52

dimensions when determining sizes for a breastfeeding chair. It is the popliteal lengths as described below which affects the lap height most relevantly.

4.3.1 Seat height

For example, although Carly is the tallest woman in the study, she has a shorter buttock – popliteal length than Christine. It is this buttock - popliteal length indicated as 'A' (Fig 2) and the popliteal height 'B' which help to determine both the seat height and depth of the prototype models.

For the purpose of this study I am therefore most interested in these two critical dimensions of the breastfeeding woman's body:

| | Buttock to knee (Popliteal length) | Knee to floor (Popliteal height – without shoes) |
|-----------|---|---|
| Carly | 425mm | 400mm |
| Susan | 425mm | 375mm |
| Hattie | 430mm | 360mm |
| Christine | 430mm | 355mm |
| Julie | 400mm | 375mm |

As with most naturally occurring phenomena, people's sizes follow what is known as a normal distribution. That is, when a characteristic such as popliteal height is plotted against its frequency it forms a bell shaped curve with the three measurements of the average coinciding. Thus the median value (the middle value when all are arranged in numerical order) is the same as the modal value (the most frequently occurring value), which is in turn the same as the mean value (the sum of all the sizes divided by the number of sizes). Percentile values are a useful way of expressing characteristics of people. They are determined by dividing any number of quantities into 100 equal groups in order of their size, from the least to the greatest in an orderly sequence. Extreme values of size are therefore represented by small or large percentile figures: the smaller or larger the percentile figure the more remote is the chance of the occurrence of that value. For example, 0 and 100th percentiles are the smallest and largest measurements in a distribution. The shape of a bell curve is determined by the standard deviation of the figures collected. A small standard deviation and the bell curve will be tall and narrow; a large standard deviation and the curve will be low and flat. In terms of percentile values this means that with a normal distribution with a small standard deviation the 5th and 95th percentile will be close in value to the 50th percentile. With a large standard deviation the 5th and 95th percentile will be further away.

According to Pheasant in *Bodyspace: Anthropometry, Ergonomics and Design*⁴, the mean average popliteal height of women is 400mm with a 5th percentile value of 355mm and a 95th percentile value of 445mm with a standard deviation of 27mm. The shape of the distribution of the female popliteal height is thus a narrow bell shaped curve with most of the values clustered around the average. It was therefore unsurprising that the statistical analysis undertaken for this thesis found values very similar to those of Pheasant despite the small sample used.

Finding similar values made me more confident about my small sample of women, nevertheless, I decided to measure more women's legs. Together with an MA Furniture Design student, Rose Cobb, we set up a space in the reception area of BCUC where women could measure their own popliteal height.⁵ A seat designed by Rose was provided and next to it, a measuring tape was glued to a baton fixed onto a wall panel. A box was also fixed to the wall so women could post their results into it. Pencils and paper were provided. A notice on the wall informed them to remove their shoes, and showed an illustration of the part of the leg they were being asked to measure. Seventeen women took part in the exercise. The results were as follows:

Popliteal height in millimetres:

390
323
445
480
400
340
375
385
370
420
405
380
410
425
400
340

Taking into account all of the above dimensions, an average seat height for the breastfeeding chair was confirmed using the test-rig (see later, 4.5.1) to be 360mm from the floor to the top of the front of the seat (Two other heights may be offered to women who are unusually tall or unusually short in stature). Probably due to the fact that Croney, also an anthropometrist, has measured so many women, he is suspicious of much designed furniture, especially office furniture of a kind likely to be used by women. Referring to seats generally he states:

⁴ Ibid, p.53

⁵ Cobb, R, *Measuring the Popliteal Heights of Women*. Collaborative primary research with the author, MA Furniture Design & Technology, September 2000 – December 2001, BCUC

Seats are often found to be 457mm high, but this is too high for the majority and too high for a seat for a working position for long periods. 432mm has been recommended, but this is still a height which is excessive for women.⁶

Here Croney discusses optimum heights for office chairs and offers a rare indication that all is not right with chairs used by women. Clearly then, a chair dedicated to breastfeeding women will require of its seat that the optimum height will be considerably lower than most chairs demanding a task or activity.

So then, research suggests that the optimum seat height for a breastfeeding chair for a woman of average height is 360mm. Although research in future testing may dictate otherwise, currently three seat heights are proposed as it is foreseen that women who fall into other percentile groups, that is, those who are unusually tall or unusually short in stature, may require a chair with shorter or longer legs:

340mm 360mm 380mm

To give an idea of what these heights mean in practical terms, we can compare them with seat heights in cars, another application demanding low seat height:

320mm 350mm 380mm

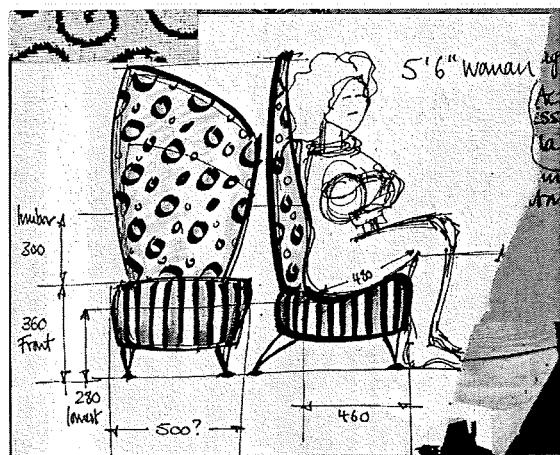
It is clear to see from these comparisons why breastfeeding in the car has been cited by many mothers as comfortable, particularly when there is the opportunity to bring the angle of the backrest to an upright position (Fig 2).

4.3.2 Chair Back

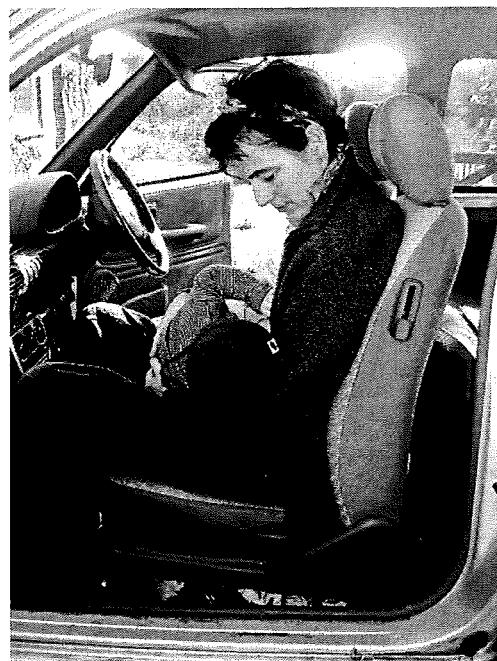
With regard to the positioning of the backrest angle or 'rake' of the chair, the more the rake is increased the less functional the chair will be in this instance. As established earlier in the study, the breast needs to 'fall forward' and to do this the rake of the backrest needs to be set at 95 degrees to the seat⁷ (Fig 3). The desired angle of the back of the woman can also be affected by the form of the seat back. For example, by sculpting or moulding the shape of the seat back the sitter can achieve the desired posture when the overall angle of the back is not set at 95 degrees

⁶ Ibid., p.60

⁷ Fisher, C, interview with the author, Oxford, (2002) (see bibliography, interviews with the author)



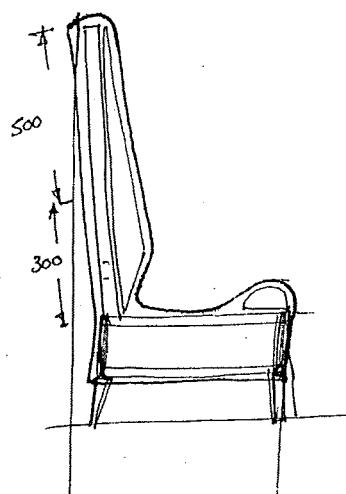
2. It is buttock to popliteal length, indicated as 'A' on the sketch, and popliteal height 'B' which help to determine both the seat height and depth.



Breastfeeding in the car, has been cited by many women as comfortable: it is the popliteal height in relation to the low seat height that is responsible for this perception of comfort.



3. The breast needs to fall forward.



4. The sitter can achieve the desired posture when the overall angle of the back is not set at 90 degree angle.

(Fig 4). The height of the back is not greatly affected by the torso height of the woman and the lumbar support was preferred to be in the same position for all the breastfeeding women who were measured.

4.3.3 Other ergonomic considerations

Breast size did have some relevance to the relationship of a woman's breasts to the position of her lap although this was minimal (Fig 5). Research concludes thus far that:

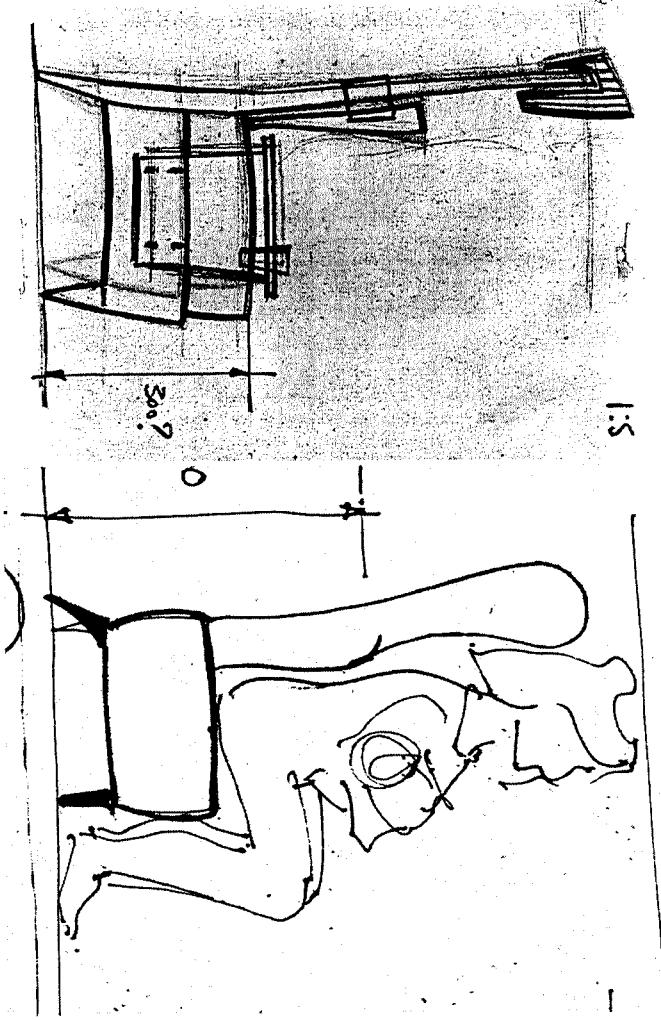
- In relation to the backrest, a positive seat angle will help the woman maintain good contact with the backrest and so counteract any tendency to slide forwards out of the seat. The angle of the back in relation to the seat therefore should be 95 degrees.
- Too steep an angle of the seat will affect the user's ability to stand up and because of the vertical nature of the back discomfort will be immediately apparent.
- If the height of the seat is equal to or higher than the popliteal height of the woman, pressure will be felt on the underside of the thighs and the angle of the 'lap' will not be flat. A flat lap is imperative for the most satisfactory functioning of a breastfeeding chair.⁸
- The height of the backrest is not critical and could be anywhere between the dimensions of 1000mm and 1500mm from the floor. However the position of the lumbar support is the more critical dimension and should be placed between 200mm and 300mm from the top of the seat (Fig 6).

The size and weight of the infant also needs to be considered carefully. Carly's 12-month-old son measured 720mm from head to toe which, relative to the width of the seat of the test-rig is approximately 300mm wider. This is an approximate measurement, as it cannot be recorded as a static dimension as the infant moves quite considerably. When considering arms on the chair, this is one of the factors determining the decision to incorporate one or two armrests, if any at all (or removable armrests). It was the interaction of all dimensions in a dynamic sense when breastfeeding that was the most closely observed dimensions. From studies of these five women, it was established that a 5 degree incline of the seat was the most comfortable, practical and ergonomically 'correct' angle (Fig. 7).

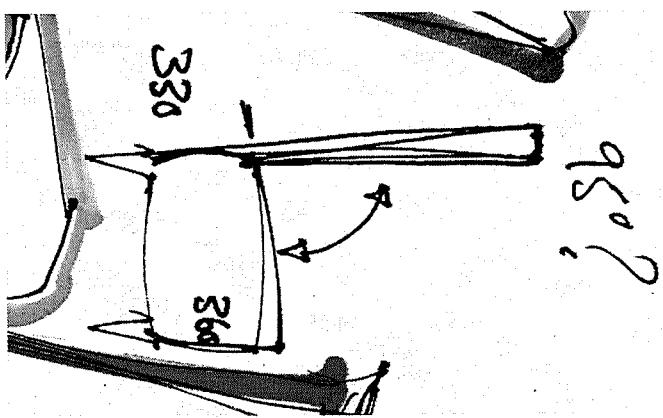
⁸ Inch, S, interview with the author, (2000) (see bibliography, interviews with the author)

5. Breast size in relation to lap height.





6. The position of the lumbar support is a critical dimension.



7. A five degree incline of the seat provides the most supportive position.

Conclusion

In conclusion, all the dimensions of a proposed solution are ergonomically critical but it is the seat height that is the most critical dimension. For example, as observed during testing using the test-rig (4.5.1) cushions can remedy incorrect back rake angle. A footstool could be the simplest way of remedying seat height, or a copy of the *Yellow Pages* (will suffice) as used to solve the problem in *The Breastfeeding Clinic* in Oxford, whereas a chair that is too high will simply render the chair useless and correct breastfeeding posture will be impossible to achieve. If the seat is too low, as Croney observes:

.....the seated posture will assume a forward crouch with most seating benefits lost.⁹

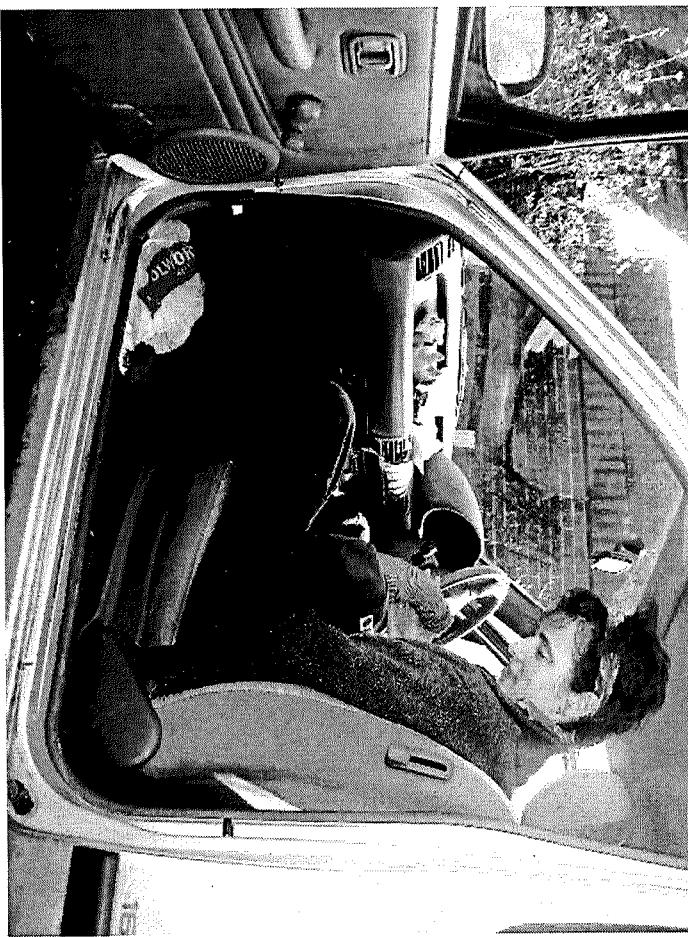
And in this instance, not only the seating benefit but the possibility of successful breastfeeding will be lost too.

So although a breastfeeding chair may be of lower height than many other seats with which we are familiar, it is dimensioned that way to be of optimum functioning potential, as is a car seat (Fig 8).

Surface will affect movement too. Friction will either help or hinder the user in achieving the optimum position. Upholstery can give deceptive impressions of comfort, as discussed earlier in Chapter 3. Chairs made wholly using hard materials such as the Eames's L.C.W chair designed in 1940 are comfortable because the contours of the seat form provide a useful distribution of pressure beneath the buttocks: softness rarely results in satisfactory support. Many chairs like the L.C.W, *The Red Blue Chair* or even the traditional *Windsor Chair* are surprisingly comfortable in the seat despite a lack of upholstery. Therefore it seemed reasonable to conclude that upholstery should be firm rather than soft. Tests carried out using the test-rig (4.5.1) designed to test breastfeeding posture clearly showed that a user should not be able to deform the upholstered surfaces by more than 20mm, otherwise the height of the seat effectively will become too low ergonomically. The shape of the backrest of a breastfeeding chair needs to be less contoured than most office chairs or car seats as the erectness of the angle of the back needs to discourage the sitter from slumping. The angle of the back in relation to the seat therefore should be 95 degrees (Fig 6). The height of the backrest is less critical, but should not exceed 1100mm from the floor. The position of the lumbar should be set by the mother or the assisting midwife or health visitor at a supportive height for her, which, as mentioned earlier will normally be within the range of 200mm and 300mm from the top of the seat.

⁹ Croney, J. *Anthropometry*, Batsford, (1980), p.59

8. Breastfeeding in the car is a good example of an everyday low seat.



Most chairs seen in illustrations depicting women breastfeeding are demonstrably unsuited to this task. From the paintings illustrated in Fig 37, Chapter 1, to the photographs evident in a wide range of self-help books, evidence suggests that no genuinely dedicated and task specific chair for breastfeeding exists. Similarly, publications teaching people to breastfeed advise that pillows be used in almost every recommendation despite the problems they cause (see Chapter 3).

Finally, the placing of accessories will inevitably influence the ergonomics of the chair. As stated earlier, sitting down and breastfeeding is a dynamic activity. Contact with the immediate environment, for example, the surface which holds a glass of water, the surface on which the telephone sits or the siting of the box storing breast pads need to be aligned sensitively in order to optimise the ergonomic performance of the chair.

Sheila Kitzinger, breastfeeding and natural birth expert (see 2.1.1 and 3.3.6) feels strongly that a chair designed for breastfeeding should offer the potential for working at the same time as feeding and that therefore the ergonomics of the breastfeeding chair needs to include surfaces and storage. In my interview with her she observed:

All over the world people do things with their hands whilst breastfeeding: reading, writing, drinking, watching TV, using the telephone, working in many cases to keep the money coming in. When I wrote my first book *The Experience of Childbirth* in 1962 I would write in between feeds picking my daughter up to feed her and putting her down to write the book intermittently. Virtually the whole book was written in this way!¹⁰

In terms of posture, and acknowledging that Chloe Fisher and Sally Inch (3.3.2) might not agree, Kitzinger thought that the mother being able to put one foot higher than the other on a stool for example offers some mothers greater stability. This is a position she had observed on many occasions taken by women in India and Africa, as can be seen in the painting by her (Fig 9). It is also interesting to note that case studies discussed (3.2) described women taking a similar position on the stairs, on the floor or against the edge of a sofa (Fig 10). Some of the paintings discussed in Chapter 2 also show women taking this position.

Referring to the usefulness of the chair she suggested a wicker basket, slotting into the chair somehow, might act as a handy place to put things associated to the work being done whilst feeding, for example, pens, paper and books. This idea corresponded directly with the examples used in Chapter 3 of 'accessoried' chairs (3.5.1).

¹⁰ Kitzinger, S, interview with the author, (Nov.2000) Oxfordshire



9. *Untitled*, by Sheila Kitzinger. Being able to put one foot higher than the other on a stool, for example offers some mothers greater stability.



10. Breastfeeding against the edge of a sofa is a favourite position for many mothers.

We can see that by comparing and contrasting already established ergonomics with those which have evolved from this study, it was possible to inform the design of breastfeeding chairs with a set of new ergonomic information that could be employed usefully by designers of such chairs in the future. The application of this newly acquired ergonomic data was to be applied to the first mock-ups and prototype breastfeeding chairs described later in the chapter (4.6).

In addition to the physical ergonomic data that was collected during the primary research stage, matters of psychological comfort were discussed with each case study and specialist in the field of breastfeeding. 'The chair should be lovely and snuggly' and 'it should feel like you felt in your own mother's arms' were two suggestions from breastfeeding women expressing their psychological preferences. Therefore a woman's first contact with the surface of the chair, the appearance and feel of the upholstery fabric for example, was to be an important aspect of the design criteria. Natural and synthetic fleece and wool composite fabrics were consequently investigated.

4.4 Synthetic Fleece Upholstery

In 2000 a collaborative research project was conducted with *Dawson's Fabrics* in Huddersfield. The aim of this project was to investigate the possibilities of developing a soft upholstery quality fabric using technology already in place for producing fleece fabrics for the fashion industry. Fleece, although acrylic (plastic) is a knitted fabric, much more environmentally friendly than PVC. Fleece uses less energy at the manufacturing stage, is made of thread and is therefore more energy efficient to de-construct. Moreover, fleece clothing can see many life cycles, either being passed on to siblings or sold second hand.

It is porous in nature and more able to breathe with the person sitting on it thus preventing the build up of perspiration and bacteria. The warmer, cosier temperature of fleece materials, caused by its deep pile and long nap also give it high insulative qualities:

The temperature of materials is an extremely important area, especially for people with illnesses who have extreme body temperatures and will as a result have extra sensitive nerve endings and extreme reactions to the temperature of materials used in their surrounding environment.¹¹

¹¹ Mazuch, R, architect for *RTKL UK Ltd*, Interviewed by Smallwoods, N. for her Technical Report, MA Furniture Design & Technology (21/02/01), BCUC

The subtle therapeutic properties of the material was the most evident in discussions with breastfeeding mothers. Their comments inspired this collaborative research to develop a suitable fabric for upholstering this project's breastfeeding chair. The manufacturing process used at Dawson's is called *sliver knitting*. They are one of only three companies in the UK that possess the technology required to manufacture this particular kind of fleece material. Similar upholstery fabrics were designed during the 1950's and were usually composites of acrylic and wool (Fig 11). The first practical advantage of a knitted fabric over a woven fabric for upholstery applications is that it can stretch in both directions so making it much easier to get a quicker, neater fit over structural foam. Covers in particular do not need to be machined with seams and tucks as necessary when using vinyl fabrics and problems like seam slippage and wear are eliminated.

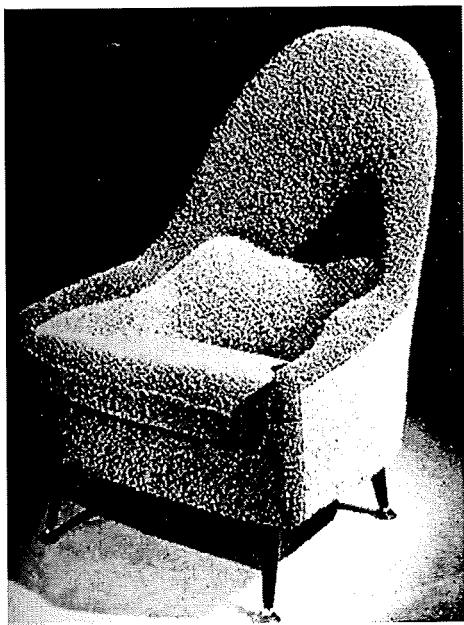
After some consultation with Dawson's it was decided that the heavier gauge of the *Sherper Fleece* would be most appropriate for use on breastfeeding chairs. It is made up principally of two man made fibres: micro-acrylic and polyester. Its properties when used in upholstery include good tensile strength and resistance to abrasion, exceeded only by nylon.¹² It is also stable, resistant to creasing and wrinkling and dries very quickly, retaining its shape so when laundering needs no ironing and very little drying time. Tests by Dawson's to date also indicate its resistance to degradation by sunlight and its hydrophobic character, meaning it does not absorb water and as a consequence is fairly stain and water resistant. Acrylic (acrylonitrile) is blended with the polyester and being a high bulk fibre it contributes to the warm, lightweight, relatively luxurious feel of the fabric. Furthermore it has good resistance to abrasion, water, soiling, staining and degradation by light and perspiration. This is important when specifying upholstery fabric for contract and home use, where furniture is at risk of being affected by such factors.

Dawson's suggested that the fabric could be made more resistant to abrasion by applying a latex backing to it. It was also suggested that by tucking the fibres closer together to make a more dense pile during the manufacturing process, a shorter pile would result, which would perform more relevantly for its application to upholstery.¹³ By adding a backing in this way the fleece would be reinforced so achieving greater tensile strength.

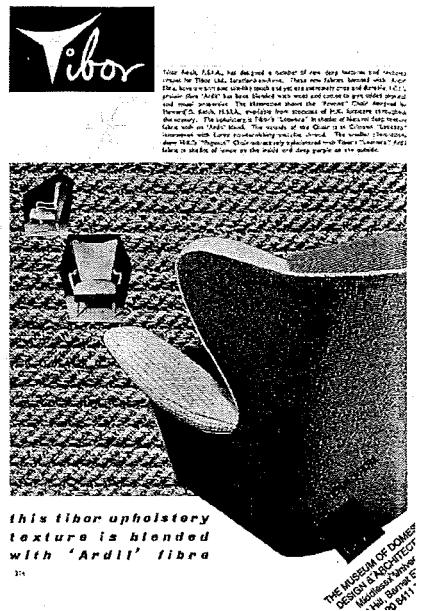
In summary, the blend of the two plastics provides the fleece with very good wash and 'wear and tear' characteristics; the acrylic giving the fabric stronger comfort and warmth characteristics; the polyester contributing to the materials crease resistance. It will wear well due to the strength of the polyester and have good abrasive resistance due to the presence of the acrylic.

¹² Katz, S, *Classic Plastics*, Thames & Hudson, (1984), p.150

¹³ Davis, A, interview with the author, *Dawson's Fabrics*, Huddersfield, (12/2/01)



11. Heals, 1952.



Similar fabrics were developed for upholstery applications during the 1950's and were usually composites of wool and acrylic.



Fleece clothing developed by Dawson's Fabrics in Huddersfield, UK, 2000.



4.4.1 Testing

Having established with *Dawson's* some fundamentals about this fabric, the next stage was to take the thinking to *FIRA* for their comments. *FIRA, The Furniture Industry Research Association*, is one of several testing centres for products designed and manufactured in this country, but is probably the one most noted for it's expertise in the testing of furniture. Situated in Stevenage it claims to be 'the exclusive service provider and driver for higher standards in the furniture and allied services industry'.¹⁴ The most important considerations in evaluating the suitability of the fabric for it's upholstery application was it's physical performance with respect to the following characteristics:

- Abrasion
- Tensile strength
- Pilling
- Resistance to soiling and stains
- Flammability - the only legally required test for furniture, and as such be based on the 1993 *Furniture and Furnishings Fire Safety Regulations*.¹⁵

4.4.2 Abrasion

A chair is under constant abrasion when being sat on. The test *BS EN 12947: Textiles Determination of the Abrasion Resistance of Fibres* is carried out using a *Martindale Machine*, which has pads onto which samples of the fabric are secured and then rubbed against various samples of fine to coarse abrasive surfaces, so imitating real life situations of wear and tear. The machine is left running under supervision. When an appearance change occurs on the fabric the test is stopped and number of machine cycles is recorded. The *Sherper Fleece* was able to pass standards for medium hazard contract furniture, that is, to withstand 30,000 rubs without significant change in surface appearance.

4.4.3 Tensile Strength

The tensile testing machine measures the extensibility and ultimately the breaking force of the knitted fabric. Clamps hold the fabric whilst it is stretched. An autographic chart reader records distortion of the fabric. A bursting strength test as an alternative can be carried out. Testing of the new fabric has not yet taken place, although *Dawson's* are confident that the new fabric would

¹⁴ *FIRA Contract Upholstery – Usage and Specification* FIRA Quarterly Review, (March 2001), p.12

¹⁵ *FIRA Contract Upholstery – Usage and Specification* FIRA Quarterly Review, (March 2001), p.16

pass such a test (A prototype loose cover was made using a sample fabric and further designs are pending review).

4.4.4 Pilling

Most synthetic, high pile fabrics are subject to pilling:

The formation of tangled balls of fibre on the fabric surface.¹⁶

Pilling is most likely to occur during use when fibre fragments break loose, and at one end become firmly attached to the fabric, whilst at the other end they are free. This free end acts as a hook, trapping and becoming entangled with loose fibres. This is pilling. It is most commonly observed on clothing made of fleece material. Presently, *Dawson's* are working on treating the backing surface with various latex based substances so as to minimise the effect of pilling which if resolved will inevitably improve the potential for the fabric in upholstery situations.

4.4.5 Soiling and stain resistance

It is easy to see where most pieces of furniture are prone to soiling: it is on the areas where the head and hands most regularly come into contact with the seat. Although basic soil tests are carried out by *FIRA (The Furniture Industry Research Association)*, where fabrics are tested and assessed against the BS 2663 scale for staining, it can be assumed that lighter colours will soil more quickly than darker colours. However, if the fabric is easily removable and washable without distortion, soiling will become less of a concern and a compromise can be struck between designer, consumer and manufacturer. If for example, fleece covers were designed to be removable they could be washed in the standard service wash of a hospital, along with all the other bed linen, staff uniforms and curtains. Remembering that the fleece has good shape retention and fast drying times, this could be a very efficient process.

