DEFROSTING THE FREEZER: FROM NOVELTY TO CONVENIENCE

A Narrative of Normalization

◆ **ELIZABETH SHOVE**

Lancaster University

◆ **DALE SOUTHERTON**

University of Manchester

Abstract

This article examines the 'normalization' of the British freezer. It defines three phases in this process: an initial period oriented around the utility of preserving home produce; a second stage marked by the development of a frozen food infrastructure and the establishment of the freezer as a part of the efficient domestic economy; and a third subtle but significant redefinition of the primary benefits of freezing in terms of convenience. Cast in their new role as 'time machines', freezers are sold as a means of managing contemporary pressures associated with the scheduling and co-ordination of domestic life. At one level, this is a story of the gradual acceptance of a relatively standardized object. Yet this narrative suggests that the freezer's promised benefits and functions change along the way. Developing this point, we argue that the normalization of the chameleon-like freezer can only be understood in the context of similarly changing systems of food provisioning, patterns of domestic practice and allied technological devices.

Key Words ◆ co-determination ◆ convenience ◆ domestic technology ◆ everyday life ◆ normalization

Journal of Material Culture

Vol. 5(3): 301–319 [1359-1835(200011)5:3; 301–319;014327]

1. INTRODUCTION

Taking the British freezer as an example, this article has the dual ambition of re-framing the sociological analysis of material objects and of better understanding the social and technical organization of domestic energy use. The freezer is a good example to take on both counts. Fridges and freezers account for 26 per cent of energy used by all domestic appliances, following space heating and lighting in the league table of UK household energy consumption (DECADE, 1995). Moreover, 30 years ago only 3 per cent of the UK population owned a freezer but by 1995, more than 96 per cent of households had one or more, a rate of diffusion unrivalled by any other kitchen device (DECADE, 1997). Although statistics are only available from 1979, McMeekin and Tomlinson (1998) show that the rate at which freezers became normal in British households did not vary dramatically between social groups. How and why has the freezer become so readily accepted within British homes?

The development of domestic technology has been the subject of much sociological and historical enquiry, sometimes focusing on the evolution of specific objects (Forty, 1986), sometimes on the relationship between technologies and the division and organization of domestic labour (Cowan, 1985; Cockburn, 1994). Though the manufacturing of demand is a relevant consideration, especially when new devices are introduced to the home, narratives of technological development typically show how manufacturers' interests and struggles impinge on the details of design, production and function. Cowan's (1985) analysis of 'how the refrigerator got its hum' is an excellent example of this genre, documenting the battle between gas and electric utilities and its consequences for the form and character of the domestic fridge. Though useful in understanding how the fridge came to be as it is, Cowan's work is not centrally about how fridges or freezers came to be standard, if not essential, household appliances.

Understandably enough, the majority of research and theoretical supposition in the sociology of consumption has concentrated on highly visible and often spectacular forms of consumption (Shove and Warde, 1997; Southerton, 1999), and on the meaning and symbolic potential of individual objects (Willis, 1982; McCracken, 1990; Featherstone, 1991). When such research attends to more mundane domestic items, it tends to focus on the style and appearance of individual objects (Forty, 1986; Corrigan, 1997) or upon things which are expected to carry meaning, such as household furnishing (Madigan and Munro, 1996) and paintings (Cziksentmihaltyi and Rochberg-Halton, 1981; Painter, 1998). Whether concentrating on the role of objects in generating meaning and indicating taste or on their functional properties and promises (for instance, in reducing labour or increasing efficiency), this body of work typically

isolates and abstracts things from the contexts and circumstances in which they are acquired and used.

Policy oriented studies are similarly object-centred. For example, research inspired by the ambition of regulating or limiting domestic energy consumption routinely examines the diffusion of key appliances like washing machines and freezers. Often taking the construction of demand for granted, this kind of enquiry concentrates on householders' energy consuming habits and on the knowledge they have of the environmental consequences of their actions (DECADE, 1995, 1997). Studies of the introduction and impact of energy labelling (Menanteneau, 1997) and of the markets for what are referred to as 'cold' or 'wet' appliances serve particular policy purposes, yet shed little light on the longer term evolution of the 'need' for freezers or their place within the sociotechnical complex of the home.