4.4.6 Flammability

Upholstery fabrics are most usefully tested in combination with the foam, or other structural material being covered by the fabric. Expanded foam is most commonly used to upholster armchairs today but is an extremely hazardous material in terms of flammability. Hospital furniture is classified as a 'medium hazard' category. The covering would be tested with the specified filling material and with long-term runs i.e. for mass manufacture, seating would be evaluated by 'direct testing' of the proposed combination of materials. Anti-flammability finishes can be applied to

¹⁶ *FIRA Contract Upholstery – Usage and Specification* FIRA Quarterly Review, (March 2001), p.20

improve the ignition resistance of the fabric. These include wet treatments with fire retardant chemicals such as ammonia, but more effectively, according to *Dawson's*, the fleece fabric can be re-engineered to improve ignition resistance by designing a pile dimension which re-directs air when faced with an ignition source. Tests were conducted, primarily with regard to applications for nightwear and dressing gowns, to re-form the fibres to make the fabric ignition proof.

4.4.7 Conclusion

To conclude this aspect of the project it is apparent that there are real advantages for the application and development of the *Sherper Fleece* to upholstery fabric for seating. Developments to make the material tougher and more resilient together with experiments to re-engineer the fibres will further enable the fabric to meet the standards tested at *FIRA*. In summary then the *Sherper Fleece* will be:

- More pleasing to feel and to look at, both psychologically and physically.
- Extremely inexpensive to produce. Currently, the production price of approximately 50 pence per metre, even with the added costs of treatments, backing and laundering, it is still likely to prove far more cost effective than vinyl alternatives.
- Able to survive boil wash temperatures of hospital washrooms.
- Have good fastness to colour and light.
- Flexible enough to be a stretch loose cover, needing fewer seams, and giving a smoother aesthetic.

Having established the advantages of fleece for upholstering furniture for breastfeeding applications, realising it as a more relevant solution than vinyl for the prototyping to come, primary research using fabrics on full sized mock-ups of breastfeeding chairs was the next stage of the research.

4.5 Prototyping

Prototyping is a fundamental stage of the design development of a product. In the case of a chair, it is crucial to make a full size model. Usually, the first full size models that are made, especially those made to determine early decisions about scale and proportion, for example, we would call mock-ups. Unlike a mock-up, a prototype is a piece that has the features of the final production piece. Improvements can continue to be made to prototypes, but they are generally relatively minor. As James Dyson states, the designer is wise to direct the process from start to finish:

From the first sprouting of the idea, through research and development, testing and prototyping, model-making and engineering drawings, tooling, production, sales and

marketing, all the way into the homes of the nation, it is most likely to succeed if the original visionary or (mule) sees it right through.¹⁷

Directing the prototyping of a chair when not all of the component parts are to be made by you, the designer, is a complex juggling act which can involve a broad network of people. For example, during the period between May 2002 and March 2003, I found myself liaising with fifteen different people, working for different companies, with their own agendas: my passion for realising the breastfeeding chair, though shared by some of them, was not shared by all. Convincing the operator of a hydraulic tubular steel bending machine that the legs for the chair needed to be more tapered when he had his own production deadlines to meet demanded considerable interpersonal skills.

Early model-making for this project began in 1998 when a test-rig was first built in the workshops at BCUC and analysed by me at two sites (see 3.2.16). Data collected at that stage provided the first dimensions for the breastfeeding chair.

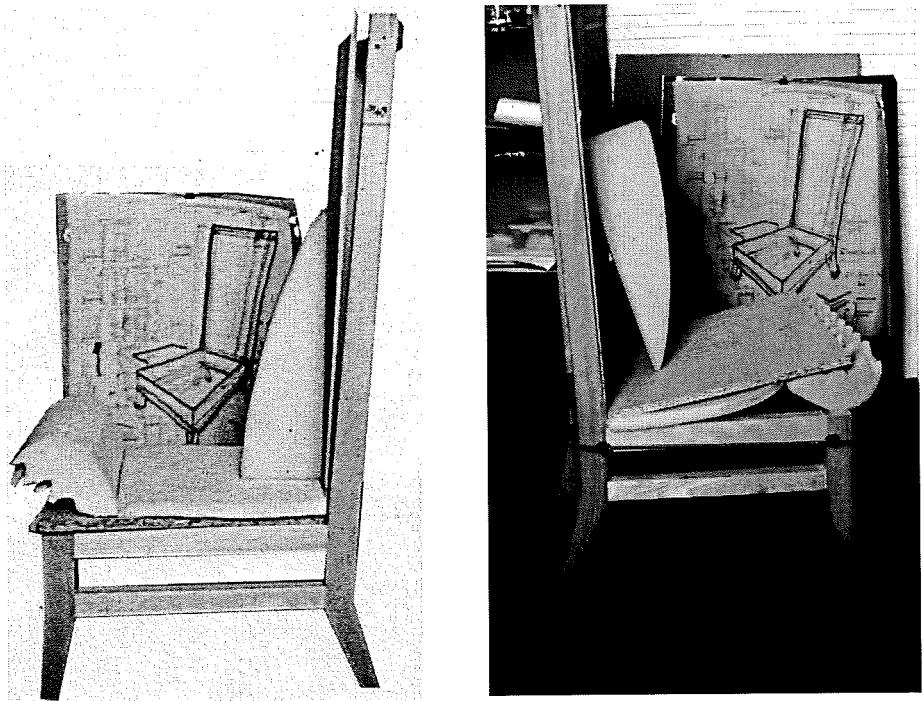
4.5.1 Test-Rig

In the light of observations recorded during primary research (3.2), an adjustable test-rig was made whose purpose was to enable the recording of ergonomic data by using a full size three-dimensional model. Issues of comfort, aesthetics and more general points of practicality were also investigated using this model.

The test-rig had to be sturdy and stable enough to be transported around hospitals and health centres and then sat upon by a variety of sizes and weights of women with their babies. The result was a beech-framed chair which had a selection of seats, foam pads and attachments that could easily be adjusted. The information collected from this test-rig was later applied to other full size mock-ups and to a CAD model.

Fig 12 shows the test-rig, which was designed in 1998 and tested at Site 1 and Site 2 (3.4.1 and 3.4.2). It is a solid timber framed structure made so that it could facilitate the experimentation of different seat heights, back rake angles and lumbar supports. The seat back and seat angles were achieved by cutting a selection of foam pads at different angles so that a mother could favour one over the others (Fig 12). The seat height could be adjusted by either changing the

¹⁷ Dyson, J, *Against The Odds*, Orion, (1997), p. 208



12. Test-rig built in 1998 and used at Site 1 (*Thame Health Centre*) and Site 2 (*The JR Hospital*)



The test-rig defined the fundamental ergonomics of
breastfeeding, *The JR Hospital*, 1998.

seat pad or by adding blocks to the base of the legs should the height need to be amended. All of the measurements were taken as quickly and discretely as possible and were recorded in a working diary so that the mothers would not feel anxious about being observed for too long and in too much detail. Mothers and fathers also made design suggestions as I sketched interpretations (Fig 13). Test-rig research led me to understand for the first time that:

- The 'flat lap, straight back' rule repeated by Sally Inch at Site 1 (*The Infant Feeding Centre, The John Radcliffe Hospital, Oxford*) could only be achieved using a minimum of variables to seat height and back rake.
- Dimensioning particularly of the seat height and back height was critical to the ergonomics of the chair.
- The dimensions of women in relation to their seat were critical, particularly those relating to popliteal height (see 4.3.1).
- The tactile qualities of materials in contact with the skin, such as upholstery fabrics or timber or steel components were imperative to the satisfaction of the user.
- The weight of the chair (as the test-rig was heavy relative to other chairs in the clinic) was a concern which was raised by midwives and support staff.
- Accessories were an issue: women were frequently observed looking for somewhere to hang a muslin square or to safely place a glass of water or a hot cup of tea.
- Some women wanted to put their breast pads (cotton wool pads designed for placing inside the bra cup of the breast that leaks when the other breast is being used to feed from) in a discrete place close to them whilst they fed.
- All women wanted their bag, usually a large handbag, close by.

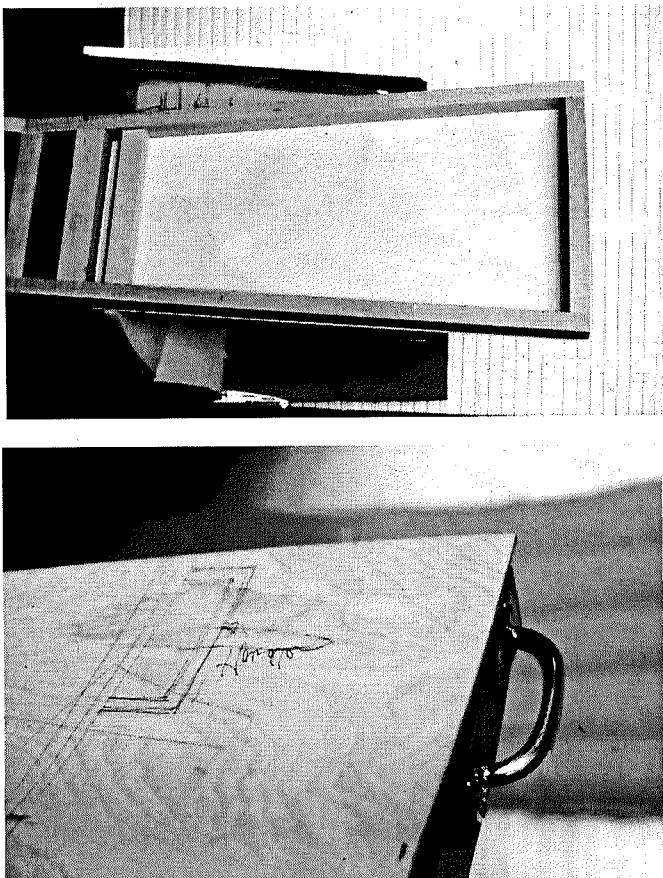
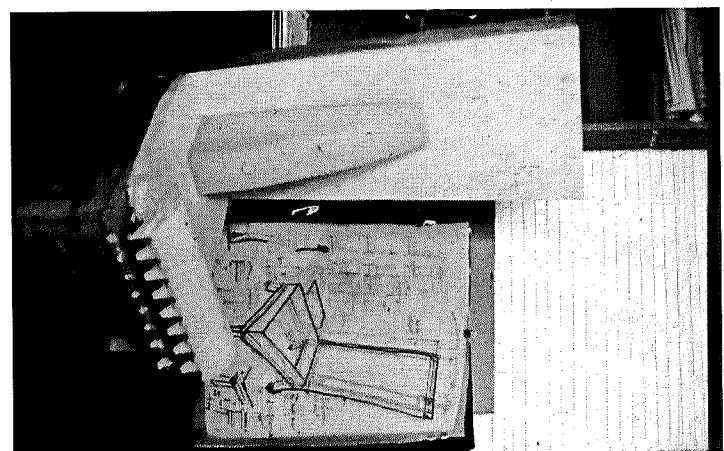
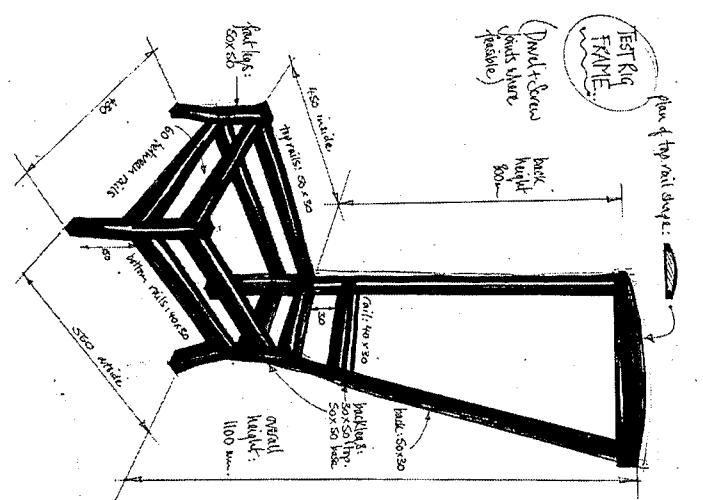
Interestingly, case study women interviewed and photographed at a later stage also raised many of the above concerns (3.2).

Both locations provided ideal conditions for photographing the test-rig in use and talking to women who tried it out. The dimensions for the later models and prototypes came from these early studies. The field notes and sketches taken were fundamental to the design development process illustrated (Figs 12 & 13). CAD drawings were made using the anthropometric and ergonomic data collected.

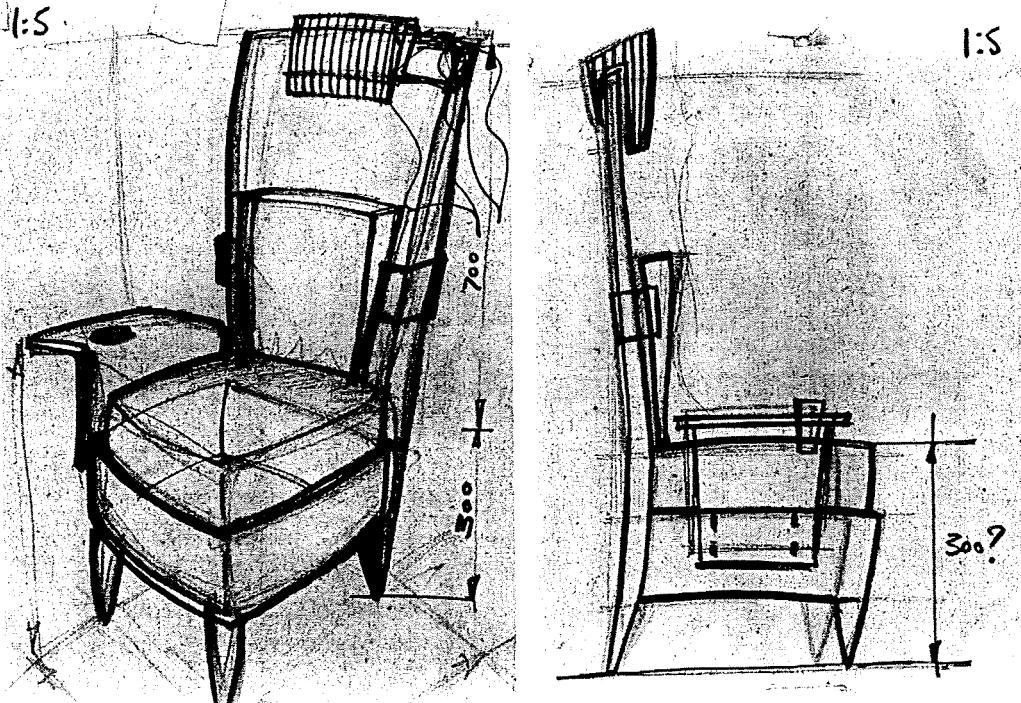
4.5.2 CAD Model

A CAD model illustrated the first visualisation of a potential form for a breastfeeding chair of correct dimensions (Fig 14). Even the ergonomic placing of a drink of water could be calculated

Test-rig, 1998.

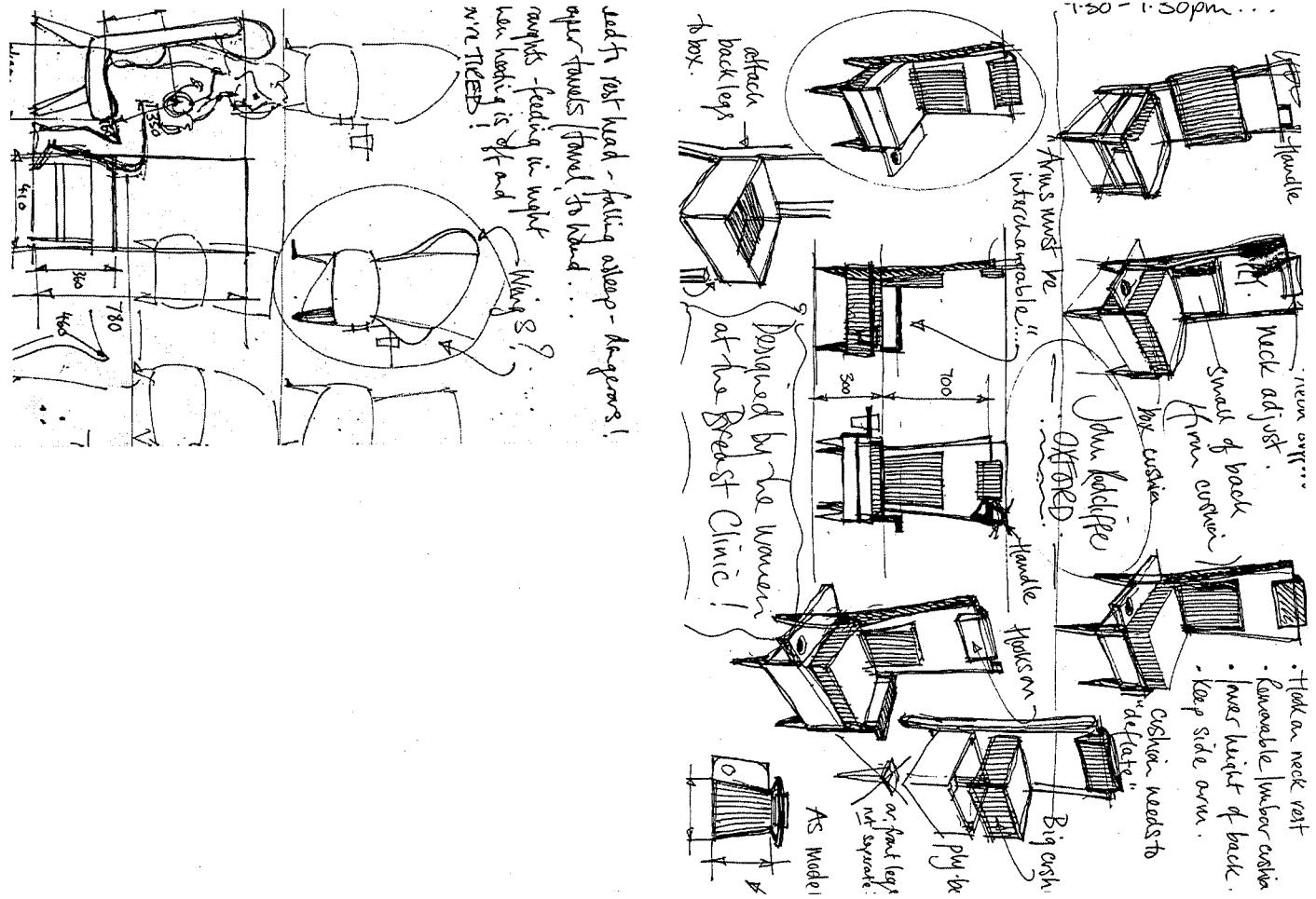


12. Mobility was an issue even at the test-rig stage.



12. Sketches drawn in discussion with breastfeeding women, The JR Hospital, 1999

The back rest and seat angles were achieved by cutting a series foam pads and placing them in a variety of positions.



using this method. The kind of sculpting needed for the foam seat and back could also start to be defined and although the results look rather crude and the chair has the appearance of a car seat, a considerable amount of assurance came from the knowledge that the ergonomics on these images were correct (as indeed are the ergonomics of many car seats in relation to breastfeeding as seen in Fig 2 and Fig 8).

4.5.3 Full Size Models

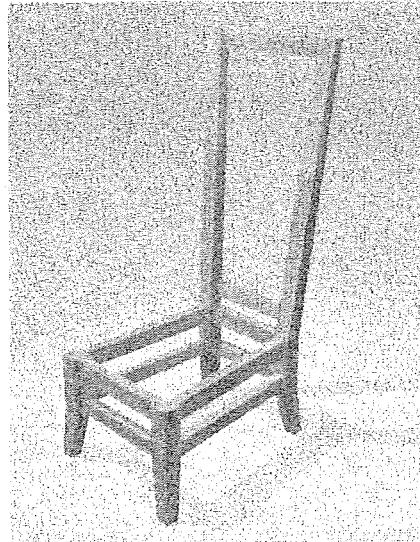
All other full size models were produced between February 11th 2002 and March 12th 2003. They were made using a wide array of materials which included timber, steel, foam, aluminium, cardboard and *Styrofoam* at a combination of workshops which included:

- BCUC wood machine shop.
- BCUC upholstery workshop.
- BCUC multi-disciplinary workshop.
- *Tract* – manufacturer of office seating: metal fabrication workshop, Haddenham, Bucks.
- *Upholstery Trading Ltd.* (a subsidiary company of Tract) High Wycombe, Bucks.
- *And Furniture* – a timber based workshop run by a cabinet-maker, Jonathan Solly, Thame, Oxon.

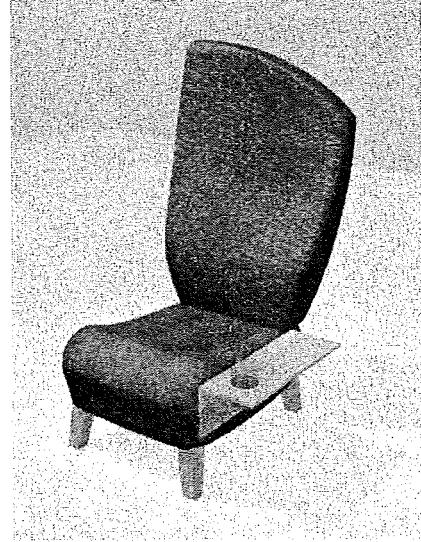
The workshops at *BCUC* are historically timber based. This is where the first models were made and hence were of a timber frame construction. However, as my ideas turned towards other materials for the frame for the chair, I decided to investigate the potential of finding a manufacturer of office seating who specialised in the fabrication of tubular steel and timber laminated chair frames for upholstery to work with me on the prototypes. I had also by this time done some research into the investment these companies make into the research and development of office seating and felt strongly that the potential for mass manufacturing breastfeeding chairs could be realised by one such company. *Tract* in Thame first became involved in this project on May 10th 2002, when I approached them with the idea for a breastfeeding chair. The result of that meeting is recorded below. Other workshops were similarly approached, *Upholstery Trading Ltd* through *Tract*, and *And Furniture*, where other aspects of the model making could take place.

4.6 Prototyping stages

On Monday February 11th 2002, a concentrated period of prototyping and practical research began. A detailed diary of this work is available in Appendix B, which gives an insight



First Test Rig Frame



Frame fully upholstered incorporating head resting height, drinking water provision, and low ergonomically formed seat, to create correct lap position. Formed back shape enables a 90° posture for the back of mother.



Frame partly exposed

14. This CAD model enabled the first visualisation of a potential form for a breastfeeding chair, established dimensions collected from the test-rig made this possible.

into the conflicted nature of designing the breastfeeding chair during that period and the methodology that evolved. The period is divided in to two stages: stage 1: February 11th – May 5th and stage 2: May 6th – March 12th 2003.

Stage 1 represents prototyping conducted during daytime periods when workshops both at BCUC were accessible. Stage 2 is more focussed on the development of the prototypes with a manufacturer.

4.6.1 Prototyping Stage 1: February 11th 2002 – August 14th 2002

Though a few interviews with health professionals working in the field of breastfeeding were conducted during the early part of stage 1, the focus on meetings from February onwards was with specialists in the field of design and prototype making. These included:

- Joanna Moore Marketing and PR, *Vitra*, London
 - Eames Demetrios Charles Eames' grandson, *Vitra*, London
 - David James Lecturer in Upholstery, *BCUC*
 - Jonathan Solly Furniture Maker, *And Furniture*, Thame, Oxon
 - Peter Cornish Furniture Manufacturing Expertise, Head of Department of Furniture and Manufacturing, *BCUC*, High Wycombe
 - Richard Hughes MD, *Tract* (contract office furniture) Ltd., Thame, Oxon
 - Anne Greer Interior Designer and Specifier of Fixtures and Fittings, *Gloucestershire Royal Hospital* (see 3.4.2)
 - Peter Freeman Prototype Maker, *Tract* (metalwork: Haddenham site)
 - Kevin Davies *Upholstery Trading Ltd.*, High Wycombe
 - Roger Webb *Roger Webb Design*, London
 - James Lilley *Seymour Powell*, Design Consultancy, Chelsea

These people were part of a complex process of prototyping. The roles they each played are most accurately reflected in the diary of the time period above (Appendix B). The aim of this section is to summarise that process.

Initially it was thought that a chair of timber framed construction, similar to many of those designed by *HK Furniture* during the 1950's, would provide the most flexible medium for the first full sized chair (see Fig 55, Chapter 3). This would enable me to make amendments easily and to experiment with the frame prior to any of the upholstery commitments that might follow.

4.6.2 Full Size Chair: 1

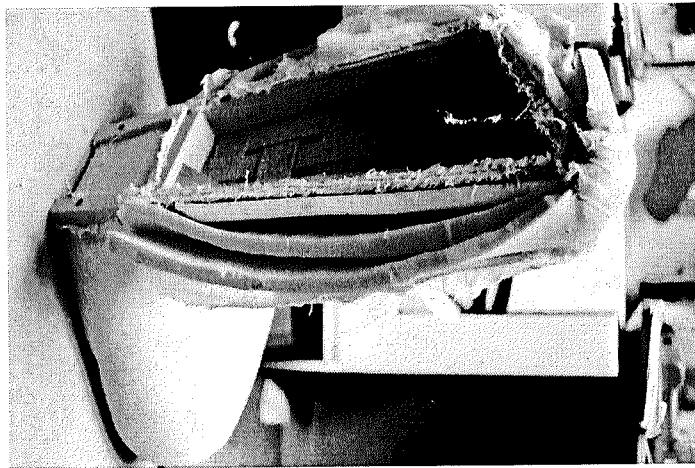
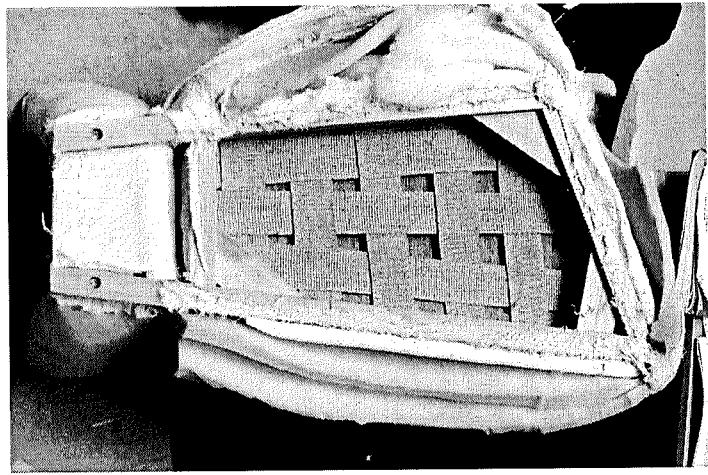
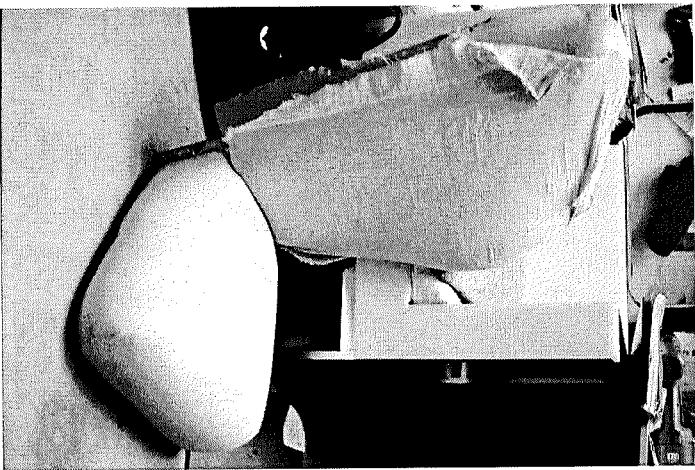
The smallest feasible dimensions from the dimensions collected from the test-rig were applied to this mock-up. It was an experiment into how small the dimensions of the chair could be for it still to function as a breastfeeding chair. Having established the fundamental ergonomic dimensions such as seat height and the angle of the backrest from the test-rig, this model enabled me to experiment with the width of the seat and the height of the backrest (4.3). It also gave an opportunity to try out some initial upholstery ideas and to see for the first time how the overall aesthetic might be. It became apparent that the straight and very square sections of timber were not lending themselves to the soft and inviting aesthetic that was aimed for, and, that the chair was too small for most women. Completion of it was therefore abandoned at that stage (Fig 15). Primary research had led me to conclude that a chair which holds the woman 'as though in her mother's arms' was important to the psychological rationale for the chair, so despite it being useful to have tested upholstery methods, I decided to move on to a second full sized model: this chair was proving to be too small.

4.6.3 Full Size Chair: 2

Having been disappointed with the result of the form of the previous chair, my priority was to achieve a curved, generous and welcoming backrest shape, similar to that suggested by the painting *Mother-Angelina And The Child Diego* by Diego Rivera in 1916 (Fig 45, chapter 2). I also became intrigued by the appearance of the curved-backed chairs I had studied earlier and began to discover more about their construction (see Figs. 52-56). The expertise from three upholstery lecturers at BCUC enabled me to understand more comprehensively the problems of achieving curves in upholstery. In summary, these are:

- Curves can be achieved using curved frame shapes and then by covering the frame in a material, usually a synthetic foam, which follows the curve.
- Foams and other filling materials need to be suspended or supported by another structure or skin: webbing; springs or board materials.
- Moulded foams can negate the need for an upholstery frame, although most often some form of structural frame will be necessary.
- Frames can be made from a variety of materials - plastic, metals or wood - but, arguably the most aesthetically pleasing curves can be achieved using tubular steel or steel rod.
- Lightweight frames can be achieved using all materials but tubular steel tends to provide the most relevant strength to weight ratio for a chair frame.
- Laminated timber frames can offer a less labour intensive method of frame making as once in production, there is minimal joining or welding necessary.