Theoretical work on how mundane devices become normal, slips between the gaps of these lines of enquiry. Of course the lack of a relevant literature – whether in the sociology of consumption, technology, material culture or policy analysis – might simply reflect the lack of any real problem. Indeed, the question of how the freezer became normal might be answered by showing how its diffusion relates to such factors as the development of the frozen food industry[1] or the relationship between this and changes in the division of domestic labour. Both sorts of correlation are possible. In Britain, female workforce participation increased from 58 per cent to 75 per cent between 1971 and 1997 (Social Trends, 2000) and analyses of household time budgets (Gershuny, 1992) suggest that the co-ordination and management of domestic labour is increasingly problematic. The freezer's popularity might simply be explained by the fact that it promises to alleviate such problems. However, this is to jump the gun and leap to conclusions about the relationship between freezing, time and the organization of domestic life.[2] If we are to understand how freezers found their way into British kitchens, we should take a step back and learn about how they have been promoted and positioned.

In pursuing these themes, we switch between treating the freezer as a member of a wider 'family' of kitchen appliances, and as a device the use and purpose of which is constituted through daily practices and changing patterns of household food provisioning. We argue that it is not enough to consider the freezer as a stand-alone appliance and that we need an approach which situates the object in question within a changing social context, and within a correspondingly dynamic environment of related technologies. With this as our goal, we begin by reviewing the 'multiple histories' which form the social biography of the British freezer (Appadurai, 1986).[3] We group these histories into three phases, basing our account on content analysis of 14 freezer cookery books with publication

dates ranging from 1968 to 1996 (the earliest and most recent freezer cookery books on record)[4] and manufacturers' brochures. In-depth unstructured interviews were conducted with the owners of a small kitchen installation firm and with staff employed in large electrical goods stores. We also visited appliance superstores and small high street outlets sometimes in the guise of potential purchasers.[5] Additional material is provided by 35 in-depth interviews exploring changing tastes and the use of kitchens in suburban households (Southerton, 1999). The range and consistency of data generated by these methods gives a clear sense of the historical development of the British freezer and of the arguments which have been used to define and promote the value of freezing.

2. FREEZING HISTORY

The statistical narrative of the freezer's history is clear enough. Data on freezer ownership reveal a pretty standard diffusion 'curve', as shown in Figure 1.

The lines of the graph inevitably treat the freezer as a standardized item and as such obscure transformations in the freezer's meaning and purpose. Following the same period but with reference to the freezer's position and status as a domestic appliance, we identify three phases of development (Table 1). Phase one covers the introduction of the freezer into the domestic market during the 1960s and 1970s. The second phase, between the 1970s and early 1980s, can be described as a period of establishment in which the freezer is embedded in a normal system of food provisioning. The latest phase, from the mid-1980s onwards, is one in which the freezer is redefined as a necessary device for the co-ordination and management of time.

FIGURE 1 Ownership of freezers, UK 1970–1995 (% of households)
Source: DECADE, 1997