15. Full Size Chair: 1, timber framed.



- Costs of frames vary dependant on the manufacturing processes available, but generally speaking comparatively per metre tubular steel is the cheapest raw material to make an upholstery frame from.

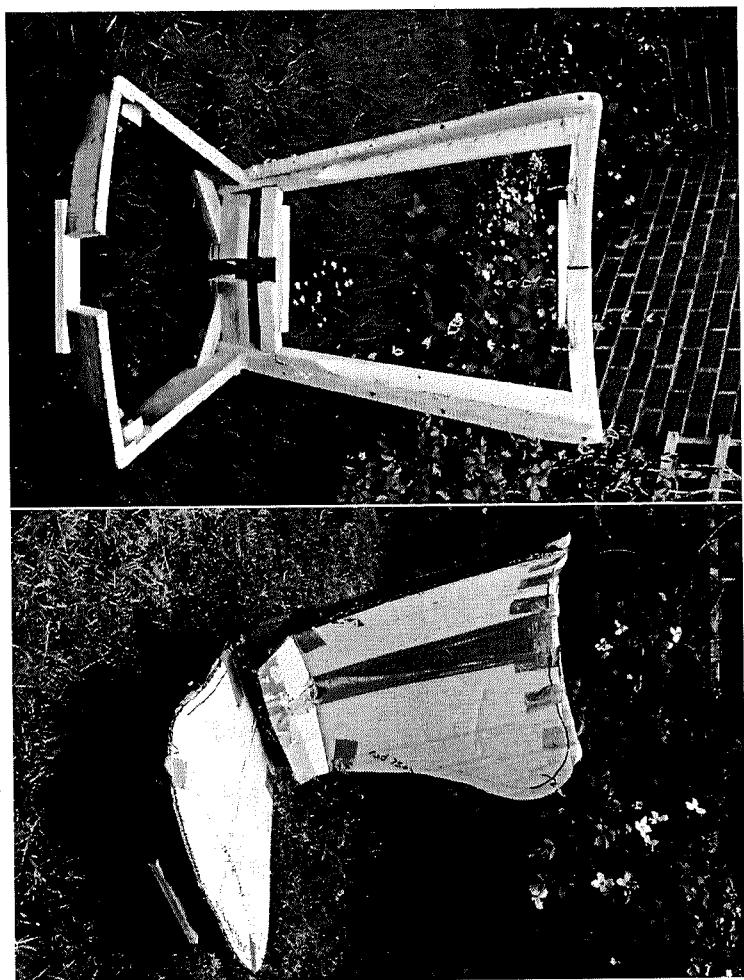
This second frame was constructed using timber and cardboard to visualise and understand the curves that would need to be achieved. Using an old *HK Furniture* (3.5.2) timber chair frame a structure was made that was easy to amend by rearranging the rails (Fig 16). Once an ergonomically and aesthetically satisfying seat form was achieved, the form for the backrest using facets of brown packaging cardboard was modelled. Strengthening the underside of the seat by fixing in a piece of plywood, I could sit on this albeit crude looking model. Being satisfied that the form achieved was ergonomically correct, I decided to replicate my crude cardboard model as a more accurate and wholly timber framed one (Fig 17). Full size drawings were produced and work on the new timber frame began. However, I was frustrated and concerned about both the weight of the beech frame and the traditional method of construction and began to research seating manufacturers in order to determine whether there was a more appropriate and modern way to mass produce a curved upholstered chair relatively cheaply that would also be light in weight. I discovered the following contemporary methods:

- Electrically welded steel rod frames
- Electrically welded and gas welded steel tube frames
- Square section softwood timber frames, jointed with staples and nails (low cost)
- Square section hardwood frames, jointed with more traditional tenon joints and screws
- Laminated timber frames
- Combinations of materials: laminated timber/plywood/tubular steel
- Moulded plastics such as self-skinning foam and *Memory Foam*
- Steel mesh frames

4.6.4 Prototyping Stage 2: May 6th 2002 – March 12th 2003

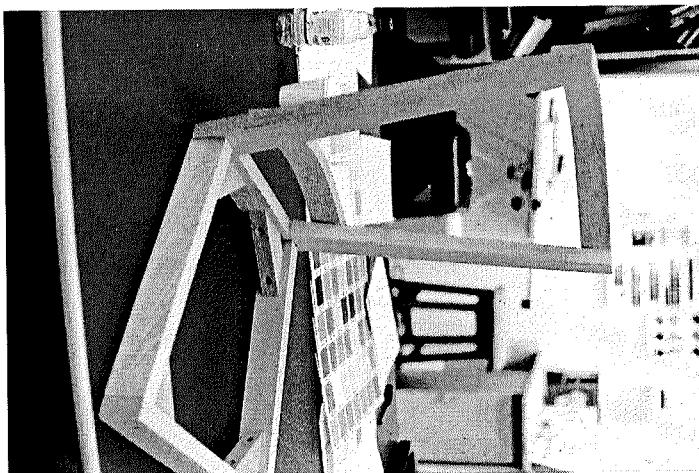
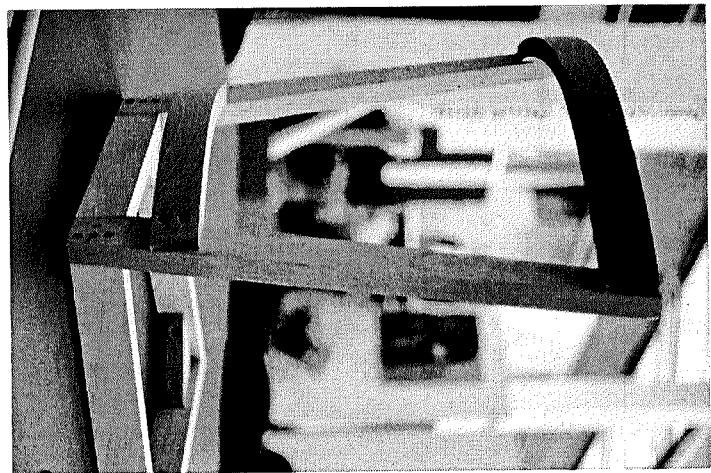
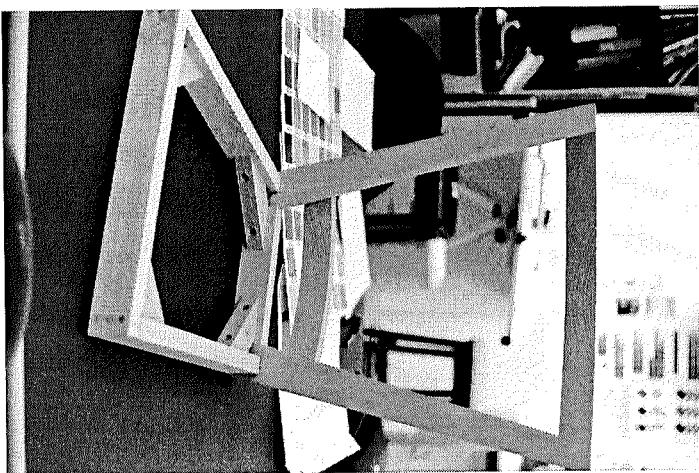
At the same time I was looking for a form that would accept the experimental fleece fabric I had manufactured in collaboration with *Dawson's* in Huddersfield (4.4).

Having preferred the aesthetic achieved by the steel tube frames of Ernest Race in the 1950's (see Figs. 55 and 56), I decided to approach a local manufacturer of tubular steel framed office seating, primarily for advice: *Tract* in Thame. **I took all my sketches along with the full size cardboard model and the findings of my research to my first meeting on May 10th 2002. On May 11th, I was informed that they would like to put the chair in production.** From that date,



16. Using a 1950's chair frame, a structure was made that responded accurately to the established ergonomics. The form was modelled using brown packaging cardboard.

17. Full Size Beech Frame Chair: 2.



the prototyping took a more focussed direction as I learnt about the contemporary manufacturing processes of the factories that would be involved and endeavoured to work with experienced prototype makers at the company. The summary of that first meeting is as follows:

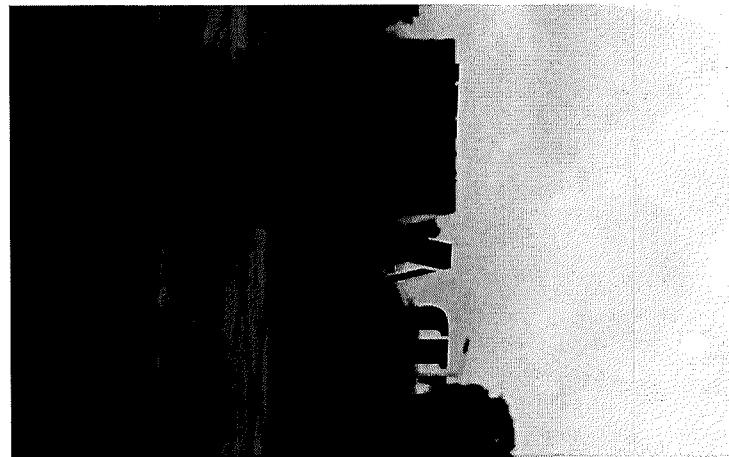
- I was asked to produce a frame only drawing as quickly as possible.
- I was introduced to the idea that foam can be moulded onto a tubular steel frame and then skinned with *Memory Foam* and was shown samples of that process.
- It was confirmed that the upholstery could be zipped down the back of the centre of the backrest for easy cover removal.
- The hanger on the back could be made at low cost out of steel rod or tube.
- Plywood could suspend the foam on the next prototype (first in collaboration with *Tract*).
- Tooling costs for the manufacture of the foam seat pads would be approximately £4000.00.

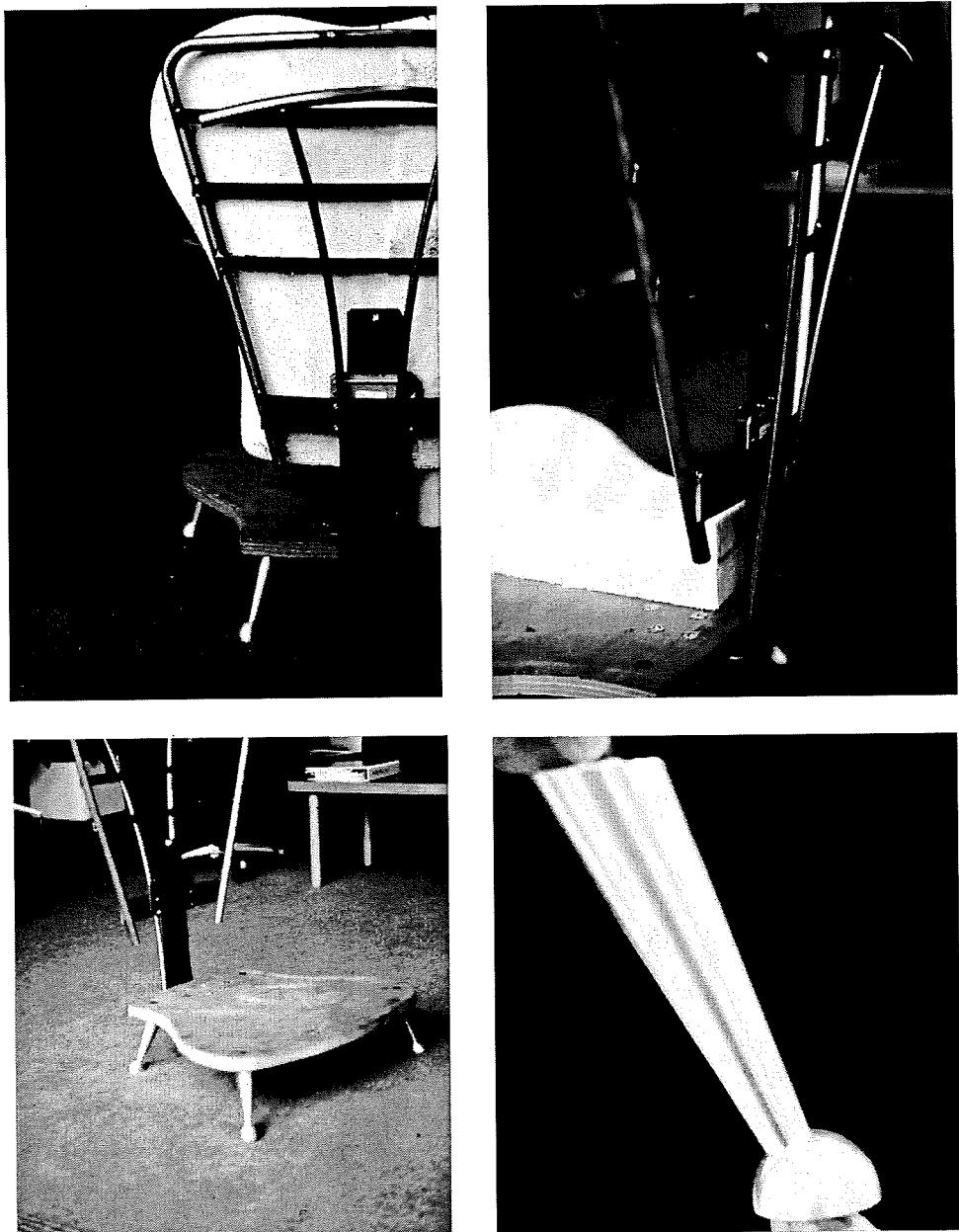
4.6.5 Full Size Chair: 3 (*Tract* Prototype 1)

This prototype was the first to be made at the factory's prototyping facilities. There are primarily two of these facilities: one specialising in metal frame making, the other specialising in upholstery. *Tract* is spread over three sites. These are located in Thame, Haddenham and High Wycombe. There are 85 employees. Running costs are approximately £125,000.00 per month. Their product is contract office seating and at the showroom in Thame the full range of seats is permanently on show (Fig 18). The investment in the design and development of office seating over the past twenty-five years has been remarkable and it is my belief that this investment could be redirected into other forms of seating. For this reason *Tract* proved to be the ideal host manufacturer for a breastfeeding chair. With an already established reputation for the design of office seating they were well placed to make this diversification.

In the beginning the aim was to design a tubular steel chair frame that could echo the ergonomic dimensions of the previous timber versions. The low seat could be most effectively and simply (in production terms) be raised off the ground using four short legs (Fig 19). The height of the legs was dependent on the thickness of the seat pad, as an overall front of seat height of no more than 360mm was imperative. Following discussions about the dimension of the leg height relative to the thickness of the seat pad it became apparent that I needed to establish the thickness of the seat pad first. This was going to incur the highest investment, as high cost moulds would need to be made in which to form the pad. I was informed that if full size models could be made of the seat and the back from which the moulding company could take dimensions (by scanning the model itself) there would be less room for error. Moreover, we could sit on it, which would be a real advantage.

18. At the Tract showroom in Thame, the full range of seats is permanently on show.





19. **Full Size Chair: 3**
Tubular steel frame with the introduction of a ratchet mechanism to raise and lower the backrest. Four short legs raise the seat off the floor.

I decided to hand carve both the seat and the back of the chair in order to establish the form that the foam pads would need to take (Fig 20). Advice on doing such a model was sought from *Roger Webb Design* and *Seymour Powell*, both design consultancies based in London. Their advice can be summarised as follows:

- The specification of the type of modelling foam depends on what it is going to be used for.
- If the mould is to be formed over the rigid foam shape it needs to be solvent resistant.
- If the full size model will be used to digitally reproduce the shape for moulding purposes it is less critical to select resistant foams.
- Foam is supplied in sheet sizes of 600mm x 2500mm x 150mm from *Sheffield Insulation*.
- In order to achieve larger or thicker sections it should be laminated with either a p.v.a. based double sided tape or a p.v.a. glue, which once applied to the surfaces of the foam and held together (preferably in a vice) needs to be left to cure overnight.

When the foam pieces were finished, a frame was made that would be strong enough to sit on and which could also allow for the back to move up and down. The board used to place the foam seat onto made the fixing of the legs positive and sturdy. A timber laminate was placed inside the upholstered back to make it more rigid and more able to take the form of the *Styrofoam* model (Fig 21); as with the Eames' LCW (Fig 49, Chapter 3) formed plywood would provide a curve to 'fit' the body more sensitively. From this model it was decided that:

- A plywood seat panel on the underside of the seat pad would improve the fixing capability of the legs.
- A formed plywood panel moulded inside the upholstery of the backrest would achieve the desired form and aesthetic relatively cheaply.
- The back height could be adjustable using a simple ratchet mechanism, again inspired by the component which connects the seat to the back on the LCW chair (Fig 49, Chapter 3).
- A handle on the back of the chair would have two uses: it would be a place for a muslin square and a place for a visiting health visitor or midwife to hang a cardigan, coat or bag.
- The leg height would need to be 240mm if the thickness of the seat pad is 120mm.

Recommendations at the pre-tooling stage:

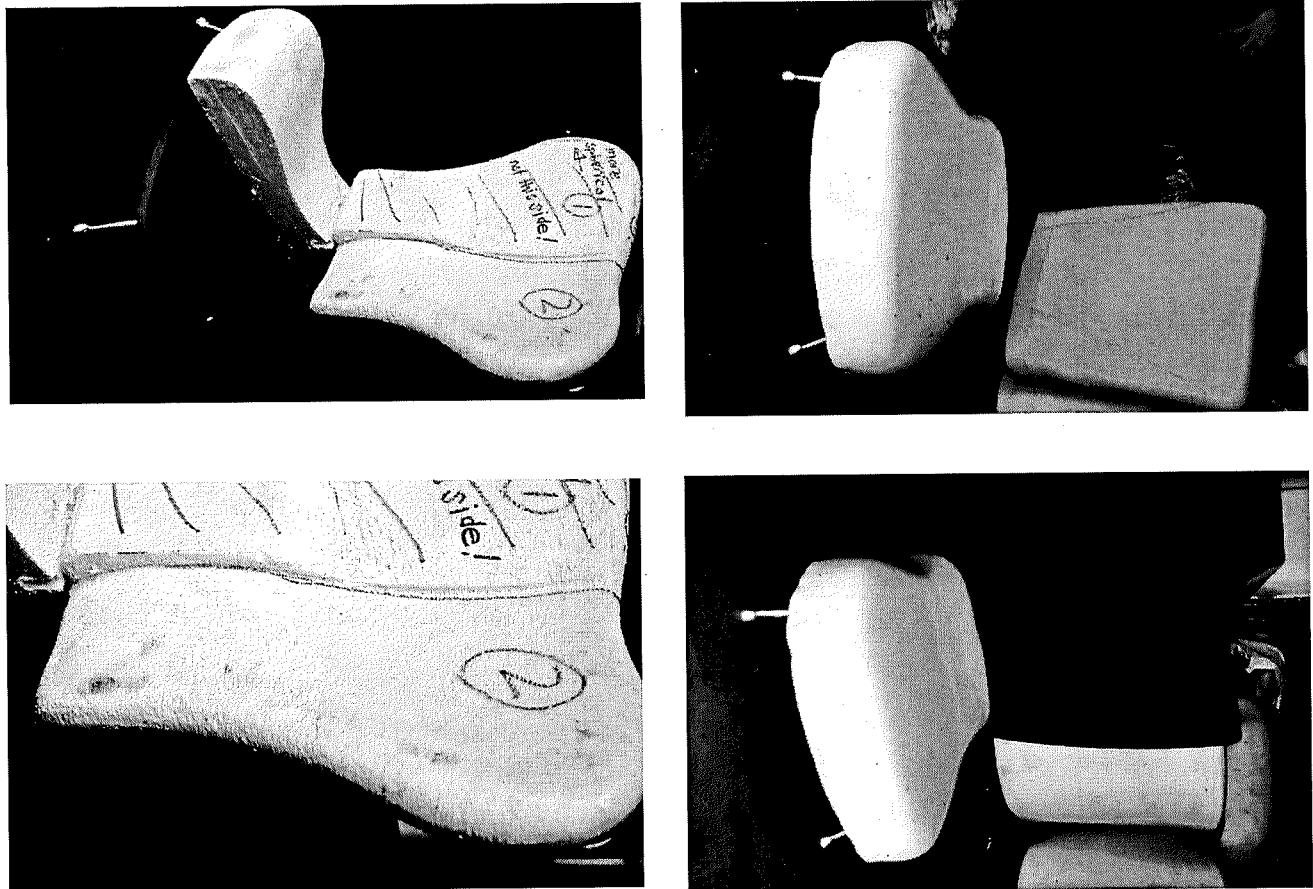
The tooling costs for the moulding of the seats and backs were as follows:

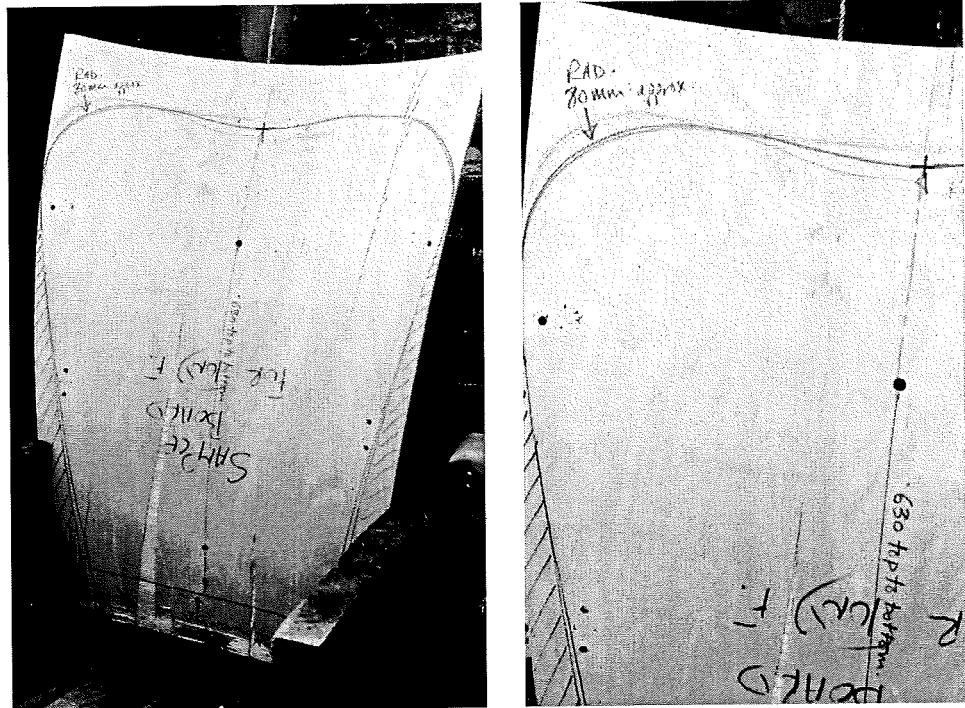
Seat: £8.08 each, initial tooling cost - £3270.00

Back: £7.05 each, initial tooling cost - £2680.00

The staff in the tooling shop at *Interfoam*, a foam moulding company in Bedford, recommended by Richard Hughes at *Tract*, suggested that the best way forward would be to prototype the chair

20. Hand carved Styrofoam full size mock-up.





21. Putting a timber laminate inside the upholstered back improved the curved form of the back rest.

in cut foam built around the frame to begin with to enable us to view and approve the shape and the comfort of the chair. On approval, *Interfoam* could make the mould pattern around the steelwork to the approved shape, referring to the *Styrofoam* model for dimensions. Ten to fifteen working days should be allowed for the production of the wooden male patterns. Any minor alterations can be done at this stage. The glass fibre tools would be completed fifteen to twenty working days from the pattern approval. Tools can then run concurrently. Sample parts are then submitted to determine the shape and to establish the customer's requirements on hardness within three days of tool completion. The production of 150 parts per week is possible from one tool.

Following detailed discussions about moulding capabilities, I was confident that the complexity of curves and the overall form of the seat and the back of the chair could be achieved. Meanwhile, the director's at *Tract* became concerned about the low height of the seat on the latest foam mock up. On inspection, the foam used on this model deformed by more than 100mm when sat on, making the seat height about 80mm too low. There were therefore three things that could be done to resolve this problem:

- The chair leg heights could be increased.
- The seat platform could be made thicker.
- The foam could be made using a more rigid specification of *Memory Foam*.

A compromise was reached: the height of the legs would be increased, slightly more rigid foam was specified and the seat platform would not be made thicker as this would aesthetically make the chair look too heavy.

4.6.6 Full Size Chair 4 (*Tract* Prototype 2)

Whilst the model makers in the upholstery workshop at *Tract* in High Wycombe (*Upholstery Trading Ltd*) worked on the seat height, the emphasis shifted onto the design of the backrest, specifically the contouring decisions and the decision about the lumbar support. Having tutored an MA Furniture Design student, Attilio Cabianca,¹⁸ who experimented with inflatable seating, I was inspired by one of his pieces to experiment with an inflatable lumbar section (Fig 22). Having done a few sketches and tests, one of which included asking people to try sitting on a chair with a p.v.c. lilo strapped to the back of it (Fig 23), I approached the prototype makers in the upholstery workshop at *Tract* with the idea of introducing a built in inflatable lumbar support. This would

¹⁸ Cabianca, A, Major Research Project: *Oxymoronic Furniture*, MA Furniture Design & Technology student, BCUC, (1998-99).

overcome the problem of different women needing different amounts of lumbar support. I was introduced to a component designed for office seating that suited the criteria and could easily be moulded into the back of the chair (Fig 24). These cost approximately £3 each. I was satisfied with the result: the form of the back was almost ready for trial.

4.7 Design Proposal: Full Size Chair 5

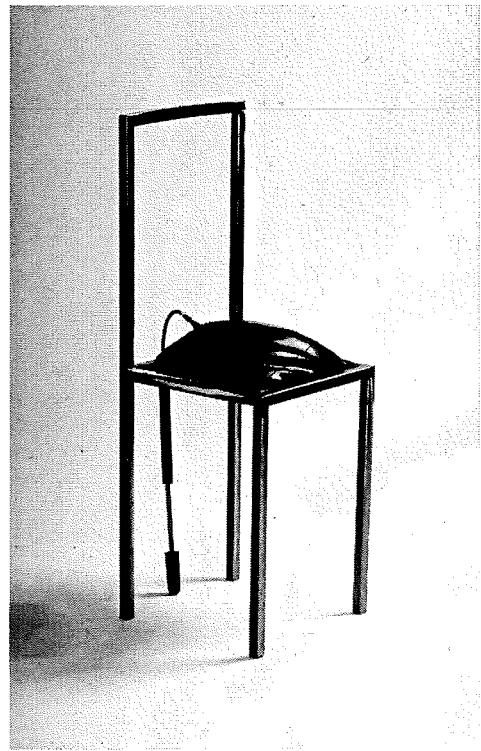
The next prototype would represent a final solution. The breastfeeding chair would be made up of the following components:

- Fully upholstered seat.
- Fully upholstered backrest, incorporating an inflatable lumbar support.
- A ratchet mechanism would connect the seat and the back enabling adjustment to the position of the lumbar support.
- Tubular steel legs would mean that *Tract* could easily offer the legs in different heights.
- There would be a hanger on the back of the backrest.
- A side table would be offered as an accessory and manufactured in the workshops of *And Furniture*.

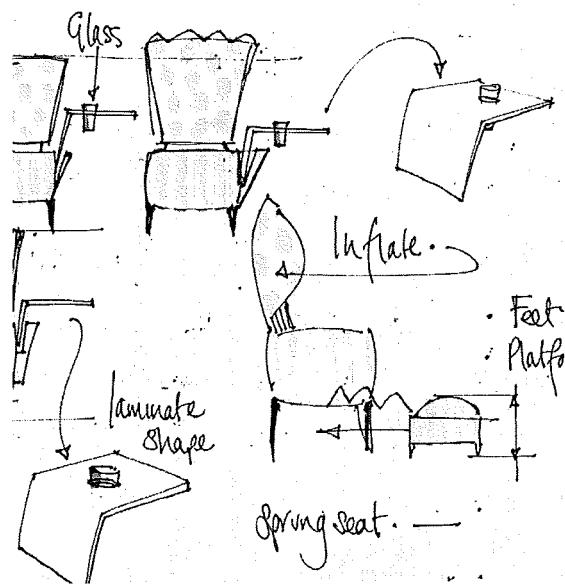
4.7.1 Upholstery and Frame

Decisions on upholstery were also well underway by August 2002. By this time *Dawson's* in Huddersfield had unfortunately gone into receivership. The textile designer with whom I had worked sent the research I had done in collaboration with them. A loose cover was made using the most up to date sample of fleece which accurately represented its aesthetic characteristics, although it would not yet meet the British testing standards required of a contract fabric. One of the few chairs designed for the contract market that has loose covers is *The 'T' Chair* designed by Antonio Citterio in 1998 for *Vitra* (Fig 25). Its machine washable covers are made of 95% polyester. For the breastfeeding chair, other more felt like yet washable fabrics were sourced in collaboration with *Tract*, which are proposed on the final production model (4.4). Those selected on the final prototype are warm to the touch, cleanable and resilient. The range of colours available is contemporary and diverse, giving users a sophisticated alternative to the ranges of contract fabrics currently offered for use in clinics and hospitals. In terms of upholstery detailing, the following decisions were made in the light of trials on Chair 4:

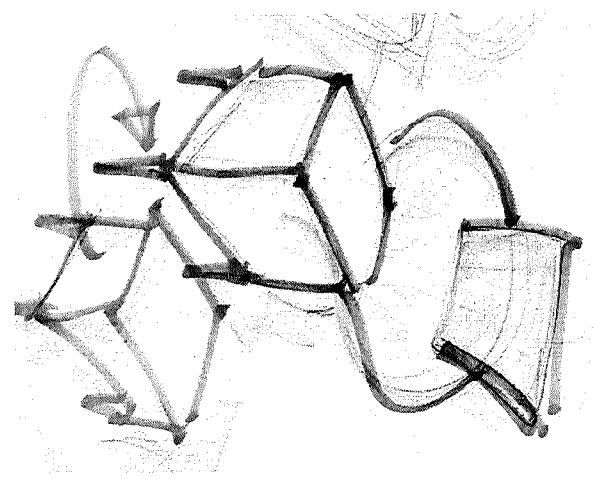
- The seat will be constructed using a plywood baseboard (10mm thick), onto which a foam cut shape will be glued (Fig 26). A sheet of *Memory Foam* (15mm thick), will be rolled over the



22. This Chair designed by Attilio Cabianca, 1999, BCUC, inspired the inflatable lumbar support.



Early sketch idea to introduce an inflatable lumbar support.



Inflatable lumbar support sketch.

23. Chair with PVC lilo strapped to it for testing purposes.



24. Inflatable lumbar support used on final prototype.



25.
‘T’ chair produced by Vitra, 1998, designed by
Antonio Citterio



foam shape creating a snug cavity for the ply base to sit into. Fixed covers will then be fitted by hand over each seat pad and stapled onto the underside of the seat.

- The back is laminated using 9mm ply (Fig 27). It is covered with a 25mm sheet of foam which is glued onto the laminate. The inflatable lumbar support is stapled onto the laminated back prior to the foam being added. Fix covers are again added by hand and stapled along the bottom edge of the back.
- The seat and back will be attached by a ratchet mechanism.
- As the factory could make loose covers to order, they will be offered as an optional extra and will be made from a selection of fabrics chosen by the designer.
- Loose covers will be zip fastened down the centre of the backrest and around the underside of the seat for ease of removal.
- Fixed covers will be double stitched around the seams, for extra strength and aesthetic interest (Fig 28).
- As the seat and the back are separate components, chairs can be specified with different fabrics upholstered on the seat and back. For example, in special care baby units, where women may still be bleeding from the perineum, the seat could be upholstered in a more wipeable fabric than that used on the backrest.
- A cost of £10.00 per metre for the upholstery fabric will ensure the end cost of the chair to the customer will remain under £200.00.

4.7.2 The Chair Legs

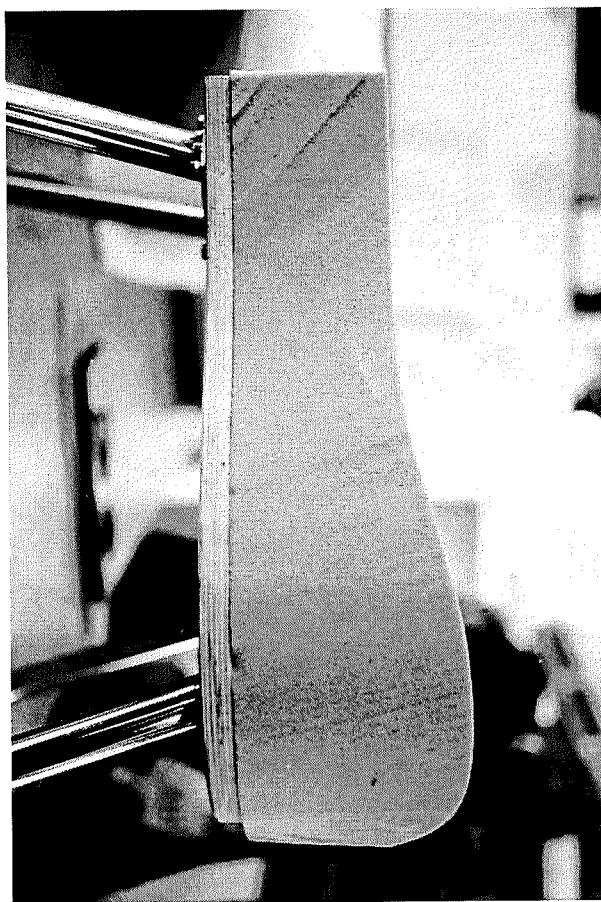
The new chairs of the 1950's illustrated in Chapter 3 were frequently described as being on tiptoe:

The chairs and tables all stand on outspread tapered legs like a ballet dancer on her points. This off-the-floor feeling prevails in all the new furniture. Even pieces of such weight as wardrobes are poised on little legs. The idea is to give a feeling of wider floorspace in small rooms - floating - the designers call it. The housewife welcomes this trend because it makes cleaning easier.¹⁹

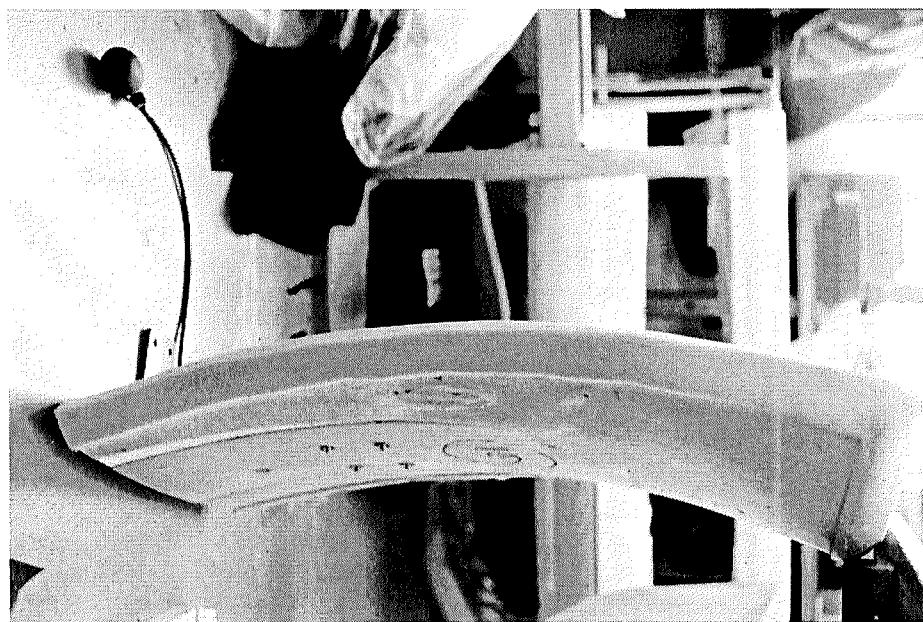
During the early design stages when the mock-ups were being made of timber, the legs were designed to be extensions of the upholstery frame (Fig 29). In this scenario, this was the

¹⁹ Reeder, H, *Progress in Modern Furniture*, The Daily Mail Ideal Home Book, (1951), p. 70

26.
Plywood base board onto which foam is glued.

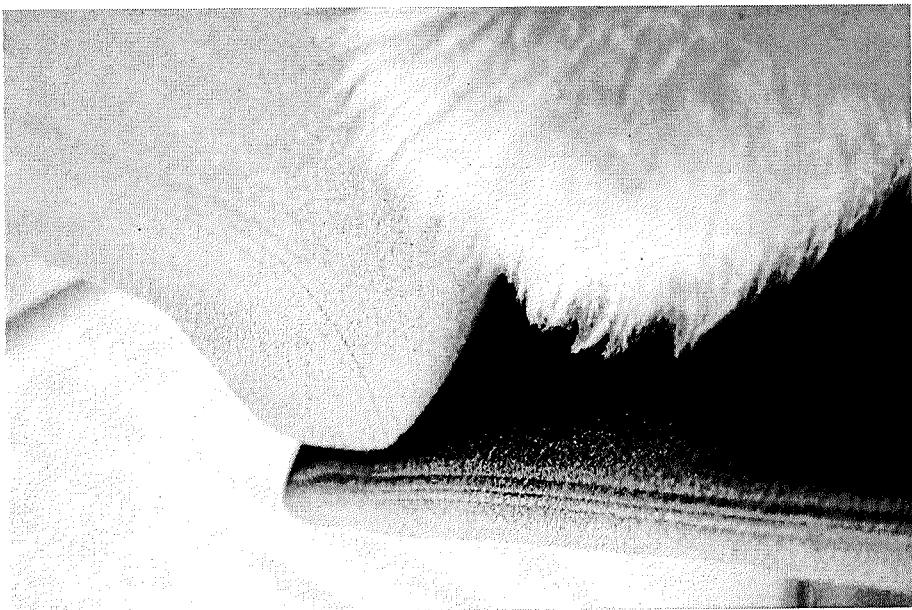


27. The back is laminated using 9mm ply.



279

28.
Fixed covers are double stitched around the seams
for extra strength.



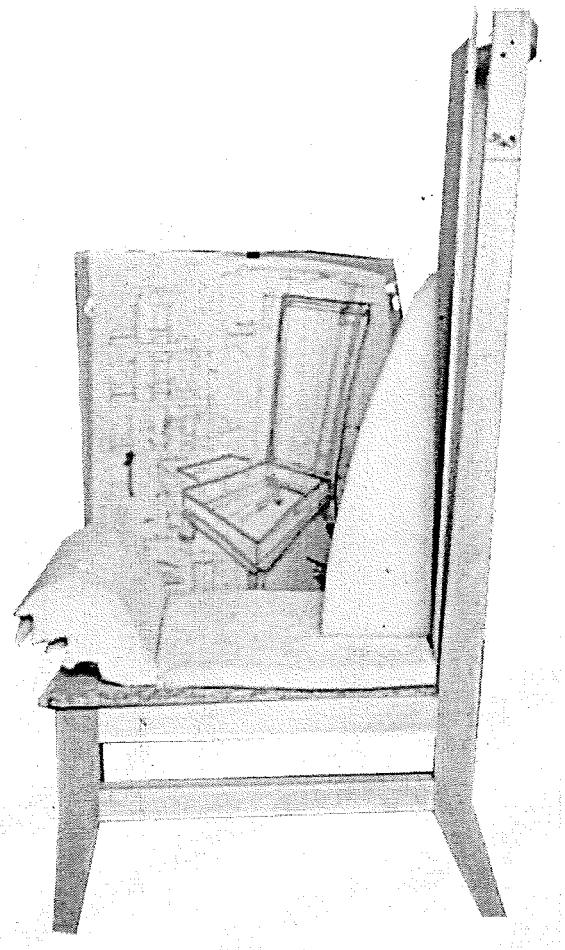
strongest way for the legs to be, as they did not need to be fixed: they were integral to the frame itself.

By virtue of the fact that the strength of thin metal rod or tube is equal to two or three times its thickness in wood, the elegance achievable in metal would not be possible in timber, or at least the tips of the feet would have to be reinforced or capped with metal. At about the time I began to collaborate with *Tract*, I had already started to think about alternatives to the timber legs for the -next model: Full Size Chair 3: (*Tract Prototype 1*). The legs in Fig 19 were made to my specification by *Tract's* suppliers. They are cast aluminium and therefore cost far more than if *Tract* were to produce them themselves in their factory in Haddenham: steel tube being their business, it seemed logical to try tubular steel next. They would be attached with bolts into 'T' nuts into the underside of the ply seat board. Meanwhile the metal prototyping workshop was asked to make four tubular steel legs to a simple specification (Fig 30). However the dilemma now was about the diameter of the tube. The elegance achieved on many of the 1950's chairs I had been impressed by was achieved by either tapering the tube, an expensive process, rare these days, or by using steel rod not often of a thicker gauge than three-quarters or seven eighths of an inch. As a consequence those chairs were very light, easy to move around and extremely strong. The constraint I faced was that it is most cost effective for *Tract* to use a section of tubular steel that is standard to their other chair ranges. It is also much easier for them to offer different leg heights if they use tube that they already stock.

Following many evenings in discussion with directors and marketing personnel, it was agreed that their thinnest available section of tube, one inch in thickness, would be used for the next set of legs. Alternatives including those made of tapered tube and turned beech are still being investigated. However, the production prototype in Fig 31 will have tubular steel legs with plastic (p.v.c) end caps. The chrome finish is negotiable: other finishes such as brushed steel or powder coating will inevitably add to the production cost as they will be treated as 'special' finishes (chrome is standard on most of their other seating ranges). Although a standard leg height will be offered, the customer at a small extra cost can specify two other heights, pre-determined by the designer.

4.7.3 Accessories

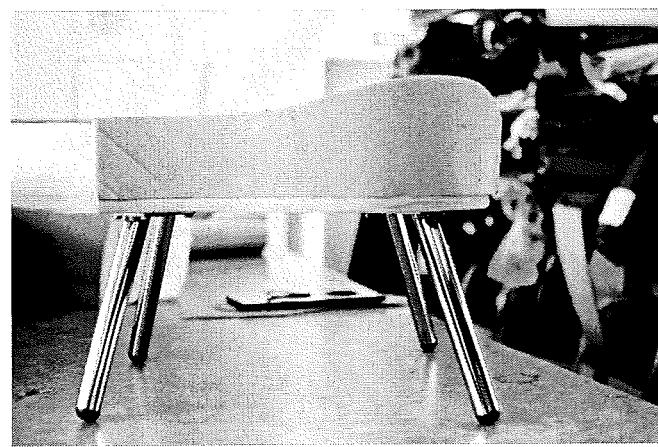
Places for accessories evolved from the primary research as an essential provision. The evolution of the places for a drink of water, a muslin square and things such as breast pads, breast milk collection cups, the remote control for the TV or snacks, is summarised as follows:



29. When the legs were integral to the frame, apart from being heavy, they did not echo the desired effect of a 'ballet dancer on her points.'



30. Tubular steel legs can easily be made in different height sizes if a lower seat height is desired.



31. The production prototype will have tubular steel legs with injection moulded PVC end caps.

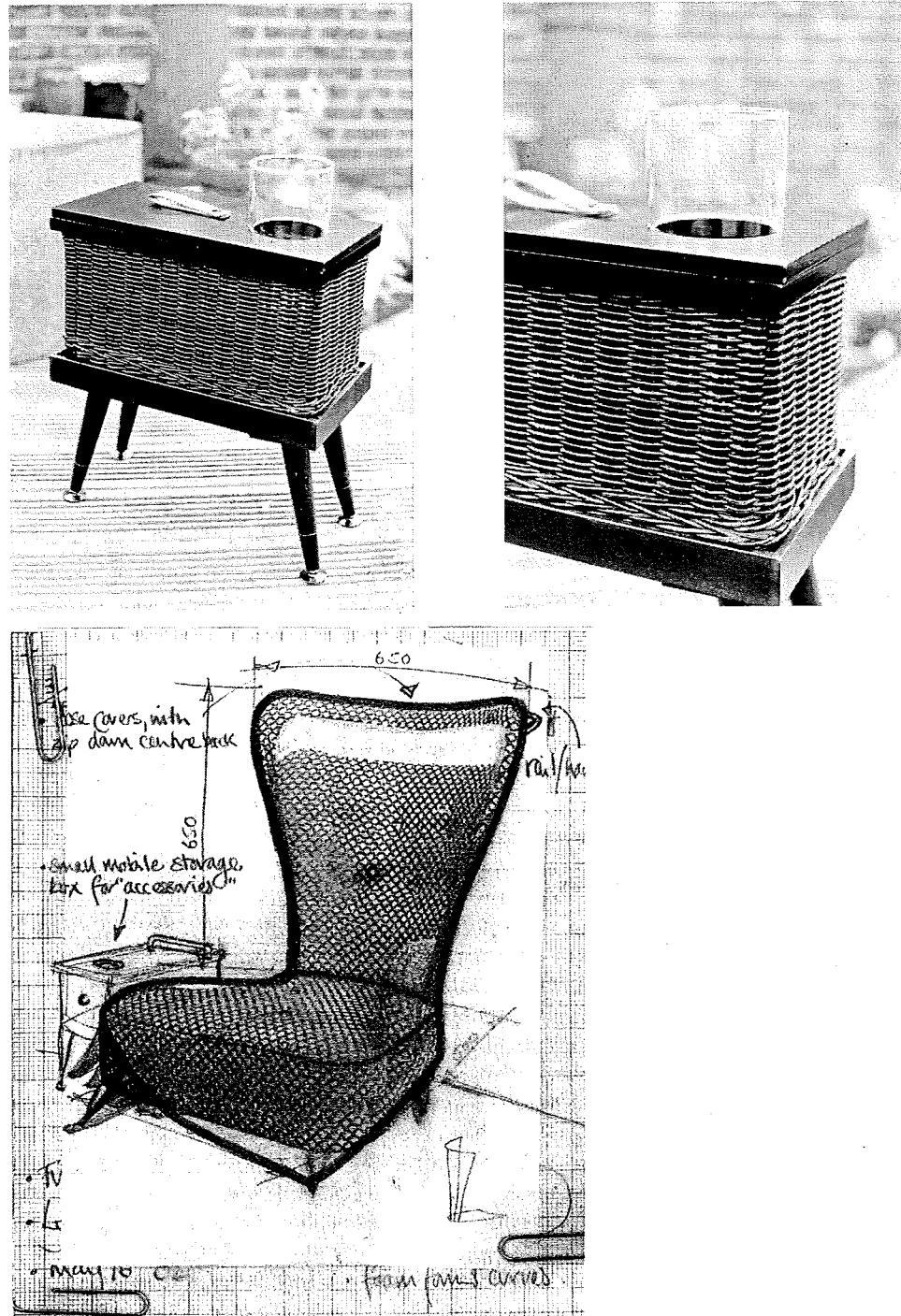
- The majority of experts and women sampled felt concerned that having a side table attached to the chair would obstruct the mother.
- All women sampled requested a safe place for a glass of water.
- Storage was imperative.
- A hanger for the muslin square could also function as a place for the mother's or the health visitor's coat, bag or cardigan.

It was decided that a side table should be designed as a physically separate but complementary piece of furniture. It would need to be stable, lightweight and easy to move out of the way by the mother whilst holding her baby (Fig 32). A hole in the top big enough to hold a one pint glass or mug would prevent the mother from knocking over her drink. The storage capacity of the unit would need to be big enough for those accessories observed as essential from the primary research (3.2.7). It would need to be easy to clean, preferably with a wet cloth and easy to produce in the workshops of *And Furniture* (a timber based workshop located in Thame). The first prototype was produced using a woven basket (as had been preferred by Sheila Kitzinger, 3.3.6) adapted by adding tapered legs to co-ordinate with the chair and an M.D.F top with a hole in it for holding a drink. When this was shown at the *CPHVA Annual Conference* in October 2002, all of the midwives and health visitor's there gave a positive response and were particularly pleased that it was not attached to the chair. A second prototype is now underway (Fig 33).

A hanger was designed for the muslin squares to hang from. It is also a useful place for either the mother or a health visitor to hang a bag or a coat. This is made of oval shaped (profile) steel tube attached by a circular plate welded to a rod attached to the tube (Fig 34). This plate is then screwed on to the back of the chair after it has been upholstered (Fig 35). The detailing on the upholstery allows for the back cover to fit around the disc snugly. Currently the tube used for the hanger is being mocked-up to see whether it can be made lighter in weight. Thinner gauges of steel tube are being produced at *BCUC* and sampled at *Tract*.

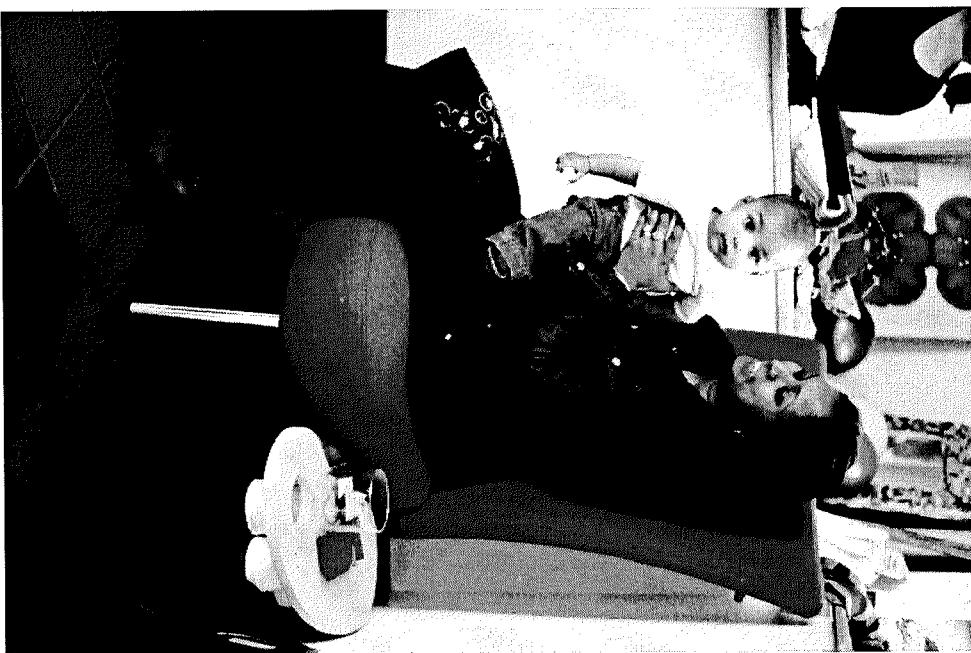
4.8 Conclusion: Chapter 4

The design methodology evolved systematically out of a desire to respond to the research three dimensionally as quickly and effectively as possible. Design is all about communication and the outputs of this methodology were to become the primary communication tools with industry. Drawings, test-rigs, models, photographs, sketches and computer visualisation were all vital activities to the realisation of the chair proposals. In most situations sketches took the traditional role in research terms of field notes. For this reason those field sketches that have not been included in the main body of the text are included as an appendix at the end of the thesis

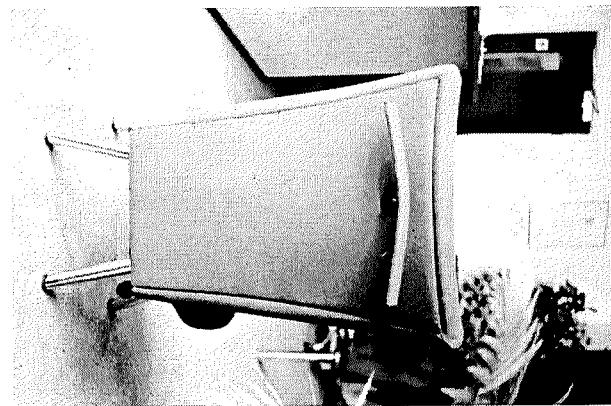
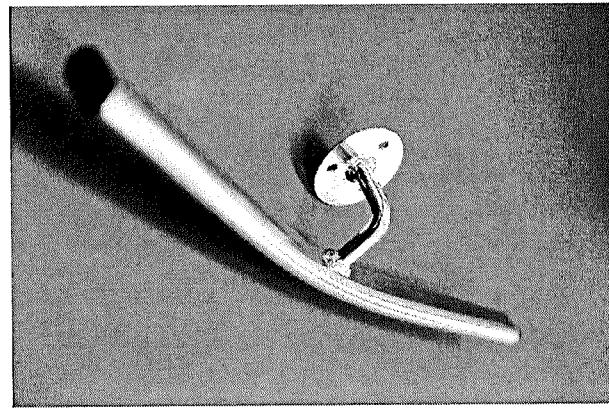
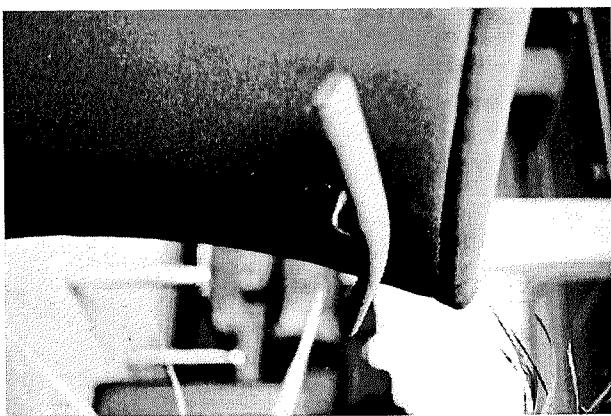


32. First prototype side table: the hole in the top will safely hold one pint glass and the storage capacity is big enough for accessories, as defined by the brief.

33. Second prototype side table with top shaped to echo the seat curve on the chair. Bromley by Bow Centre, Baby Clinic, London March 2003.



34, 35. Hanger for muslin square, bag, or coat.



(Appendix A). This method proved particularly effective when interviewing women from other cultures whose first language was not English. For a designer this is, on reflection, an excellent method to choose for visits and interviews, particularly during the prototyping stages when many amendments are taking place, often at a fast pace. On many occasions it was a fully dimensioned scale sketch that was taken to the prototyping workshops, rather than a full size technical drawing: it is a quick and effective communication tool.

The ergonomic study became pivotal to the research. This will provide one of the most original and useful outputs, enabling designers to apply the data and produce any number of variants of style or fashion: adhere to the ergonomics and the chair will function, whatever its style. The test-rig was thus the first, physical, full size demonstration of ergonomics. Like sketching, it was an immediate way to communicate proportions and scale. It also provided an opportunity to discuss tactile and aesthetic qualities of the chair: various fabrics, foams and finishes could be sat upon for the first time enabling women to express their psychological reaction to them.

The later mock-ups provided similar opportunities. The prototypes made in collaboration with *Tract* offered opportunities for advice of a commercial nature and the implications of the use of one material or manufacturing process over another became more evident.

Collaborating with industry does bring with it constraints that can feel stifling, but there is nothing stopping a designer suggesting improvements outside the boundaries of a particular manufacturing process. ‘The only way to keep possession of your invention is to keep strengthening it’ says James Dyson, who adds:

Breaking the mould will upset people. Challenging sitting tenants will be tough. It will take longer than you ever imagined. Ten years of development? Do you fancy that? And then negotiations on a knife-edge, a shoestring, and hanging by a thread? It will take balls.²⁰

It ought to be said that all personnel at *Tract* proved to be extraordinarily supportive and sympathetic. The sales force and the management team there were all male yet they believed from the outset in the fundamental philosophy of the chair. They would tell me of how they talked about the chair with their wives at home and how it helped them to understand the importance of comfort when breastfeeding. I was provided with experimental fabric, access to expertise and positive support by *Dawson’s* at a crucial stage in the development of the design project. The research done with them inspired the fabrics that have now been selected for the chair range offered by *Tract*. Certainly, learning about the testing of fabrics at testing centres such as *FIRA*

²⁰ Dyson, J, *Against The Odds*, Orion Business, (1997), p.209

added technical information which could be vital to others designing chairs of a similar contract nature.

The collection of full size models produced during this development period provided an extensive example of design development, which at exhibition would communicate a comprehensive sequence of practical research methods:

- Sketch development / Field sketches/ Field notes
- Test-rig
- Photographic evidence of test rig in use
- CAD development drawings
- Mock-ups
- Scale drawings
- Full size technical drawings
- Component mock-ups (legs; hanger; ratchet mechanism on backrest)
- Mock-ups of inflatable parts - backrest
- Mock-ups of plywood - backrest
- Foam seat and back mock-ups
- Side table mock-ups
- Collection and collation of materials samples (fabrics; foams; metals; laminates)
- Metal finishes - experimentation
- Loose covers - experimentation
- Fitted covers - experimentation
- Production mock - ups (5)
- Final production prototype
- Photographic evidence of production prototype in use
- Amendments to final prototype

In 1998 I was genuinely surprised that no chair for breastfeeding existed. Having established how breastfeeding is taboo in the UK, the fact that a manufacturing company on my doorstep would be willing to risk putting my idea into production for the UK market seemed incredible. Five years later (a relatively short time in Dyson's terms) the prototyping process has reached a stage whereby Full Size Chair 5 is ready for commercial production (Fig 36). It will cost £197.00 (net price) and can be specified in a wide range of cleanable fabrics with different seat heights available on request.

The chair is a celebration of the development work that has gone before it. Breastfeeding women provided the inspiration for the research and development work and now it is time to appraise the result. I am surprised to have travelled this far in such a relatively short period of time.



36. Chair ready for commercial production, *Bromley-By-Bow Baby Clinic*, March 12th 2003.

The Breastfeeding Chair



The Breastfeeding Chair

Sales:

*Upholstery Trading
Unit 24, Oakridge Road
High Wycombe
Buckinghamshire
HP11 2PF*

*Telephone: 01494 445324
Facsimile: 01844 215486*

or

Lynn Jones: 07739 367345

The Breastfeeding Chair - is stable, light and ergonomically designed for the specific use of breastfeeding.

Uniquely sculptured seat and back:

- *the seat has under thigh support and is comfortably low to enable ease of nursing*
- *the back has an integrated inflatable lumbar support and an easy lift back height adjustment*
- *handy fixed accessory and coat hanger to back*
- *the Breastfeeding Chair comes in standard ranges of cleanable fabrics and various materials are available on request*

Designed by: Lynn Jones MA

| Breastfeeding chair | A+ Interface Maritime Plus | B Gabriel Europost | Overall Width mm | Overall Depth mm | Overall Height mm | Seat Height mm |
|---------------------|----------------------------|--------------------|------------------|------------------|-------------------|----------------|
| | £197 | £219 | 600 | 600 | 1050-50 | 400 |

Conclusion

It is clear from the research that there are many variables which affect a mother's decision to breastfeed but a significant factor in the discontinuation of breastfeeding is infant distress, maternal distress, and maternal pain and discomfort caused through poor positioning. Poor positioning is related to the furniture that mothers use whilst breastfeeding. This includes that supplied in hospitals, GP waiting areas and clinics as well as domestic furniture. It was this observation that inspired the CPHVA, *The Community Practitioners and Health Visitor's Association*, to find a furniture designer to investigate the feasibility of a breastfeeding chair in 1998.

This thesis has examined the feasibility of a breastfeeding chair. Having established that a breastfeeding chair is feasible a chair has been designed and manufactured.

This conclusion has been written when sample chairs are about to be put into baby clinics around the country. In collaboration with midwives, health visitors and breastfeeding mothers feedback will be collated and used to inform further research. The research and design process which began in 1998 has travelled from 'the first sprouting of an idea' to a point where the idea has been realised and can be appraised by its users¹. Dyson's observation bears repetition:

From the first sprouting of the idea, through research and development, testing and prototyping, model making and engineering drawings, tooling, production, sales and marketing, all the way to the homes of the nation, it is most likely to succeed if the original visionary (or mule) sees it right through.²

I have seen it through and am convinced that the purpose and the aim of the study has been achieved. To address the original purpose of this project:

Aim: The purpose of this study was to establish the need for a breastfeeding chair and then to design a chair to respond to that need. There can be no doubt in the light of the research conducted that a breastfeeding chair is needed and that this author believes she has provided a chair to meet this need.

¹ Encouragingly one client observed of the chair: 'This is the most supportive chair I have ever sat in.' Health Visitor, *Bromley By Bow Baby Clinic*, (March 12th 2003)

² Dyson, J, *Against The Odds*, Orion Business, (1997), p.208

Research Questions: The research questions originally posed have been answered within the context of the text. However, a more succinct summary might help to indicate opportunities for further development. The original research questions were:

- Q. What is the perceived need among women themselves for a chair to support breastfeeding?**
- R.** The perceived need for a chair to support breastfeeding is clearly evident. All breastfeeding women interviewed and experts in the field understood and supported the need for a chair. Even those women who did not breastfeed felt that breastfeeding chairs should be available in hospitals and clinics certainly during the first few days after birth. When learning to breastfeed, for example, some of the Bangladeshi women, trying out the chair in March 2003 at *The Bromley By Bow Centre* (Fig 36) stated that they may have more seriously considered breastfeeding, had chairs been put in the baby clinic there earlier. It seems from the research that during the first few days following birth the chairs would be at their most useful and influential.
- Q. What is the current availability of such furniture in areas where women might be expected to breastfeed both in public areas and in the home?**
- R.** Although some mother and baby rooms have single chairs in them, which could be used for breastfeeding, furniture designed for breastfeeding does not exist. In the home, mothers continue to adapt the furniture they have and in hospitals and clinics staff are seen to adapt chairs that were originally designed for other purposes.
- Q. What is the perceived need for such a chair among professionals and other experts in the field?**
- R.** *The Invest In Breast Together Partnership* originally proposed the idea that a chair might be able to promote breastfeeding in 1997. It was their research that suggested that chairs might be causing positioning problems for breastfeeding women. Since then, all professionals and experts in the field encountered have wholeheartedly supported the need for such a chair.
- Q. What ergonomic data is required for the design of a breastfeeding chair?**
- R.** The ergonomic data revealed by the thesis is one of the most useful end results: From this data it is possible to produce an almost infinite variety of chairs to satisfy the infinite variety of consumer tastes.

In summary, research has suggested that the optimum seat height for a breastfeeding chair for a woman of average height is 360mm.

Due to the incline of the seat and the need for under thigh support provided by the contours of the foam, the height of the seat towards the back, depending on the deflection of the foam will be lower than 360mm. Tests carried out using the test-rig (4.4.1) designed to test breastfeeding posture clearly showed that a user should not be able to deform the upholstered surfaces by more than 20mm, otherwise the height of the seat effectively will become too low ergonomically.

The shape of the backrest of a breastfeeding chair needs to be less contoured than most office chairs or car seats as the back needs to be nearly vertical to discourage the sitter to 'slump'. The angle of the back in relation to the seat therefore should be 95 degrees. The height of the backrest is less critical, but should not exceed 1100mm from the floor. The position of the lumbar should be set by the mother, the assisting midwife or health visitor at a supportive height, which will normally be within the range of 200mm and 300mm from the top of the seat.

Contact with the immediate environment needs to be aligned sensitively in order to optimise the ergonomic performance of the chair. For example the user needs to be able to reach the surface which holds a glass of water, or on which the telephone sits or the where the box storing breast pads is sited. The side table proposed is the same height as the seat of the chair, that is, 360mm, and should be easy for the mother to move out of her way.

Principal Aims:

The principal aims, as outlined at the beginning of this project have been:

- **To establish the need for a breastfeeding chair**
- **To conduct and complete the research, design and development of a chair to meet the needs of breastfeeding women.**
- **To test mock-ups and prototypes with groups of women in terms of aesthetics, comfort, facility to breastfeed and satisfaction with feeding from the chair.**

- To write and present supporting text of an historic, cultural and design nature intended to contextualise the chair.
- To present the research and the chair at the *CPHVA National Annual Conference 2002*.
- To find an interested manufacturer for the chair.

All these aims were met and are described in the text. In summary, the first production prototype was presented at the *CPHVA National Conference* in October 2002. An interested manufacturer for the chair was identified in *Tract*, a company who produce contract office seating in Thame, Oxfordshire. Since beginning to work with them in May 2002, several mock-ups and two final prototypes have been produced. The latter period brought the project into the realms of commercial reality, the implications of which have been described in Chapter 4. Sample chairs (production prototypes) are currently being placed in several baby clinics around the country, some of which are sites used as specific site visits for the purposes of research for the project. **Feedback from such centres will be collated and will form the basis of post-doctoral research, as might other observations made about furniture that is needed by women. The birthing chair adapted by a midwife at a Stockport hospital (Chapter 3) could inspire other gender specific design projects.**

The prototype proposed is functionally and aesthetically suited for use by clinics and hospitals and conforms to British Standards for contract furniture in that:

- It has contract quality fabric upholstery that is flame retardant (BS EN 1021, 1&2) cleanable and hardwearing. It is also DS Certified (Danish Systems – environmental management) as environmentally safe fabric.
- The way in which the tubular steel legs support the chair from the floor makes it very easy to clean underneath.
- The chrome finish on the metal components (the legs and the hanger on the backrest) is more acceptable from a hygienic point of view
- The chair is extremely stable.

However, there is a critical point that needs emphasising again. Namely that the chair produced as an end product of this thesis takes a particular form, but it is not the only form that such a chair need take. **The ergonomic data revealed by the thesis is a critically useful end result aiding**

the production of an almost infinite variety of chairs to satisfy the infinite variety of consumer tastes.

The research for the project has been extensive and exhilarating. Research included issues of historical and contextual interest. Definitions of breasts and breastfeeding, issues of gender, sexual stereotyping, psychology and physiology were observed to affect a woman's ability to breastfeed and explain why breastfeeding rates are so low in the UK. Without this fundamental research it is my belief that yet another irresponsibly designed product that did not quite meet the criteria may have entered the market place. **Being designed from a strong research base, hand in hand with the users and specialists and with the skills and expertise from both the disciplines of design and midwifery, this breastfeeding chair stands a far better chance of longevity.**

A midwife asked that, as women in other cultures do not need breastfeeding chairs why then do we? In most Western societies the position for breastfeeding is sitting upright on a chair. We have evolved with the chair as a fundamental accessory to our daily lives. We live in a chair-dominated culture. We are brought up with chairs. We go to school, to work, to the doctor's and to the cinema: it is hard to imagine these places without chairs. It is in this culture that the necessity for a chair in which to breastfeed arises. This is not the case for all cultures.

Without doubt, the most valuable research was that done in collaboration with midwives, health visitors, key figures within the field and breastfeeding women. The research brought me into contact with such inspirational figures as Sheila Kitzinger and Germaine Greer, who have committed lifetimes of research to women's issues. Neither of them could think of any research they had come across which mentions breastfeeding furniture. Also in terms of inspiration, Robin Day, always delighted to hear about the after-life of his chairs, kindly thanked me for informing him that some his chairs designed in the 1960's are now being adapted and used on a daily basis by breastfeeding women in the special care baby unit at *Gloucestershire Royal Hospital*.

The decision to conduct case study research proved to be the most informative of all the research methods. The observation that many women breastfeed with their feet on tiptoes, need a glass of wine or a bar of chocolate close at hand or desire emotional security whilst breastfeeding might have gone unnoticed had questionnaires been used more widely. Such research also indicated that chairs currently being used in hospitals and baby clinics in the UK are adapted versions of chairs designed for other uses. These chairs were the starting point for the design: there is clearly a desperate need for a chair that meets breastfeeding needs without needing to be adapted. I discovered mothers breastfeeding in toilet cubicles because they had nowhere else to go;

mothers in their homes balancing their babies on boxes and ironing boards, and mothers feeling humiliated and embarrassed in hospitals. I interviewed midwives who adapted their own furniture and who spent extraordinary amounts of time telling me of the problems they encounter with furniture every day.

These informal interview techniques proved to be the most suitable for this project. I gained far more of an insight into the feelings of the women as they breastfed by using conversational techniques: filling in a questionnaire is a difficult thing to do whilst breastfeeding. Using drawing and model making skills whilst employing conversational interview techniques was a useful asset to the research and one in which I felt that being a designer was a huge bonus.

Design is always a compromise. Decisions about taste and cost are always difficult to make. Research shows that users of sample chairs in clinics in low income areas would pay between £70 and £80 for such a chair for the home, whereas the midwives and other specialists who work in the field of breastfeeding put a figure of between £200 and £300 for institutional use. Interestingly, women from high income areas said they would pay between £200 and £300 for the chair for their homes. Taste has also influenced the range of upholstery fabrics and colours offered. It will be interesting to evaluate which are the most popular choices. One baby clinic has asked for fabric upholstery that is easier to wipe on the seat than the back, which is feasible due to the fact that the seat and back are made of two separate components.

It is evident throughout the thesis that this understanding of psychology, anatomy and physiology is more than useful for the designer of a breastfeeding chair. The psychological preparation of the environment in which a woman prepares to feed does evidently affect a woman's ability to produce milk. The historical observations made by Freud and Bowlby, for example, offer an understanding of emotional attachment, which could help mothers and designers to understand the need for skin to skin contact and the breastfeeding instinct. **Breastfeeding is a highly sensual activity.** Confidence can be improved by the response of the mother to the objects and the environment around her when she feeds. The feel of a fabric against her skin and the satisfaction of using her chair will affect her mood and her emotional and physical responses.

In its form, the chair is supportive and ergonomically correct for the activity for which it is designed. Moreover, the form of the seat in particular is shaped to give pleasure: stroking the curves and feeling the warm tactile qualities of the fabric is **comforting as well as comfortable.** Psychologically, as established in Chapter 2, it is important for women to feel confident and attractive whilst they breastfeed. **The sensual, skin to skin quality of chairs is rarely addressed by the discourse of design yet it is often the first and most immediate critical**

observation to be made. It is an added bonus that you do not need to be breastfeeding to enjoy this chair.

A further consideration is that of role models: positive breastfeeding role models are simply not evident in the UK. If women, men and children most importantly could observe more women breastfeeding in everyday life, on television, in art and in sculpture they would feel less alienated and more confident in their own ability to breastfeed. **The breastfeeding chair acknowledges breastfeeding.** It informs the user that it is 'OK' to breastfeed, and moreover that it is acceptable by those who have put it there, in their clinic, their home, their place of work, beside their hospital bed or in a café. What the chair communicates is a positive message to everyone not only those who use it, but those seeing it, manufacturing it, advertising it and those passing it on to their daughters and sons.

Future Research and Developments

As with most research projects, this research raises as many questions as it does answers.

Future research would need to address the impact of chair use on breastfeeding attitudes, behaviour and promotion. **Research questions include therefore:**

- **What is the effect of using the breastfeeding chair on women's attitudes, behaviour and satisfaction?**
- **What is the effect of the chair on professionals trying to promote breastfeeding?**
- **To what extent does the chair change public attitudes towards breastfeeding?**
- **How does the cost of the chair affect breastfeeding initiation rates?**
- **Is the chair cost effective in public health terms?**

In terms of the future development of the chair itself the following issues need to be addressed. The domains for the chair are domestic (the home) or contract (the clinic or hospital). As *Tract*, the manufacturer of the chair, make chairs for the contract seating market, it made sense to resolve the requirements of that market first. On reflection, some aspects of the chair may well be different for the domestic landscape. For example, although the fabric fits the criterion of 'warm and cosy' and would suit a domestic environment very well, the chromed steel components might be unacceptable for some: turned timber beech legs and a steam bent timber hanger might prove to be more acceptable aesthetically. Introducing metal into the home has always been contentious (as seen with the Ernest Race chairs described in Chapter 3). Offering alternative materials and finishes would be a possibility although the net cost of each chair would inevitably increase. Keeping the production costs to a minimum has been a priority. Manufacturing the component parts (legs and hanger) in steel is by far the cheapest option: turning timber legs

compared with cut lengths of tubular steel for example would affect the net cost of the chair by approximately £30 or more per chair. Having said this, no feedback to support the notion that metal is an unacceptable material for furniture in the home has been noted so far.

The weight of the chair has reduced since the days of the early prototypes. However, I would be interested in trying thinner gauge tubular steel for the legs and hanger and perhaps an even thinner plywood baseboard for the seat in an effort to reduce the weight of the chair further. Making the chair too light however would begin to affect its stability and strength, which would be something to be careful of. In summary, future developments could include:

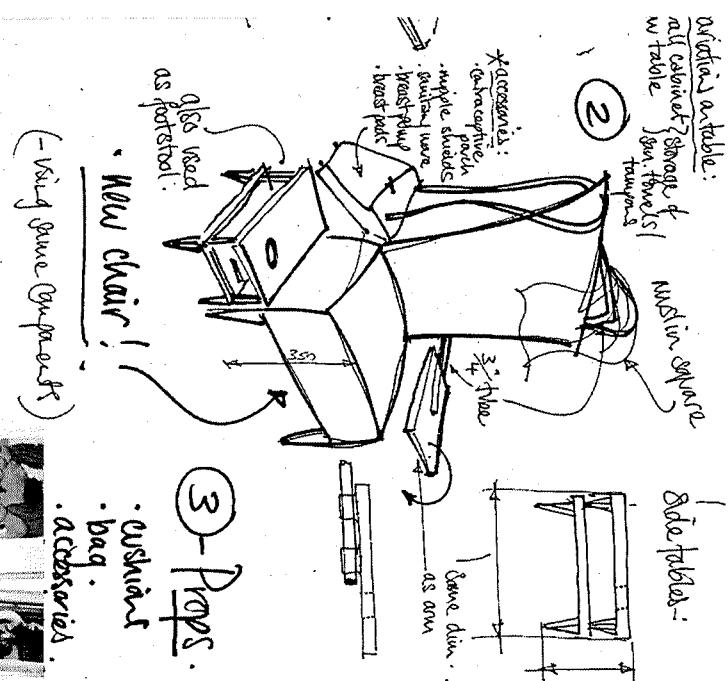
- Reviewing the chair for the domestic market – experiment with alternative materials to metal.
- Reviewing issues of weight.
- Updating upholstery options.
- Finalising the design for the side table.
- Investigating opportunities arising from the research for this thesis, for the research and design of other gender specific furniture.
- Getting international exposure of the research, for example at conferences. (A paper *Furniture For Breastfeeding Women* has been accepted for oral presentation at *The University of Hertfordshire Public Health Conference* in May 2003 and the chair and the research will be shown again at *The CPHVA National Conference* in October 2003)
- Collating feedback from users of sample chairs in clinics, hospitals and homes.
- **Establishing whether or not the breastfeeding chair affects the statistics for breastfeeding in the UK.**

I firmly believe that the chair resulting from this research will do the following:

Women will want *The Breastfeeding Chair* in their homes because they love it and believe it to work. Its use in clinics and hospitals will result in midwives and health visitors observing an improvement in the attitudes and feelings of women towards breastfeeding. It will uniquely provide, as only furniture can, the spiritual, emotional and ergonomic support for generations of breastfeeding women. Users of the chair will want to buy it for their relatives and friends, their children will start to see breastfeeding as an integral part of a young child's development. They might even pretend to breastfeed their dolls on it, later feeding their own children on it. For these reasons I believe that this chair has the potential to increase breastfeeding rates throughout the UK. Future research will help to establish the validity of these beliefs.



The Breastfeeding Chair 2003



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OK! Magazine, cover page, 19/6/2002

The Practising Midwife, April 2000

The Richmond Informer, 12/5/2000

Wallpaper Magazine, Oct. 1st, 2000

What's New For Hospitals, Summer Issue, 1999

Videos/TV & Radio

The Art of Successful Breastfeeding – *A Guide for Mothers*, New Vision Media, Canada
(undated)

The Art of Successful Breastfeeding – *A Guide for Health Professionals*, New Media Vision,
Canada (undated)

BBC Radio 4, *Twenty Minutes: Performing Art- A Modern Beechwood Chair*: Christopher Cook in conversation with Rebecca Milner from the V&A, August 9th 2002

BBC 1 Television Programme *People's Country: A Woman's Place* 26/1/1997

BBC 2 Television Programme *One Foot In The Festival of Britain* 6/11/1999

BBC 2 Television Programme *Like Mother Like Daughter* 26/4/2000

Internet

www.breastfeeding.com/all_about/_bf_rates.html All About Breastfeeding – Breastfeeding Rates

www.bl.uk The British Library

www.bucksccc.gov.uk/libraries Buckinghamshire, Local Library Network

www.cassina.it

www.-dawsonfab.co.uk

www.designmuseum.org

www.fira.co.uk Furniture Industry Research Association, Stevenage, Herts.

www.geffrye-museum.org.uk

www.guardian.co.uk

www.handbag.com

www.infactcanada.ca/index.htm

www.knightsbridge-furniture.co.uk NHS Approved Seating

www.library.wellcome.ac.uk The Wellcome Library

www.maternity.com Breast Care Products

www.nhm.ac.uk The Natural History Museum

www.prevention.com/poll/981124 Does Your Workplace Frown on Breastfeeding?

www.promom.org/true_breast.html Tru-Breast: Advertisement for Breasts

www.promom.org/bfpage.htm The Breastfeeding Advocacy Page

www.prairienet.org/community/health/laleche/detcontext.html The Cultural Context of Breastfeeding

www.radmid.demon.co.uk The Association of Radical Midwives

www.royalacademy.org.uk

www.tate.org.uk

www.vitra.com

www.vam.ac.uk V&A

www.thewomenslibrary.ac.uk

Interviews With The Author

Judy Atfield, author of *Women & Design*, 25/2/2002
Vreni Booth, *Feldenkreis* Teacher, Oxford, 30/1/2002
Sue Botes (CPHVA) London, several meetings between 1997 and 1999
Angela Davis, Textile Designer, *Dawson's Fabrics*, Huddersfield, 12/2/2001; 3/5/2001
Robin Day, Furniture Designer, 2/2/2001
Eames Demetrios, *Vitra* London, 15/2/2002
Norma Elliot, *Thame Health Centre*, several meetings between 12/2/1998 and 30/11/1998
Chloe Fisher, *The Infant Feeding Centre*, Oxford, 10/10/1997; 12/11/1998; 19/11/1998
13/6/2000
Anne Greer, *The Gloucestershire Royal Hospital*, 25/4/1999; 16/9/2000, 5/6/2002, 24/3/2002
Germaine Greer, 21/6/2000
Dora Henschel, *HVA*, London, 16/1/1997
Sally Inch, *The Infant Feeding Centre*, Oxford 24/4/1997; 10/10/1997; 12/11/1998;
19/11/1998; 13/6/2000
Andy Jackson, KIAD, The *Design Council* archive at Brighton, 1/4/2002
Sheila Kitzinger, Standlake, Oxfordshire, 28/11/2001
James Lilley, Prototype Maker, *Seymour Powell*, Design Consultancy, Chelsea, 24/5/2002
Jorge Pensi, Furniture Designer, *Ergonom*, London. 15/4/2002
Alison Ramsay, Director of Midwifery, *Stepping Hill Hospital*, 4/8/2000
Rosemary Thompson, *Department of Health*, Clinical Co-ordinator, 31/10/2002
Belinda Wells, Midwife, *Stepping Hill Hospital*, 6/8/2000
Colin Williams, *Janssen Cilag (pharaceuticals)*, Saunderton, 2/12/99; 3/2/2000
(For Case Study interviews refer to main text, Chapter 3)

Archives

The British Library, London
The Design Council Archive, The University of Brighton
The Geffrye Museum, London
MODA – Museum of Domestic Architecture, Middlesex University
The National Gallery, London
Ortho Cilag, Saunderton, Bucks.
The Parker Collection, The London Metropolitan University
The Royal Academy of Arts, London
Tate Britain, Millbank, London
V&A, London
Vitra London
The Wellcome Library, The Wellcome Trust, London

The Women's Library, London
Wycombe Chair Museum, High Wycombe, Bucks.

Organisations

The Association of Breastfeeding Mothers, Bridgwater
The Association of Radical Midwives, (ARM), Lancashire, email: arm@radmid.demon.co.uk
Baby Milk Action, Cambridge
The Breastfeeding Network, Paisley, Scotland
The Chiltern Midwifery Group, Oxford Radcliffe Trust
CPHVA (formerly HVA), London
IBFAN North America
INFACt Canada (Kathy Venter, midwife)
La Leche League, London
The National Childbirth Trust (NCT) Oldham Terrace, London
NMAA (Nursing Mothers' Association of Australia) Victoria, Australia
The Royal College of Midwives, Mansfield Street, London

Conferences

Culture, Health and The Arts World Symposium, The Manchester Metropolitan University,
(paper given by the author: *Furniture For Breastfeeding Women*), 13th – 16th April, 1999

CPHVA (Community Practitioners and Health Visitor's Association) Annual Conference,
Harrogate International Exhibition Centre, paper given jointly with Professor Sally Kendall:
Developing a New Chair for Breastfeeding, October 31st 2002

Design & Health – 3rd World Congress and Exhibition (paper accepted: *Developing a
Breastfeeding Chair*), Montreal 25th – 29th June 2003

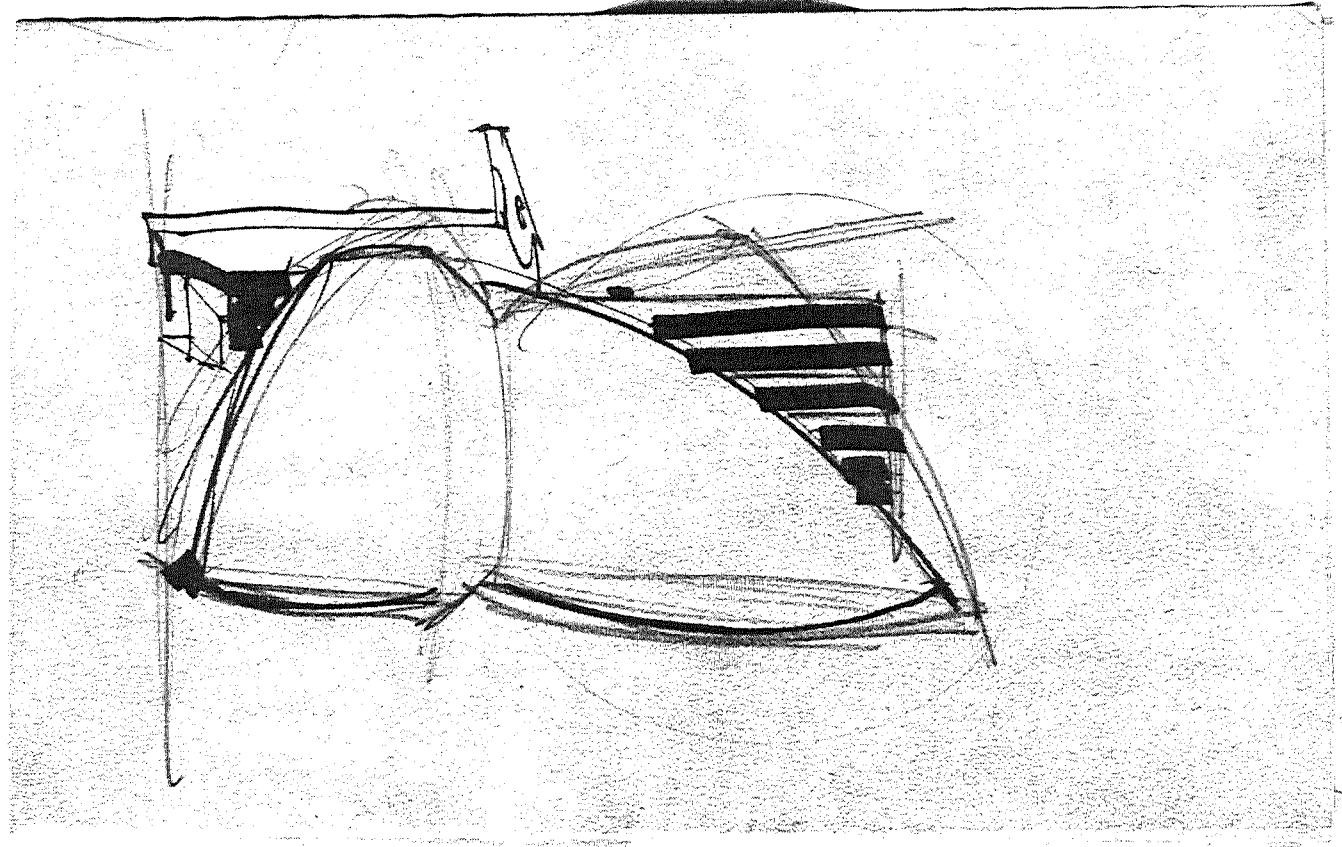
Primary Care Conference at *The University of Hertfordshire*, paper to be given jointly with
Professor Sally Kendall: *Developing a New Chair for Breastfeeding*, May 2003

Wexham Park Hospital, Berkshire, *Breastfeeding for The Millennium Conference. Furniture for
Breastfeeding Women*, paper given by the author, May 2000

Appendix A

Field Sketches

During interviews with breastfeeding women, health visitors, midwives and later with prototype makers, sketches were made which became pivotal to the design development process. The drawings in this appendix are a selection of those made between 1997 and 2002. They are in addition to those made during the development of ergonomic decisions for the chair. Particularly when interviewing breastfeeding women it was a huge bonus to apply this design skill: I was informed by my interviewees that this method of recording information being discussed at the interview was far less intimidating than being photographed or filmed. It proved to be the most discrete way of keeping notes and it also helped both interviewer and interviewee to relax. Many of the mothers requested copies of the sketches made of them at the end of the interview. Therefore these field sketches should be referred to as visual notes and a further means of communicating ideas (3.1; 4.2).

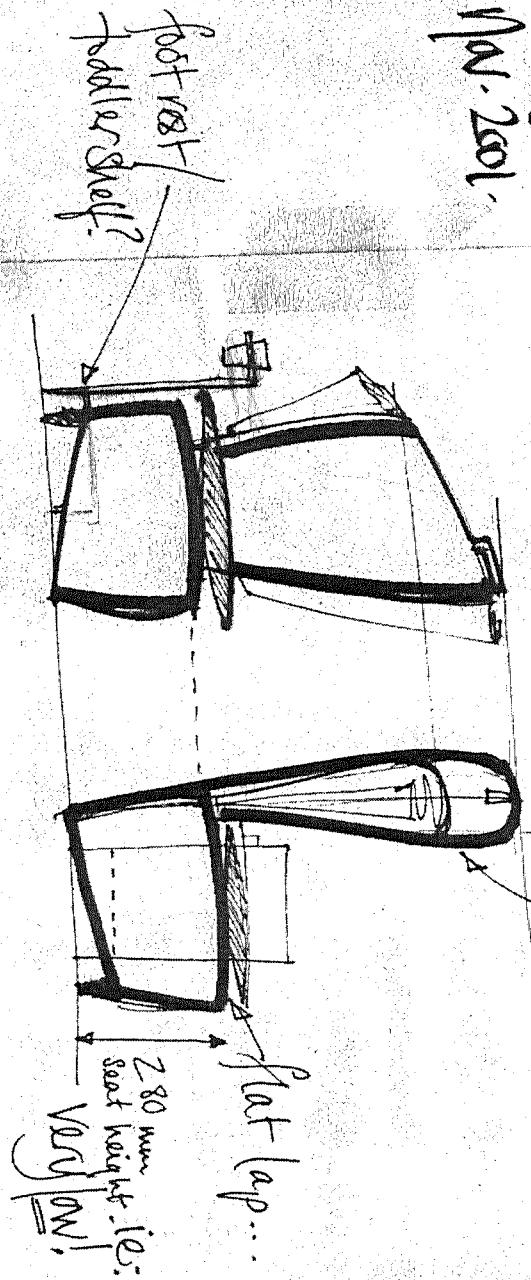


Breastfeeding chair: see full size drawing 8!

Prototype 2:

Nov. 2001

Straight back



foot rest /
pedal shelf?

flat lap...

280 mm

seat height i.e.
very low!

- loose covers for ease of washing.

- non-fixed curved surface (pedal seat).

- extended fabric wings

- "hugger" pillow!
e.g. sheepskin like texture?

beautiful pillow!

e.g. sheepskin-like fleece
fabric.

- texture

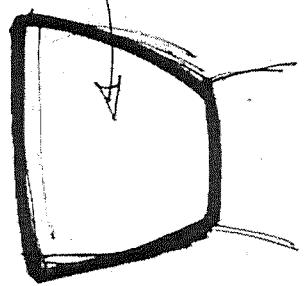
- warmth

- cleanability

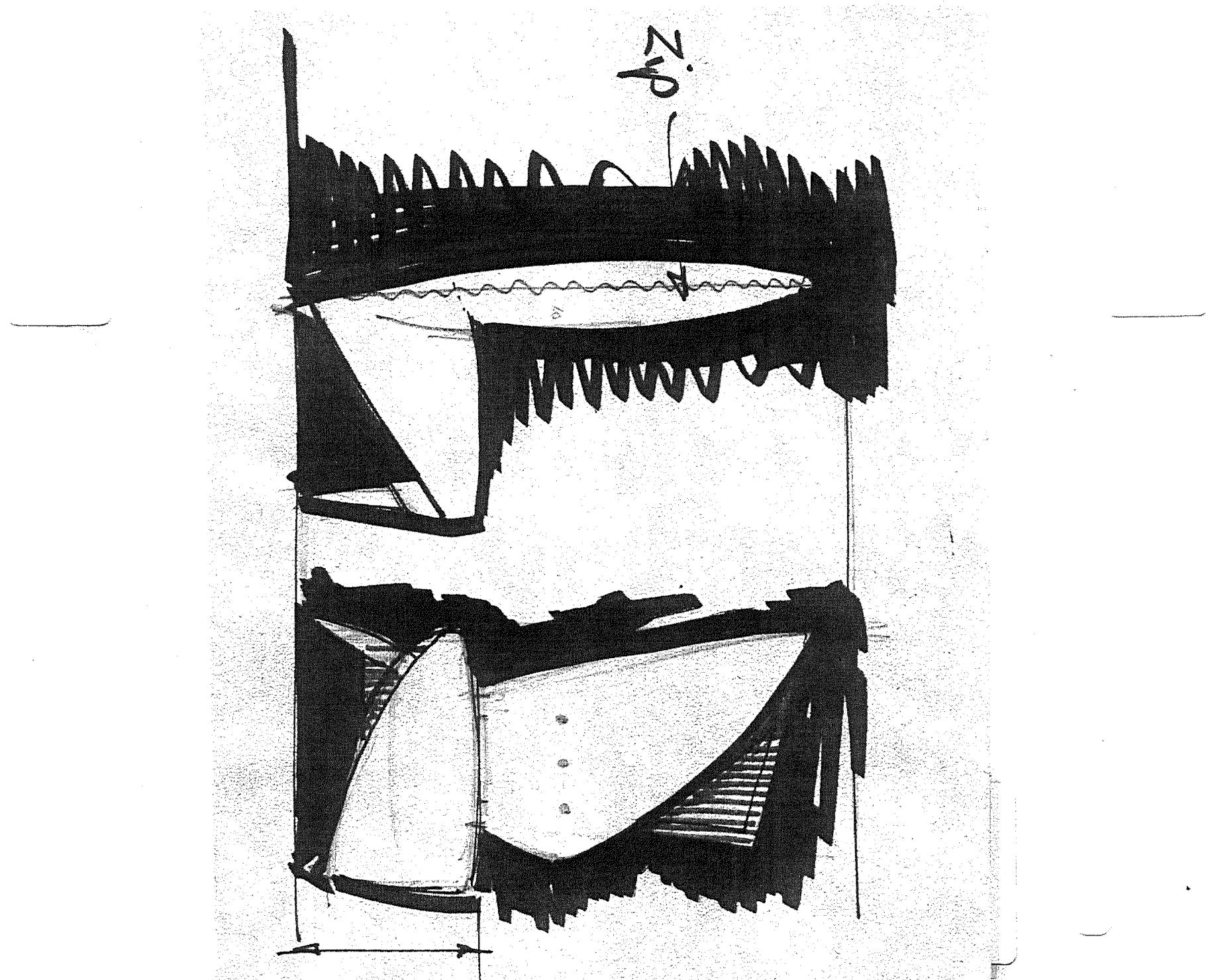
- ... yet suggestions...

turned legs
maple/beech?

plan:
shape



longer
legs?
maple...



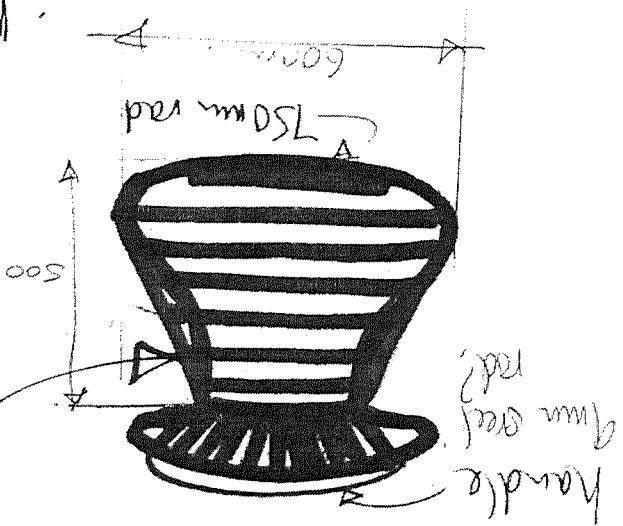
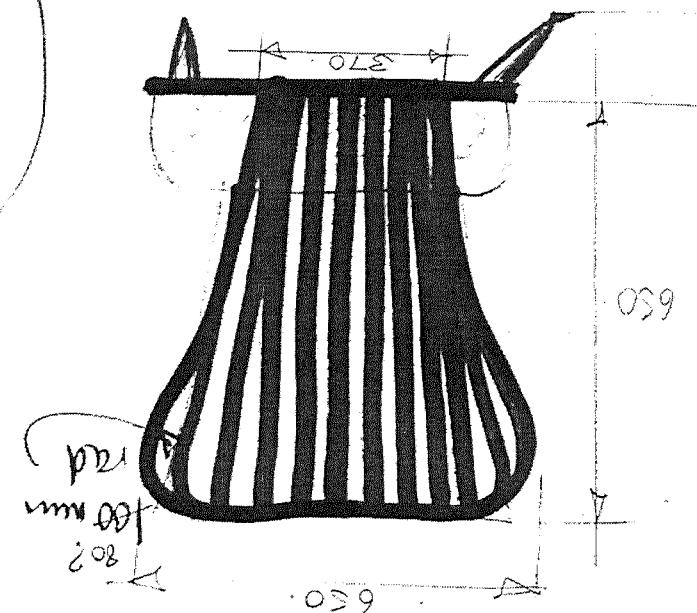
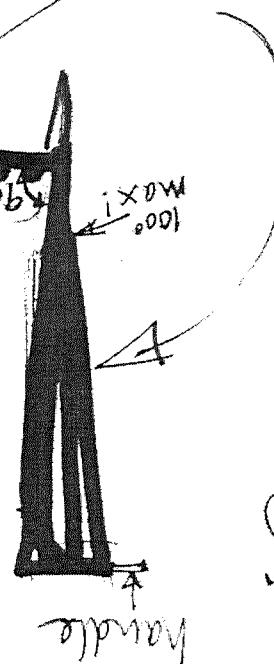
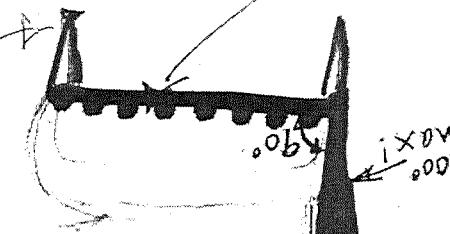
①. M. ~Dm.~
Wood perforator

May 11/2002.

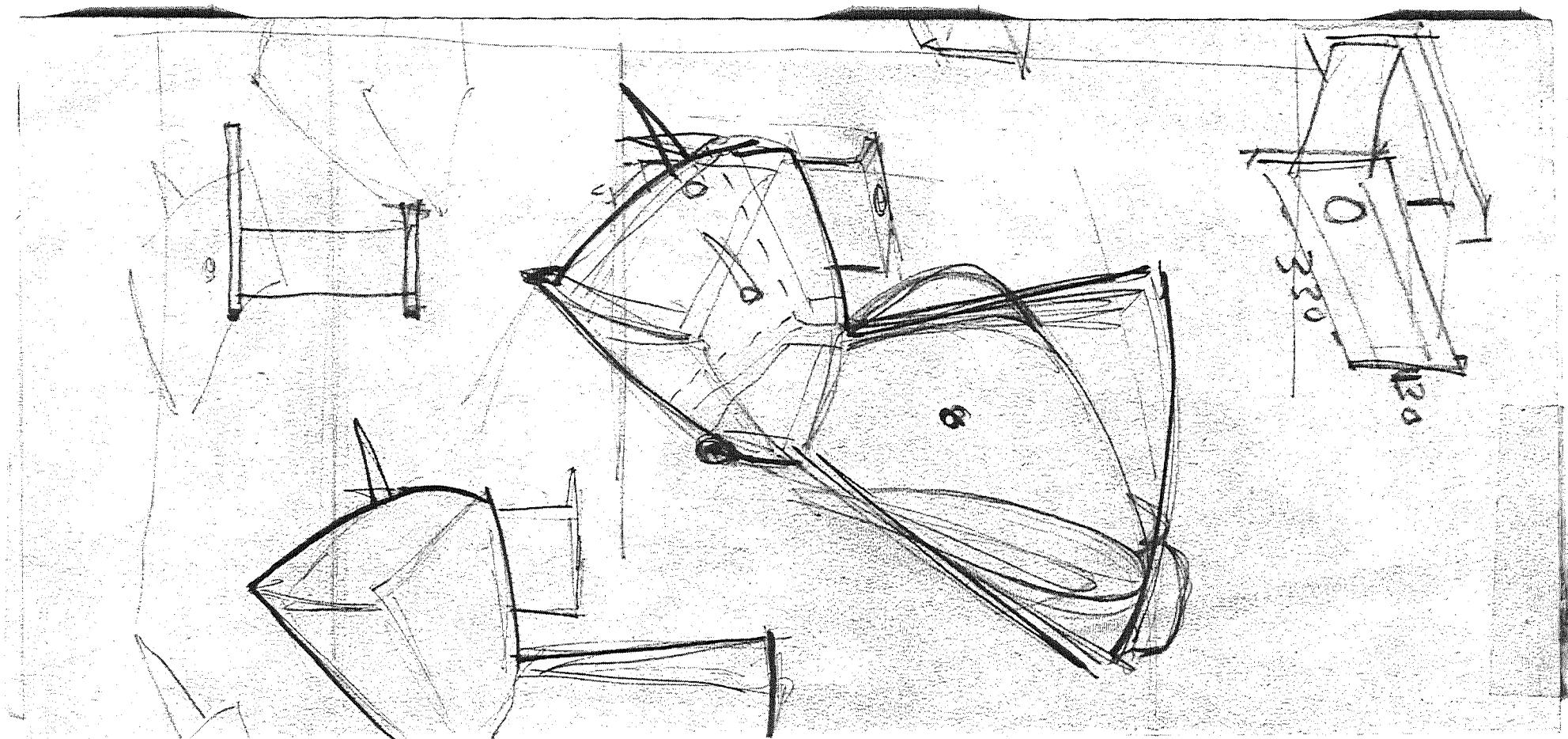
$\frac{1}{8}$ " thick steel =

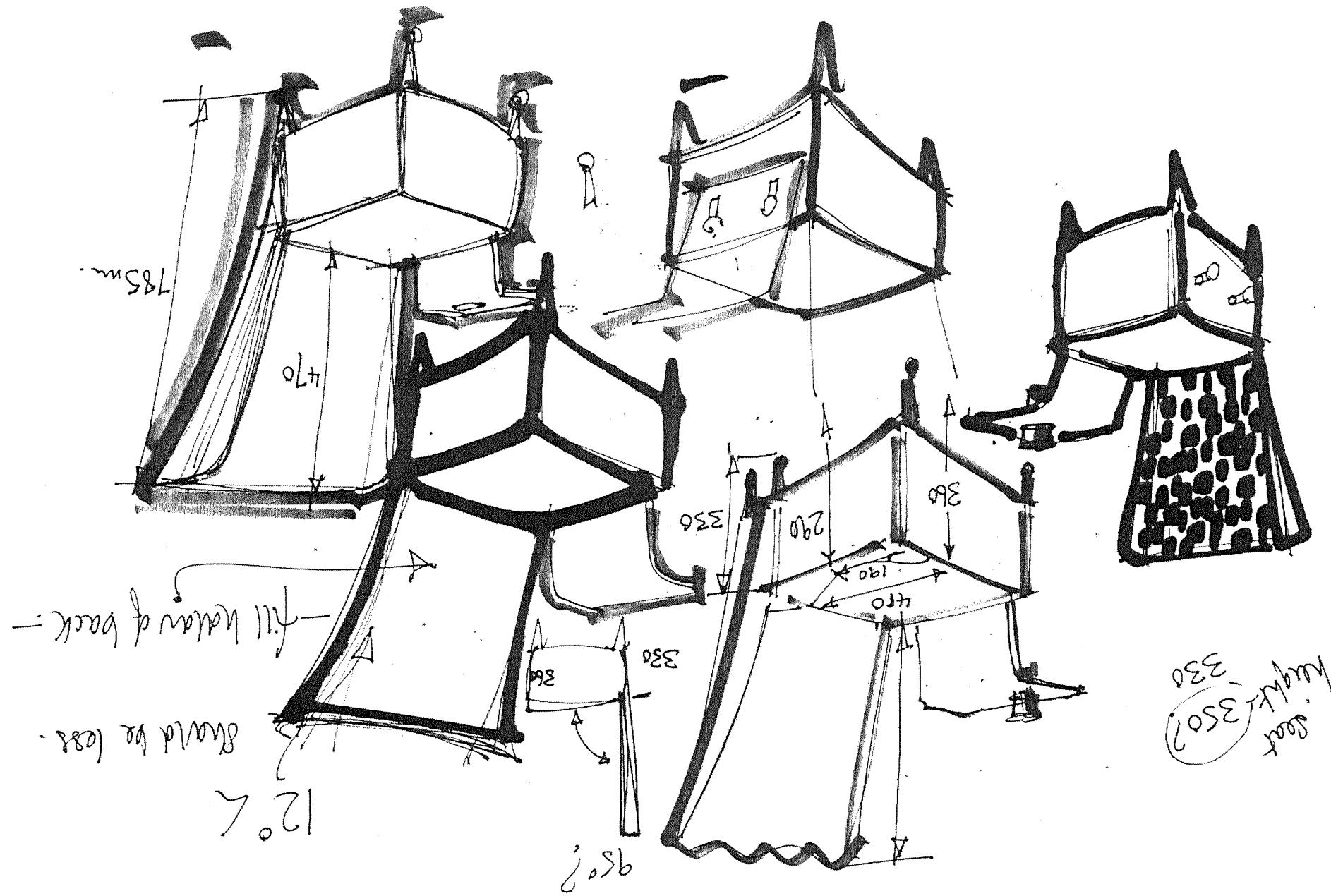
= Webbing

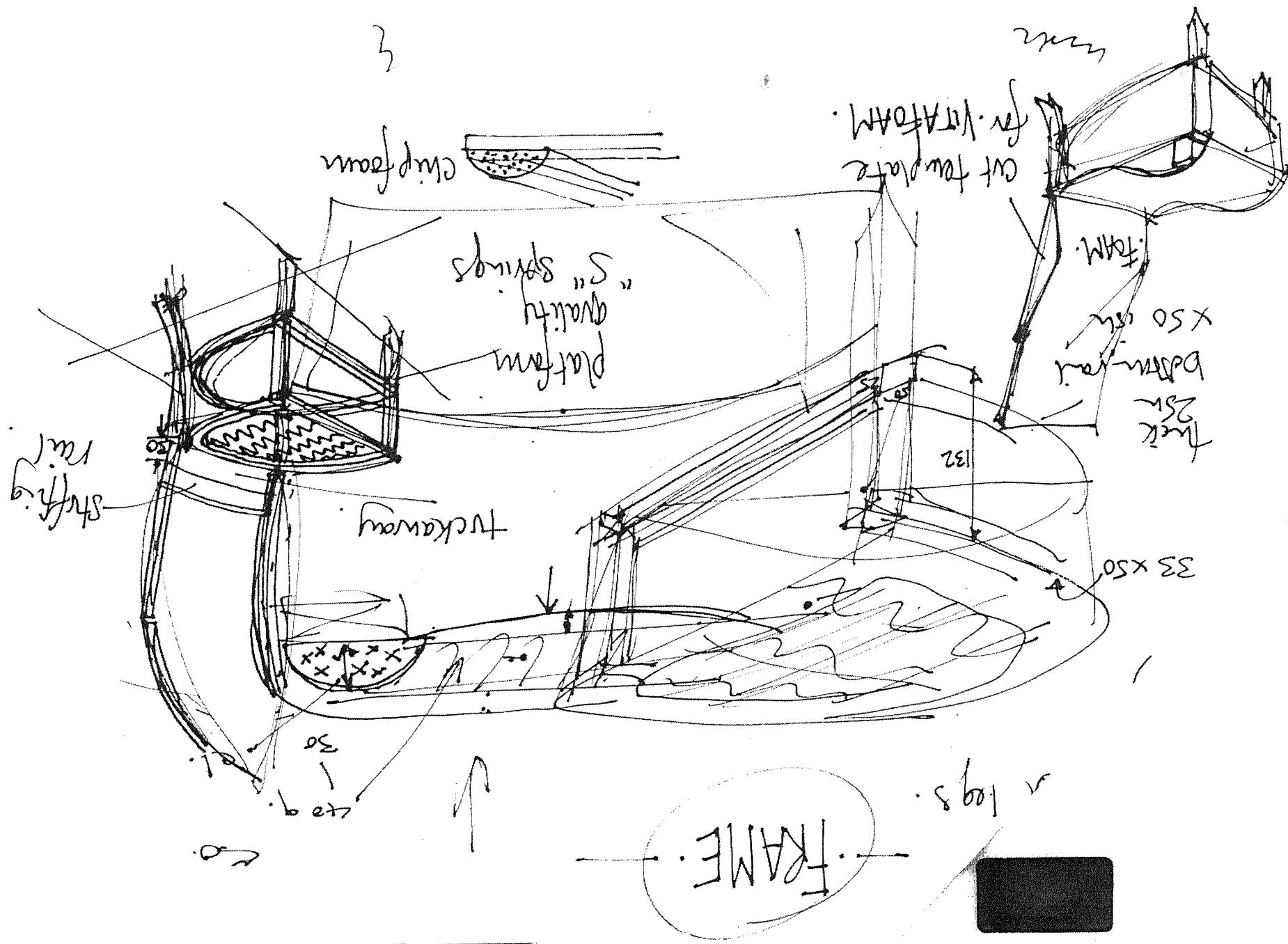
leaves from Polar (all)



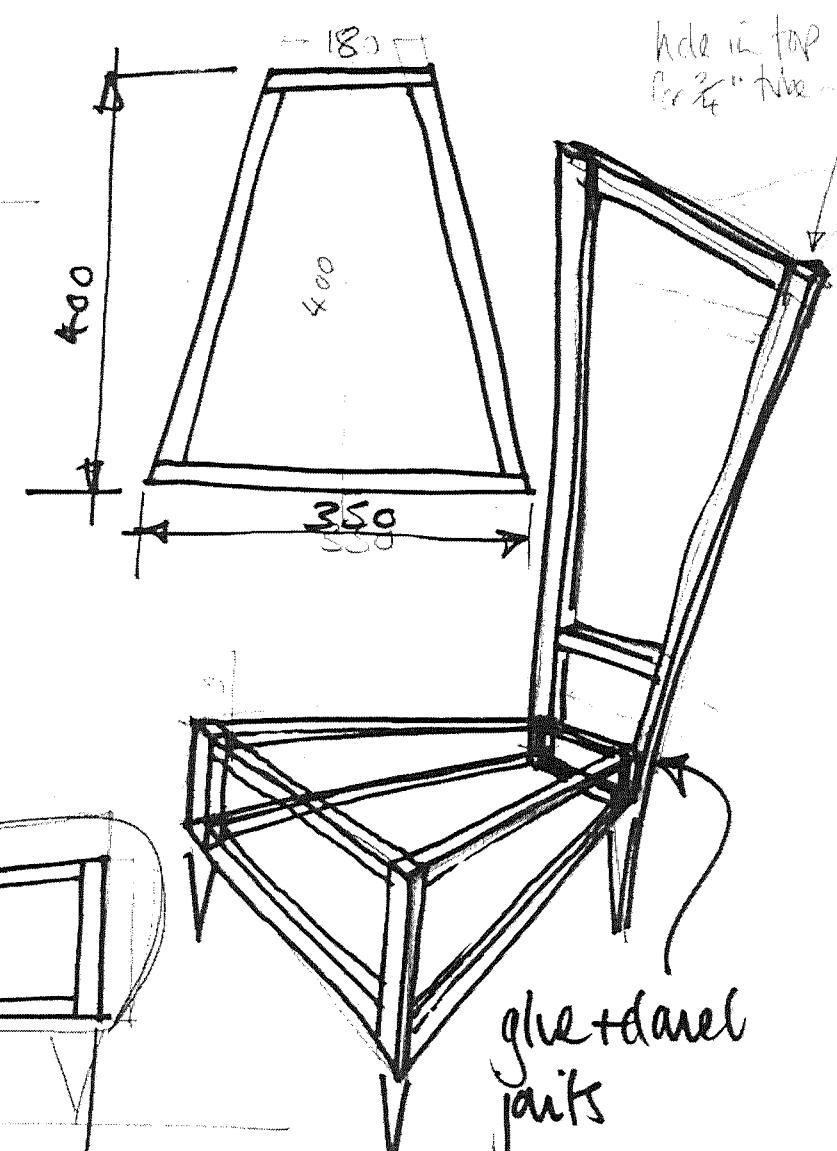
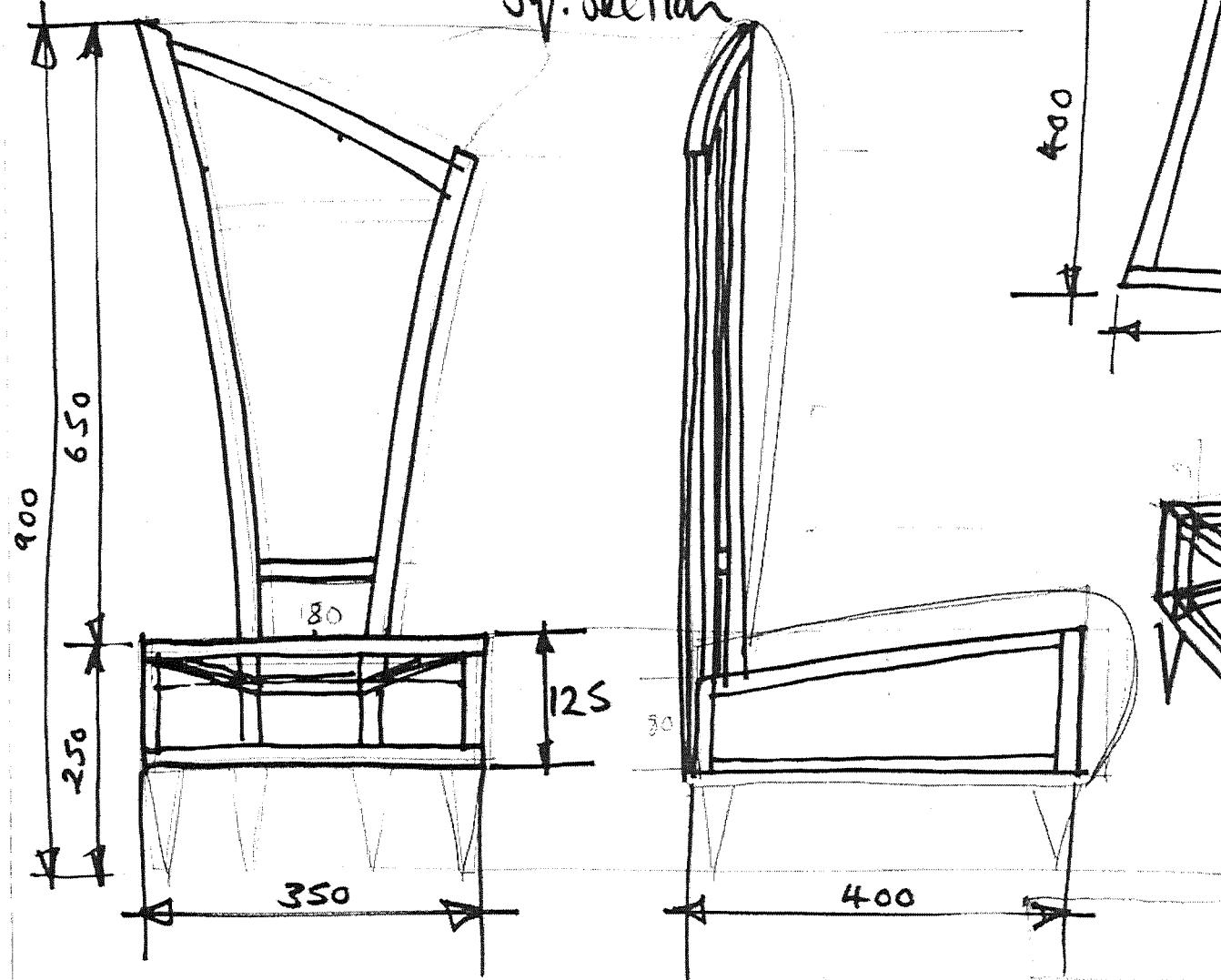
- all large curves: 750 mm rad
- all general radii: 100 mm rad
- 80°

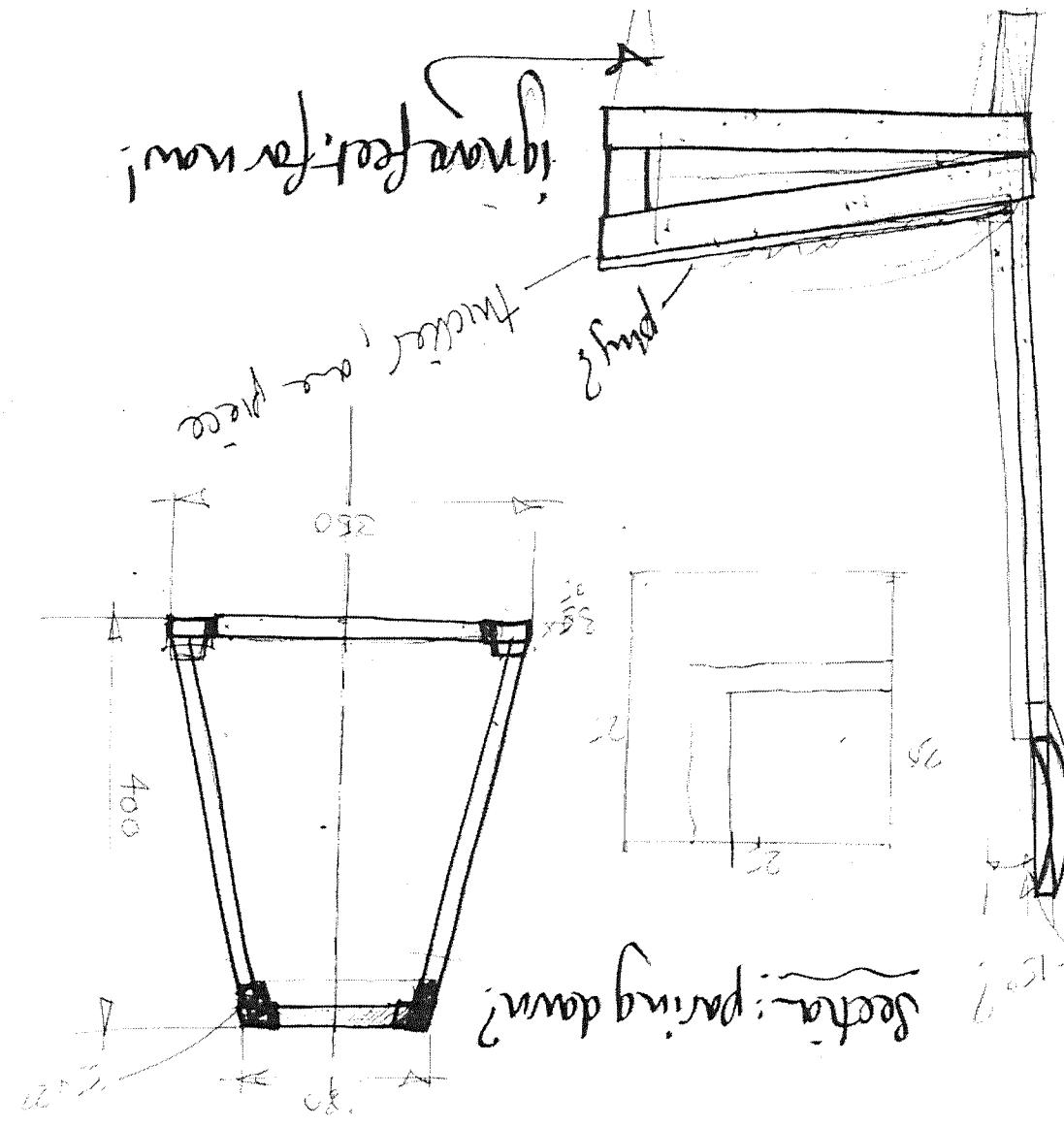




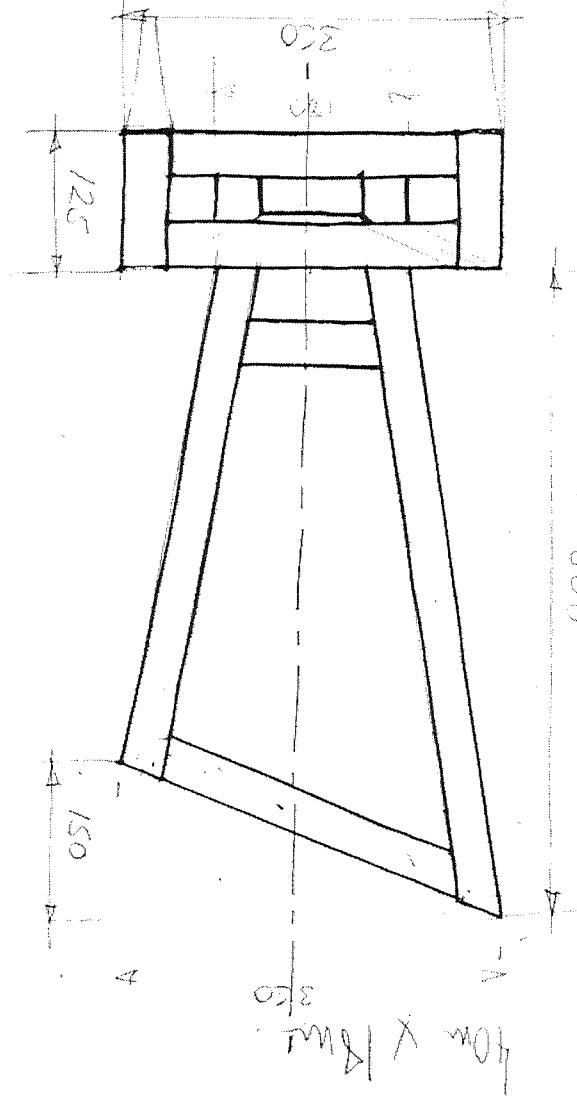


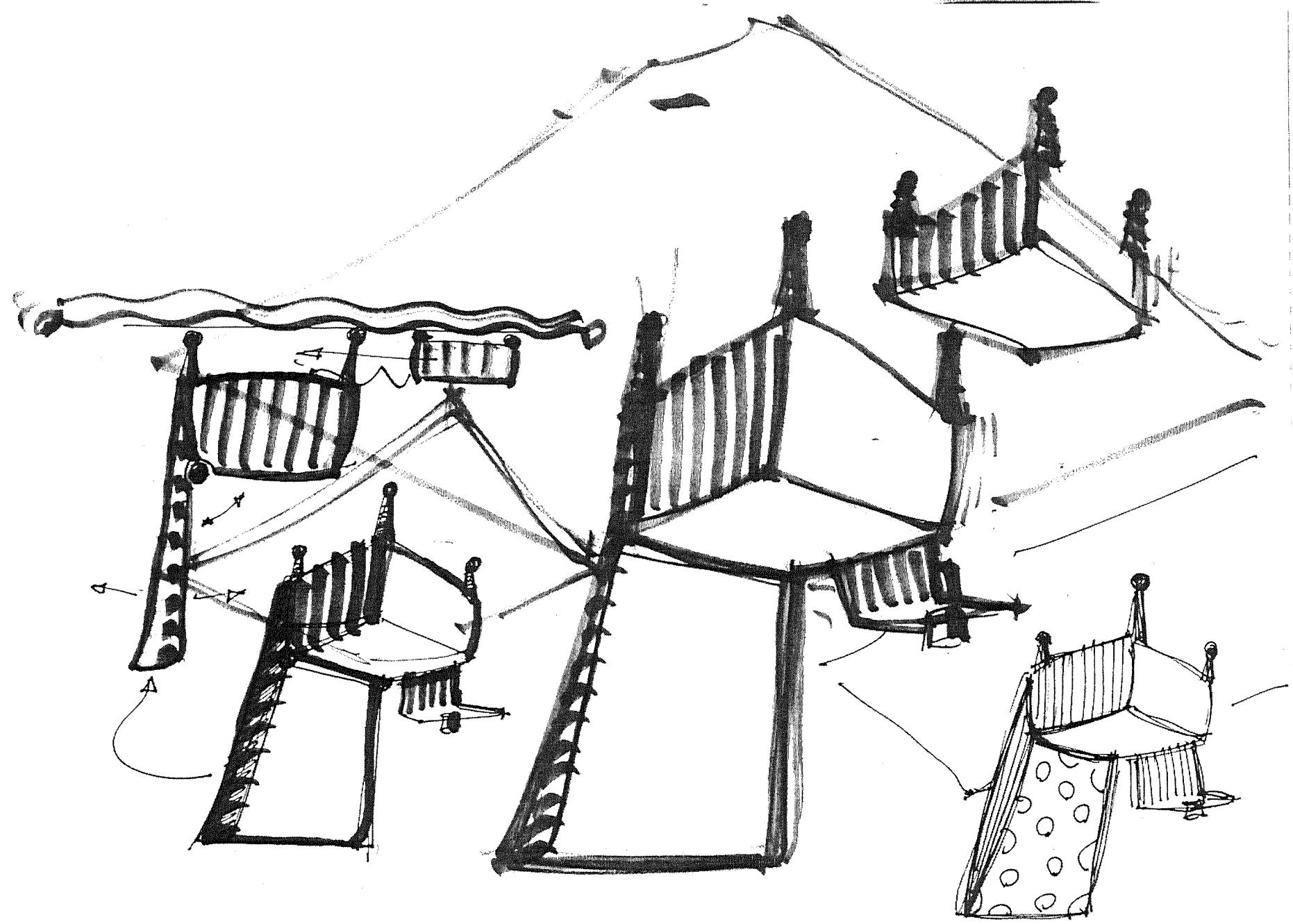
Prototype: frame 18×40
 Sq. section
 any softwood!

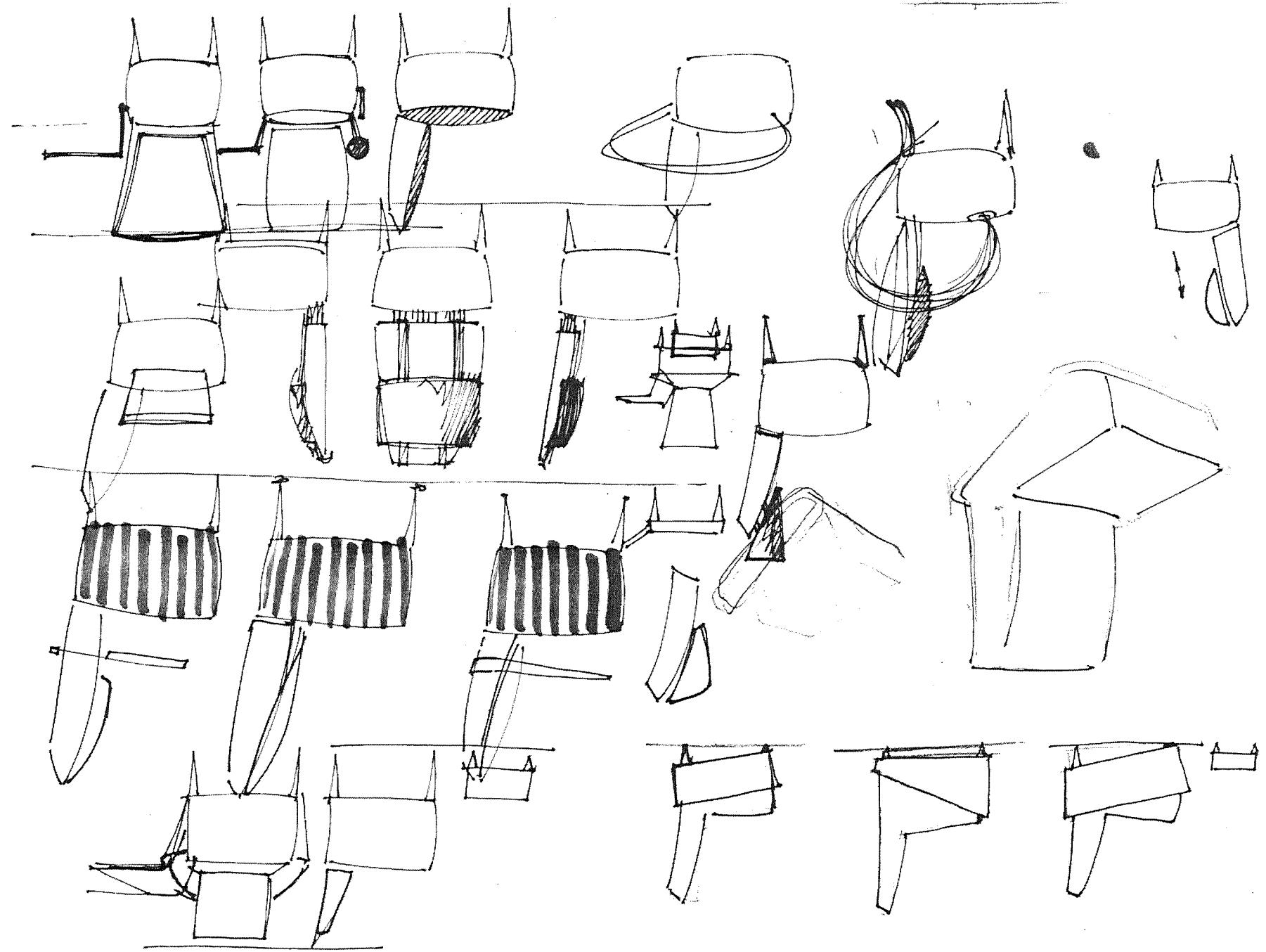




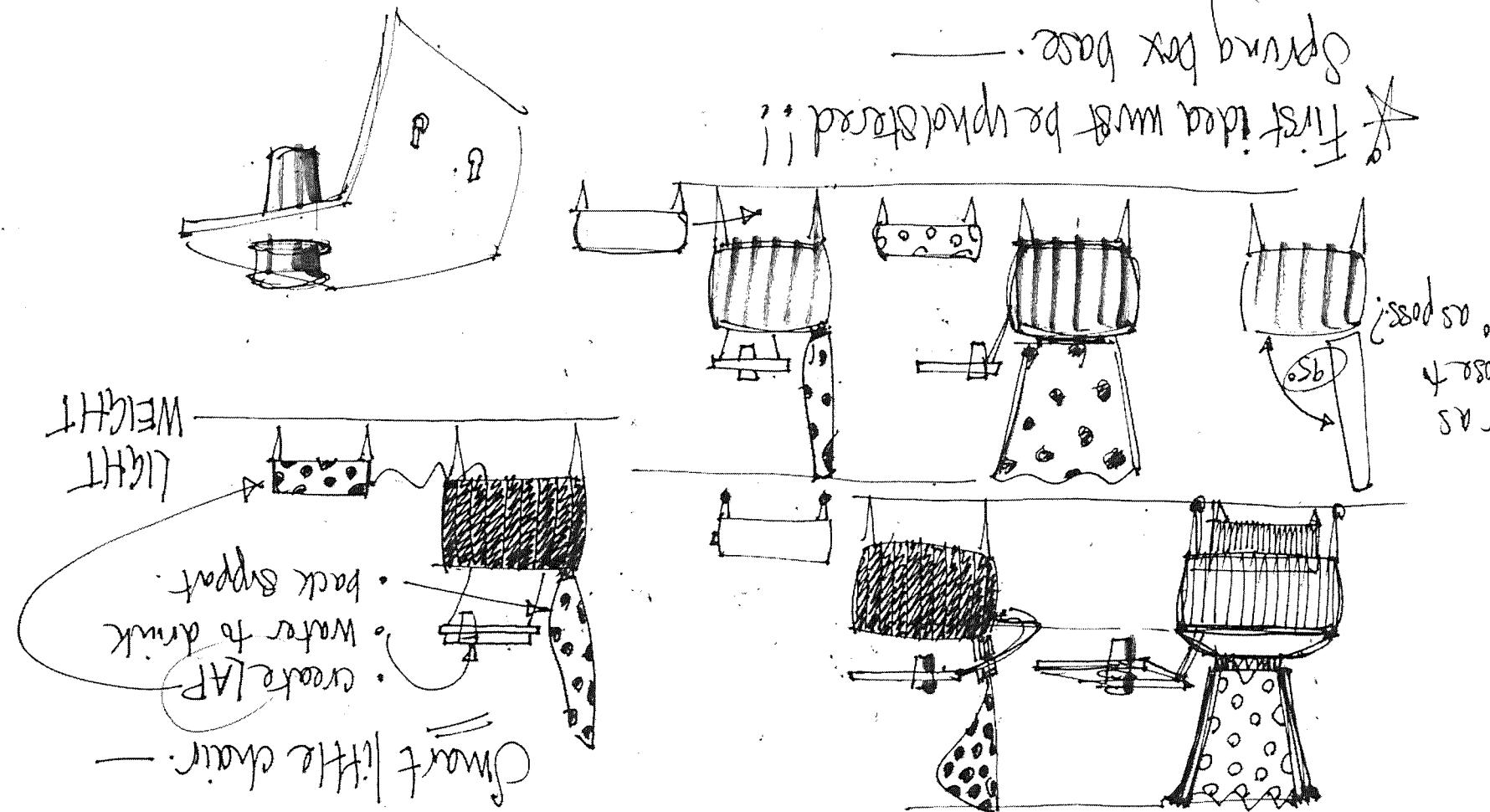
Scallop - bleak foot - 35 x 22,





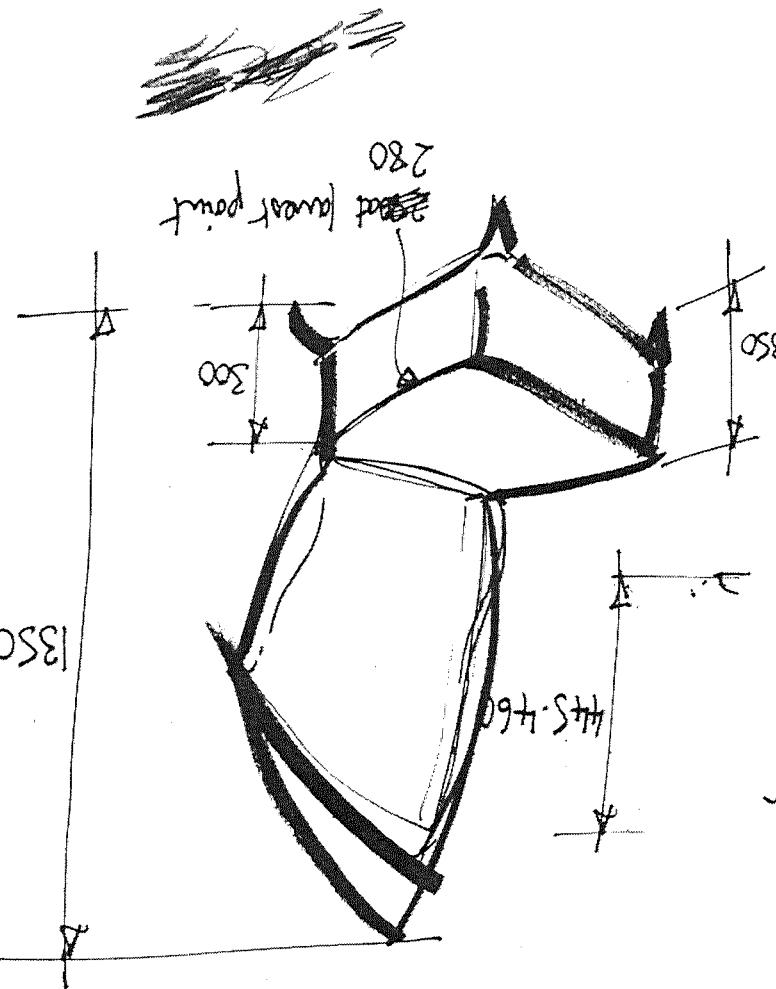


DEADLINE - APRIL 10th ! 1st Preliminary



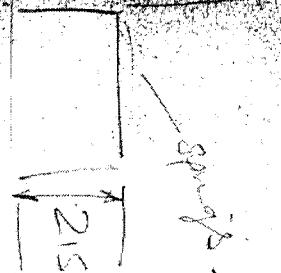
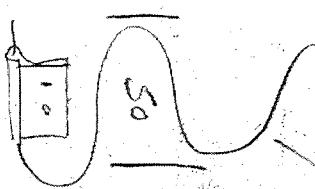
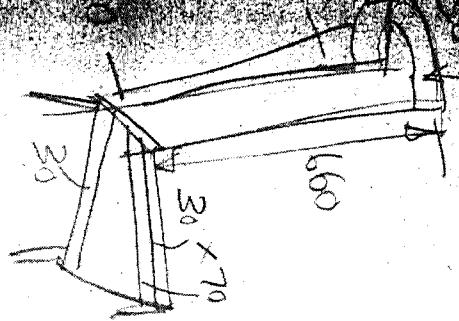
• Explains its
• purpose
• of drop
• for
• new
• changes

30SE

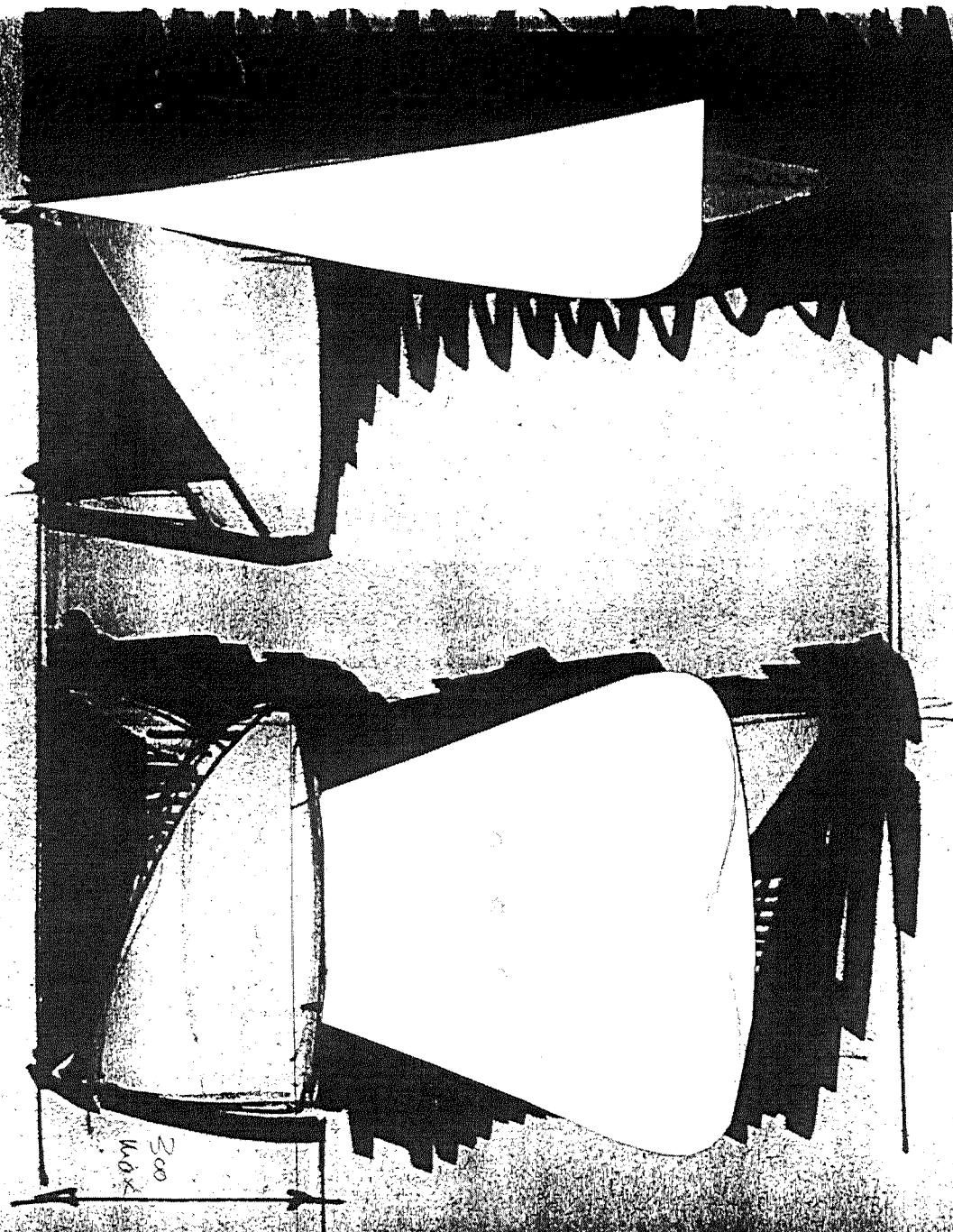


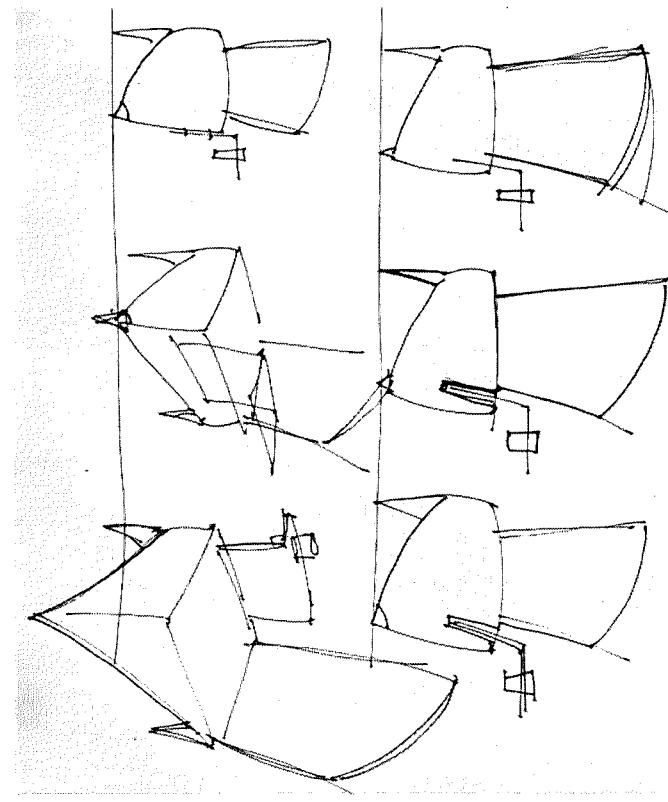
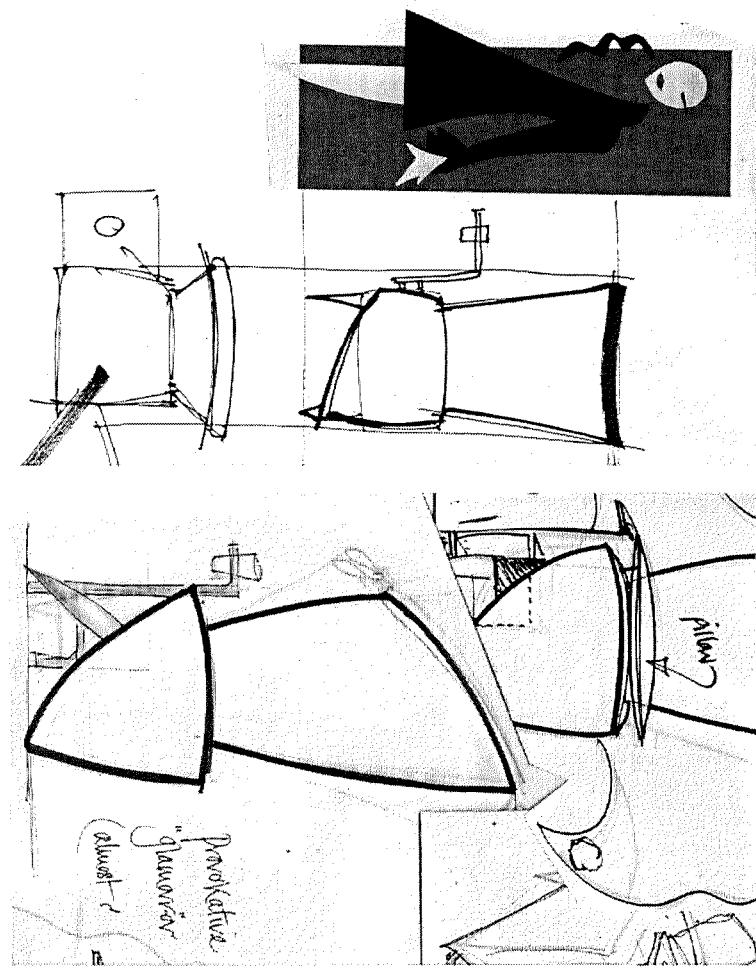
ring surface to draw

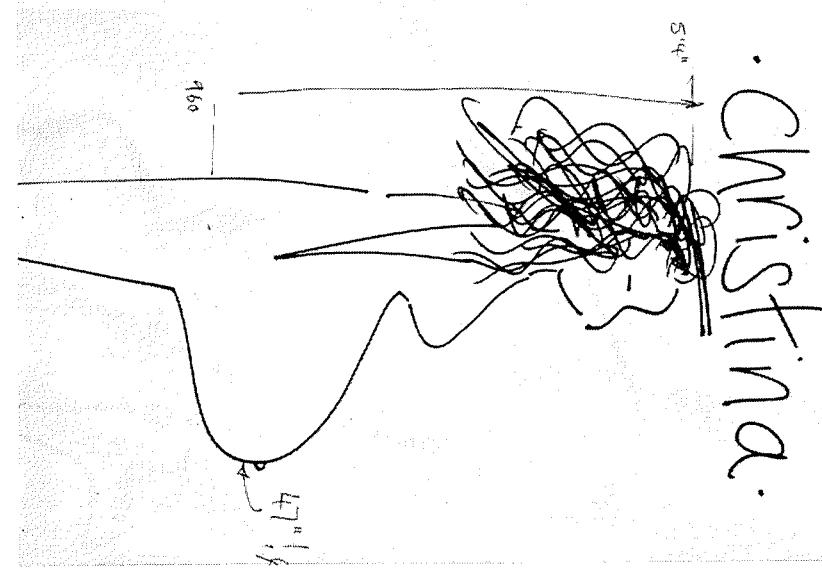
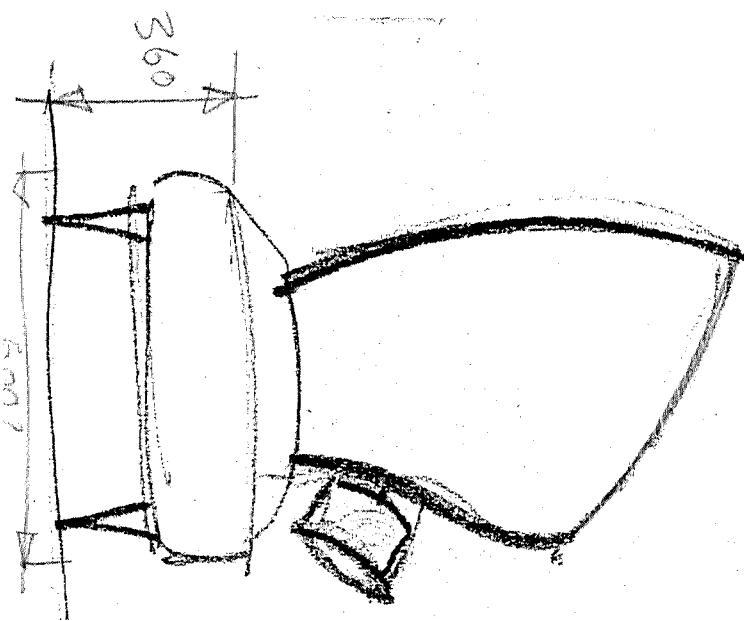
A hand-drawn diagram illustrating the airfoil sections and flow lines of a glider's wing planform. The diagram shows a top-down view of the wing with various airfoil sections labeled 'Wing' and 'glides'. Flow lines are depicted as curved arrows indicating air movement from the leading edge towards the trailing edge. A small circle with a dot is shown near the trailing edge.



500 "Curve
make 600 at front?







FRAME...

March 97.

Overall
height: 1100mm

back
height: 800mm

Section...

30 50
top rail
25 50
bottom rail

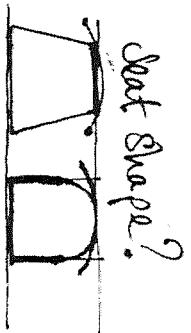
30

stuffing rail
tuckaway

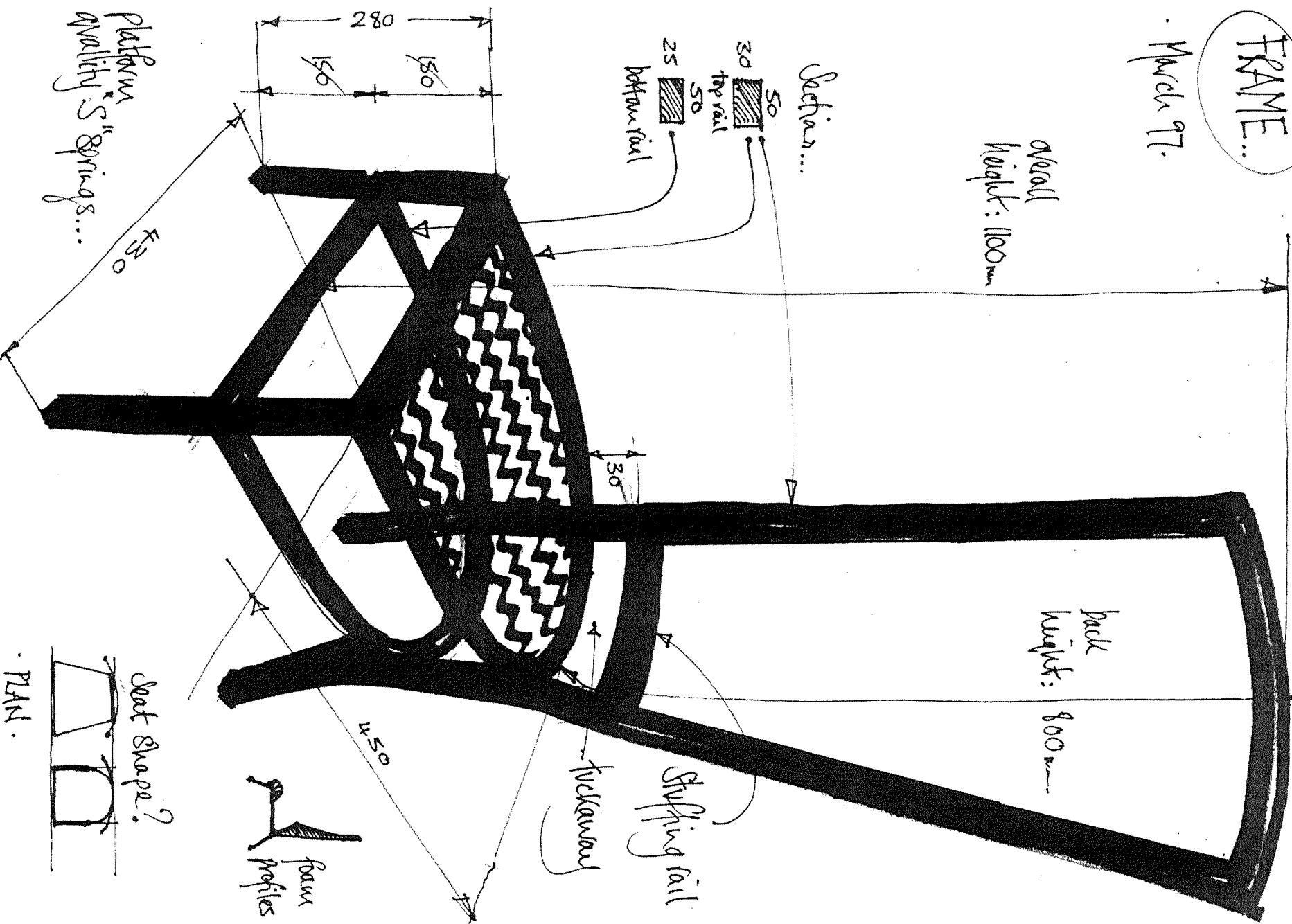
450

platform
quality "S" springs...

seat shape?

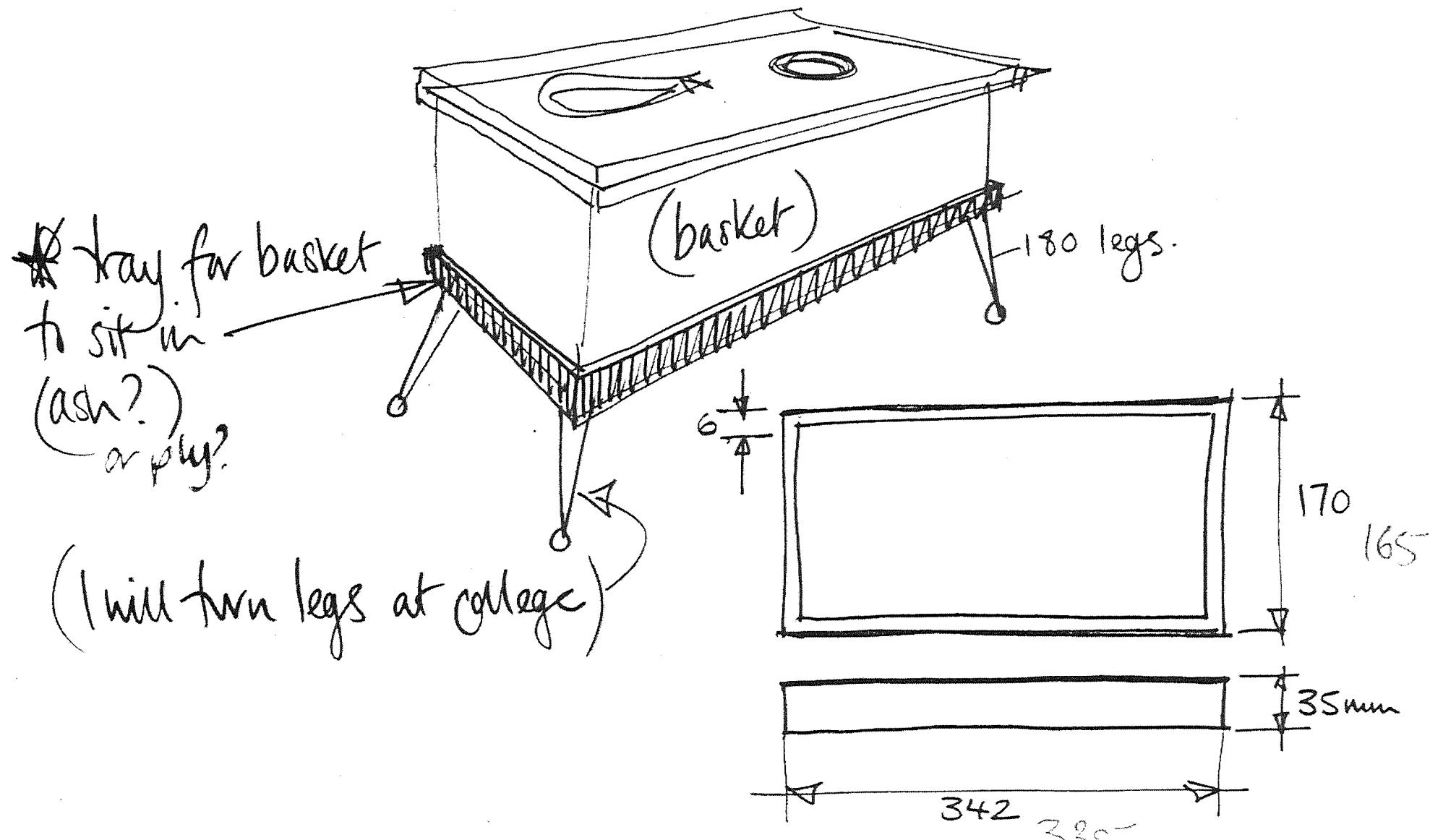


foam
profiles?



Side unit for b. feeding chair: Oct 2002.

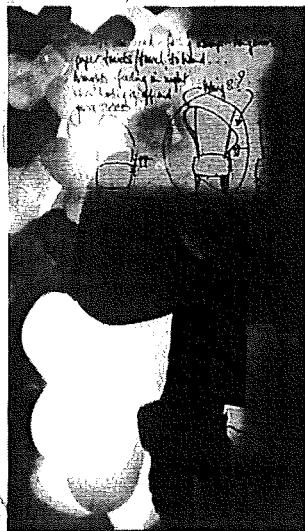
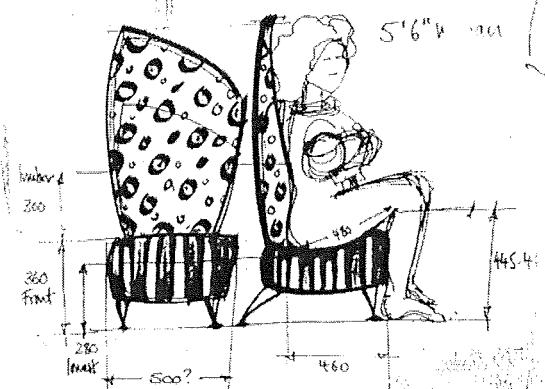
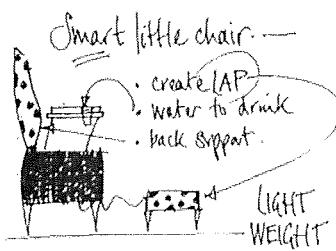
Hole in top: 70mm Ø



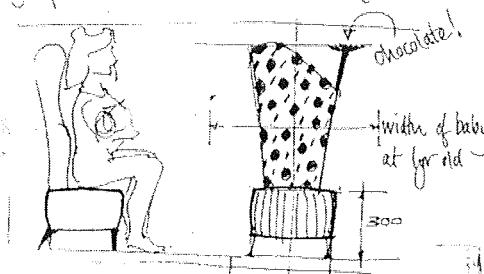
july 12th '02 : Review of height - seat - dimensions .

• deflection of foam brings seat height too low.

, increase leg height, and add box to underside of seat



Armrests only needed with small newborn baby until bathes.
Can fast + soothe: hungry-Tired-Cold



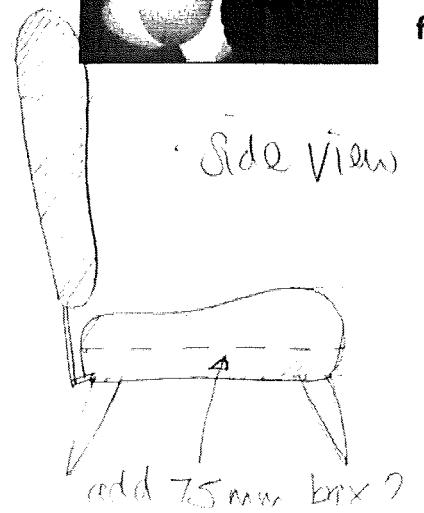
- sheep's fleece
- for feel raw, saw, cold, sharp, brittle, sandy, sticky
- for feel smooth and soft
- chair should be like a mother, snuggly
- opportunity for repose ...



Furniture for Breast Feeding Women

for further information contact Lynn Jones on 01494 522141

• Side View



• 360.

• 360 to allow for
distortion of
foam ...

Mobile: 07905 112347

Email : j.sally@virgin.net

Appendix B

Working Diary: February 11th 2002 – October 31st 2002 (Final stages of the writing of the text and the prototyping of the breastfeeding chair)

On Monday February 11th 2002, I began a concentrated period of prototyping and practical research. I have chosen to include the evidence of it in diary format to accurately reflect the complex division of time during that period and the methodology that evolved. The period is divided in to two stages:

Stage 1: February 11th – May 6th 2002

Stage 2: May 6th – August 14th 2002

Stage 1 represents preparation for the submission of the first draft to the two supervisors of the project. This ran parallel to prototyping conducted during daytime periods when workshops both at BCUC and at *Tract* were accessible (see Chapter 4).

Stage 2 is focussed on the development of the prototypes with a manufacturer. Key points in the design development process are written in bold text.

Prototyping Stage 1: February 11th 2002 – May 6th 2002 (Mondays in bold)

- | | |
|-----------------|--|
| Feb 11th | Beginning of three month sabbatical period (BCUC) |
| Feb 15th | Meeting with Joanna Moore, Marketing Manager at <i>Vitra</i> – some useful research was done to supplement contemporary chairs section of Chapter 3. This was particularly relevant with regard to Charles Eames' <i>L.C.W</i> chair, discussed in Chapter 3. In the afternoon I attended a seminar with Eames Demetrios, Charles Eames' grandson discussing the Eames' design philosophy. |
| Feb 17th | Discussion with Mary Anne Osborne from <i>Thame Health Centre</i> with regard to contacting the local Health Visitor for feedback from prototype, alongside Chloe Fisher at <i>The John Radcliffe Hospital</i> |
| Feb 18th | Meeting with Peter Anderson (upholsterer) with prototype drawings for Chair 1; I aim to work on drawings this week in addition to continuing with the text. I also aim to write up section 4.1.3: Ergonomics by the end of March. Call <i>The Wellcome Trust</i> and <i>The V&A</i> re. Chapter 1:'History of Nursing Chairs' Aim to write by end of April. |
| Feb 19th | Work on drawings before next upholstery session (Mon.25th Feb) |
| Feb 20th | Work on drawings...and text (evg) |
| Feb 21st | Work on drawings...and text (evg) |

| | |
|------------------------------|--|
| Feb 22nd | Aim to finish drawings for Mondays upholstery session |
| Feb 25th | Work in upholstery. Telephone interview: Judy Atfield, author of <i>Women & Design</i> |
| Feb 26th | (Tunisia MA study tour, until March 6 th . Take laptop to continue writing of text for thesis) |
| March 7th | Review progress in the light of study tour: additional research to integrate in to text. |
| March 11th | Bristol – breastfeeding case study visit (2 days). Collected missing photographs and conducted final interview. |
| March 14 th | Start full size drawings at the workshops of <i>And Furniture</i> in Thame Collect <i>Taino</i> chair from <i>Vitra</i> to look at with regard to using as an example of Twentieth Century chair, Chapter 3. |
| March 18th | Finished section on Fleece Fabric, Chapter 3. |
| March 21 st | Visit to MODA – Museum of Domestic Architecture, Middlesex. Found references to <i>HK Furniture</i> (UK) |
| March 25th | Finish writing up ergonomic section this week |
| March 27 th | Joined <i>British Library</i> ! |
| April 1st | Interview with Andy Jackson about the <i>Design Council</i> archive at Brighton, where I am searching for references to 1950's chairs (no breastfeeding chairs/nursing chairs!) |
| April 3 rd | Full size chair drawings to Peter Cornish for BCUC technicians to help me to make second timber frame (Chair 2) |
| April 8th | Started to make box for side table on Prototype 1. |
| April 10 th | Chair research at <i>Vitra</i> . |
| April 15th | Jorge Pensi interview at <i>Ergonom</i> in London. Begin to make frame of Prototype 1 at BCUC. I have been asked to talk to <i>RIBA</i> architects at <i>Vitra</i> about 'Materials for Manufacture' - prepare <i>Vitra</i> talk. |
| April 22nd | First <i>Vitra</i> presentation. |
| April 23 rd | Visit MODA – Museum of Domestic Architecture. |
| April 29th | Finish chapter on history of nursing chairs this week. Interview: Anne Greer, GRH |
| April 30 th | Draft to Reg Winfield (supervisor) for feedback on Thurs. 2 nd May...check timber frame status? Timber frame is taking too long to make and the research into 1950's seating is inspiring me to investigate making a prototype using tubular steel. |
| May 2 nd | Feedback (text) meeting with Reg Winfield. |

End of Stage 1

Stage 2

The Aims of Stage 2:

- 1st draft hand in: end of July 2002, include brief at start of Chapter 4.
- Two prototypes to be completed by mid. July, one timber framed; one metal tube framed
- To find an interested manufacturer
- Product Launch at CPHVA Conference October 2002

Prototyping Stage 2: May 6th – August 14th 2002

| | |
|----------------------|--|
| May 6 th | Contact FIRA re - testing, for section 3.3.6: The Advantages of Fleece. |
| May 3 rd | Posted text to Professor Sally Kendall (supervisor). Built cardboard full sized mock up at the workshops of <i>And Furniture</i> to take to discuss with <i>Tract</i> (manufacturer of tubular steel framed contract furniture, Thame, Oxon) I arrange a meeting with the Managing Director, Richard Hughes, for May 9 th 2002. |
| May 7 th | Integrated art & media research into Chapter 1. |
| May 9 th | Worked on Chapter 1, art & media, Henry Moore and Picasso examples/ posture |
| May 10 th | Meeting with Richard Hughes, MD, Tract, Thame Summary: Took all recent sketches and full sized cardboard model. He was extremely positive and suggested that: <ul style="list-style-type: none">• I do a drawing of tube steel frame only for Monday• I contact <i>Peter Cook</i>, Oxon for legs• Foam can be moulded onto tube frame, then skinned with memory foam• Upholstery can be zipped down centre back for easy cover removal• Handle on back can be made using rod, therefore enabling the hanging of cloths etc.• Webbing suspends foam on 1st prototype version• Costs discussed: £60 production costs, £120 supply cost to NHS• Tooling costs approx. £4000 for moulding foam seat and back.• Take drawings to Peter Freeman, prototype manager, <i>Tract</i>, Haddenham by Tuesday 14th may |
| May 11 th | Richard Hughes calls to let me know that he would like to put the chair into production! |
| May 11 th | Work on drawings for <i>Tract</i> over weekend. |
| May 13 th | Do scale drawing 1:5 of tubular steel frame for meeting at <i>Tract</i> tomorrow. |

- May 14th Meeting with Pete Freeman (metal fabrication) at *Tract* in Haddenham. We will make the first frame smaller, using $\frac{3}{4}$ inch steel tube rather than $\frac{7}{8}$ inch, which will make it lighter and still maintain strength. We can use an 80mm former for the small radii, not 100mm as I had drawn. I was happier with this on seeing the former. My specification of 100mm radii had concerned me as I thought it looked a bit 'fat'! Seeing the shape in three dimensions changed my mind....
I am to call him on Friday to see progress. Also I must call Richard, MD, to keep him informed of my progress.
- May 14th PM: work on text, amending as Reg suggested. Compile secondary source list.
Arrange interview with 'Christine' with regard to case study notes. (Sally Kendall off sick – her feedback delayed by two weeks...)
- May 15th Check progress of timber framed prototype
Vitra seminars (Materials For Manufacture) approved by *RIBA*.
- May 16th Did a perspective sketch of chair to give to RH at *Tract*. PF on holiday for 2 days (metal fabrication) so frame will start on Monday 20th. Trying to get hold of Sarah Forester at *CPHVA* with regard to me writing an article for *The CPHVA Journal* about the breastfeeding chair research. Called *Peter Cook* about the chair legs. They will make four to the specified dimensions by the end of next week. V&A called back – will fax five references about from their archives. THIS WAS ALL THAT THEY COULD FIND.
- May 17th Took new perspective sketch to *Tract*: meeting with RH. Discussed forming both seat and back using *Memory Foam*. Tooling costs would be approx. £4000. They also offered to make a timber-framed version, or to upholster the one being made at *BCUC*.
- May 18th About *Tract*: 85 employees; £125,000 per month: factory running costs (3 sites: Thame, Haddenham & Wycombe)
- May 20th Re-arranged introduction as suggested by Reg. Started Design Chapter 3.
- May 22nd Collected slides of recent prototyping and prepared work in progress talk (London June 10th)
- May 23rd Rang *CPHVA* about journal article. They would like me to write 800 words per page, must be specific to community practitioners – health visitors; school nurses and district nurses either by 10th June for the July edition, or by 12th July for the August edition. Re-did contents page.
- May 24th Prototype Planning: RH rang from *Tract* and we talked about the chair legs which I received from *Peter Cook* this AM. I took them over to him and we provisionally decide to go for the chromed leg – 105mm high. Take it over to the prototyping workshop at Haddenham for a discussion about heights and the implications of the choice of leg. We decide to order four legs the same and see what they look

like on the frame. RH will do this. PF making steel frame still. RH calls after going to see the upholsterer at *Upholstery Trading* who requests a full size *Styrofoam* model from me. I call *Roger Webb Design* (0208 995 2445) to ask if they can advise me how to do it. I interview *Seymour Powell* in Chelsea (0207 381 6433/w.shop: 0207 386 0519) who put me onto James Lilley: The specification of type of modeling foam depends on what it will be used for. If the mould is to be directly formed over the rigid foam, it needs to be more solvent resistant. If the full size model will be used to digitally reproduce the shape for the mould it is less critical to select resistant foams. He suggests I use *Styrofoam IB* which is what they use the most. Their supplier is *Sheffield Insulation*, Park Royal, (0208 839 4301 fax) and a sheet 600 x 2500 x 150m will cost approximately £45. He suggested laminating it with either a p.v.a. based double sided tape, or p.v.a. glue. I then call a technician at college who said he has it in stock and I arrange to go in on Monday to start to make it: *Tract* now need the shapes urgently, in order to keep to my schedule.

Fabric samples arrived from *Peter Cook* this morning. One or two possibles but mostly unsuitable.

- May 28th Meeting with RH at *Tract* about what they need from me prior to moulding the form of the seat and back. Took sample of *Memory Foam* chair back in to college. Laminated pieces together to make blocks of the appropriate sizes (650 x 600mm / 650 x 650mm) As glue needs to cure, I arrange to go back to start modeling it next Wednesday. RH confirmed that *Tract's* upholstery division in High Wycombe will help make prototype, on the presentation of a *Styrofoam* model.
- June 5th Spent all day in 3D workshop at college making full size *Styrofoam* model to take to meeting at *Tract* tomorrow.
- June 6th RH at *Tract* cancelled meeting, and re-scheduled it for Fri 14th, which gives me a bit more time to fix the segments together. Prepared slide talk about PhD for *The Mill House*, London (for Monday 10th)
- June 10th** MA hand over back to me from Richard Levene. (Last week of term, BCUC) Did talk about breastfeeding chair at *The Mill House* to MA. Was asked to do a similar talk to staff at *Bromley By Bow Centre* ...they'll call me to confirm date.
- June 12th Re-organised slides from Monday's talk. Worked on bibliography to copy to students. RH (*Tract*) rang with bad news! Their factory in Thame has been condemned and closed down due to hazardous building materials found in walls, so he is busy trying to find a new factory, which may have to be in Bicester, though he said he'll still have a meeting with me there on Friday with my model!

- PM - fix segments of *Styrofoam* model together at *And Furniture* workshop
- June 14th** Meeting with RH & PF at *Tract*, 9.30am with full size model. In the morning I decided to shape the left-hand side of the *Styrofoam* model before taking it to *Tract* in the afternoon. Made back of model adjustable using dowels and fitted *Peter Cook* feet. Luckily *Peter Cook* rep was at *Tract* for the meeting and can make/send taller feet i.e. 140mm instead of 100mm as they are on the full size model. RH was really enthusiastic. We discussed making back contours more rounded and using a board similar to that on the model for underneath the foam seat, which makes the fixing of the legs more sturdy, making the chair more robust. We had a discussion about the handle on the back of the chair, which will be a problem, if we have the back height adjustable. I agreed to draw some alternative handle suggestions before our next meeting. RH kept the model to take to the upholsterer in Wycombe.
- June 17th** Worked on text – PM. Sally Kendall emailed to confirm our paper at *CPHVA Annual Conference* in October, to launch the chair. (Harrogate, Oct 31st) *VITRA* seminar dates confirmed: July 17th; Sept 26th; Oct 10th; Nov 14th; Dec 5th 2002.
- June 24th** Interview Carly (first breastfeeding case study) now weaning Fred at 9 months old to prepare for her return to work. Took missing measurements i.e. her popliteal length: 400mm/popliteal height: 375mm. Final interview – discussed employer's impressions of breastfeeding women and her feelings about not being seen to be distracted by Fred by prospective employers. She also told of her health visitor's surprise that she had a home birth with Fred and breastfed - the statistics for breastfeeding in Northumberland are low. She reminded me once again that the chair should be 'cosy'...which reminds me to check out the situation with manufacturing the fleece at *Dawson's Fabrics*.
- July 2nd** Meeting at *Tract*. Received quote for tooling costs for moulding seat and back of chair:
- Seat: £8.08 each, initial tooling cost - £3270.00
 - Back: £7.05 each, initial tooling cost - £2680.00
- Recommended pre-tooling prototyping:
- 'Having discussed this in some detail with Stewart in our tooling shop, the best way forward would be to prototype the chair in cut foam built around the steelwork frame, allowing you to view and approve the shape and comfort. Once approved, *Interfoam* could then make the Mould Pattern around the steelwork to the approved shape. Allow 10-15 working days for the production of the wooden male patterns. These are then submitted to yourselves for approval. (Any minor

alterations being done at this stage) The glass fibre tools would be completed 15-20 working days from pattern approval. Tools could run concurrently.'

Sample and Production Parts:

'Sample parts will be submitted to determine shape and to establish customer's requirements on hardness within 3 days from tool completion. Production of 150 parts per week is possible from one tool.'

Discuss with RH at Fridays meeting.

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| July 5 th | Meeting with RH at <i>Tract</i> 9.30am. <i>Styrofoam</i> seat has been taken away for modelling by <i>Vitafoam</i> ; back is being modelled in <i>Memory Foam</i> by <i>Interfoam</i> (Bedford). I will go to meet then on Mon/Tues next week. RH ordering alternative feet with more secure fixing method. Discussion about webbing of the seat. <i>Interfoam</i> believe that the <i>NHS</i> will demand it? I will call Anne Greer at <i>Gloucester Royal Hospital</i> to discuss on Monday. Took slide photos of prototype. Checklist for Monday: |
| | <ul style="list-style-type: none">• Call Dawson's about fleece development• Call Anne Greer, <i>Gloucestershire Royal Hospital</i>• Call Joanna Moore at <i>Vitra</i> for start times of seminars• Call Chris C; Lyndon B; Richard Levene; Paul W; Kelly D. confirm times and Friday 10th meeting |
| July 12 th | <i>Vitra</i> meeting in college: Chris C and Lyndon B. Wrote notes for distribution at <i>Vitra</i> seminar. |
| July 15 ^{th-16th} | Finished Chapter 2 'Psychology of Breastfeeding' |
| July 17 th | <i>Vitra</i> seminar – discussed proposal with <i>BDP</i> for <i>Design Council</i> ; my Ph.D. and collaboration with <i>Tract</i> |
| July 18 th , 19 th | Work on text to send to Sally Kendall by next Thursday |
| July 24 th | Posted full draft to Sally K. in time for her to bring feedback on Thursday. Interviewed 'Julie' when she came to return the disposable camera, which was the last to be returned. |
| July 26 th | Meeting with RH at <i>Tract</i> . He is concerned about the height of the seat. I observe that the foam used deforms too much (by more than 100mm) so making the seat height too low. We discuss increasing the leg height rather than deepening the seat platform. We will try a seat height of 350mm on the prototype with the foam engineers at <i>Upholstery Trading</i> in High Wycombe (subsidiary of <i>Tract</i>) which They can start with me on August 5 th . |
| July 30 th | Sally Kendall's tutorial. She came to Thame where I took her to see the most up to date prototype and the three earlier ones at the <i>Tract</i> factory where I was also able to show her <i>Tract</i> 's other chairs in the showroom. We discussed the |

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| | presentation/ launch of the chair in October at the <i>CPHVA National Conference</i> in Harrogate. So far, deadline should be met. |
| July 31 st | Wrote biography to fax to the conference organisers in Harrogate. Sent together with photo for their catalogue. |
| Aug 2 nd | Amendments to text suggested by Ray Batchelor, <i>BCUC</i> . David Creighton (<i>BCUC</i>) came over to Thame to help sort out my computer facilities. |
| Aug 5 th | Collected computer from David Creighton. Went to <i>Tract (Upholstery Trading)</i> with RH to meet Kevin, the prototype maker who will be working with me on the next full size model. |
| Aug 6 th | Took a full size drawing on ply former to Kevin at <i>Upholstery Trading</i> , Wycombe. Discussed foams to try. |
| Aug 7 th -9 th | Worked on text to send to Reg Winfield. Wrote physiology of breastfeeding section of Chapter 2. |
| Aug 12 th | Interviewed 'Carly' about the social and practical problems of being a breastfeeding mother with three small children. E.g. Size of pushchairs; attitudes in shops like <i>IKEA</i> ; parking problems, etc. This concludes case study observations for her. |
| Aug 13 th | Prepare text at college to send to Reg tomorrow. |
| Aug 14th | Sent draft to Reg as planned. |

From August 14th until October 31st, my sabbatical period had finished and I found that I divided my time between working at *BCUC* in my role as Principal Lecturer and Course Leader (MA Furniture Design & Technology) and working at *Tract* both in Thame and in Haddenham, making the final prototype for the chair. (It was usual for me to go to one of the factories of *Tract* before work in the mornings!) This was finally completed at the end of October 2002. The photographic evidence illustrated in Chapter 4 most accurately show the development of the chair during this period.

On October 31st 2002 the first finished prototype breastfeeding chair was launched at the CPHVA annual professional conference in Harrogate by myself and Professor Sally Kendall.