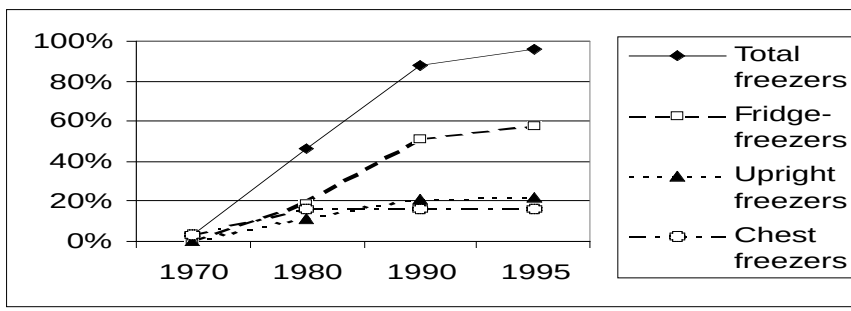


TABLE 1 Multiple histories of the freezer

	Phase 1. Pre-1970s: Introduction	*Phase 2. 1970–1980s Establishment*	*Phase 3. 1980–: Redefinition*
Technical characteristics	Compression or absorption. Chest or upright	Fridge-freezer, fast freeze, microwaves	No CfCs, frost-free, energy labelling
Sales narrative	Novelty, the latest technology from industry to the home	Labour-saving device for the efficient and healthy household	Normal device for the convenient home
Style and design	White, free-standing, isolated in the garage	Moves from garage to kitchen, becomes a standardized, modularized appliance	Colours, high-tech gadgets, integrated appliances and the stylish kitchen
Imagined consumers	Niche market for those with a lot of home produce	For the competent housewife and the modern, efficient home	Taken-for-granted object of mass consumption, essential for domestic organization
Use	Freeze gluts of home grown fruit and vegetables	Freeze batches of cooking, bulk buying and reserve stocks	Store essential food-stuffs and convenience meals
Benefits	Long-term storage of home-grown produce to beat the seasons	Modernize household organization for efficient economy	Imperative of convenience in the management of everyday life

The following sections highlight key features of these three moments with the aim of tracing threads of continuity in the freezer's journey from novelty to normality, and of showing the distinctive, relatively self-contained characteristics of each moment.

2.1 INTRODUCTION: 1960–1970

To stand any chance of success, freezer manufacturers had to persuade people to adopt new methods of food preservation in place of established techniques like salting, bottling, curing, drying and tinning. More challenging still, they had to convince potential users that freezing, which modifies the structure of the food itself, was safe. What sort of preservational magic did the new white box represent? One positive strategy was to announce the freezer as a symbol of technological progress.

Freezer experts were quick to point to the fact that the technology

was already established in industry and in food transportation (Williams, 1982). Early freezer cookery books also highlighted the scientific principles of freezing and underlined their proven value in the commercial sector. This might have been a risky strategy. As Corrigan (1997) notes, efforts to mechanize the domestic sphere frequently foundered on a persistent ambivalence about the relationship between home (symbolic of the private realm of non-work) and industry (which represents the public world of work). Forty (1986) suggests that the design of cold appliances – their functional styling, their pure white appearance – helped overcome this ambivalence by tapping into themes of household efficiency, hygiene and order: themes focused around the moral welfare of the family and the dominant cultural meaning of 'home' in the post-war period. In design, if not function, the freezer eased its way into the home through association with existing domestic technologies and the ideologies that they embodied.

Despite the domestication of industrial technology through this 'softer' reference to home efficiency and family welfare, the domestic freezer got off to a relatively slow start. We suggest that this was due to an initially primitive construction of demand. To begin with, the only people who really stood to benefit were those confronting seasonal 'problems' of over production. The freezer was first marketed to the housewife who could freeze her home baking, her home grown crops of fruit and vegetables, and perhaps her own pig. New skills had to be acquired for the mastery of freezing depended, at this stage, on the effective blanching of vegetables, the precise timing of freezing to preserve fruit in the best possible condition, appropriate packaging, labelling, and so on. Providing this knowledge was in place, the freezer's purpose and novelty lay in its 'ability to beat the seasons . . . to freeze summer fruits and eat them in the winter' (Norwak, 1969). At this point in its history, the freezer required a substantial supply of suitable food, carefully and properly prepared by its owner.

2.2. Establishment: 1970–1980

Content analysis of freezer cookery books and interview data suggest that the freezer did not establish itself on any significant scale until the early to mid-1970s. Statistics of household freezer ownership support this suggestion (see Figure 1). During the early 1970s, the freezer made the transition from niche to mass market.

This phase is marked by a handful of technological developments. First, a move from absorption to compression technology dramatically reduced the initial cost of a freezer.[6] Second, the early 1970s saw the introduction of refrigerators with small compartments for frozen food. As our freezer retailer respondents explained, this second development

had the very important function of placing freezer technology (if not freezers themselves) into many homes, so introducing a whole new population to the methods and science of freezing. Experts of the day were nonetheless keen to distinguish between real freezers and freezer compartments on the grounds that the former were 'better at freezing'. This distinction was based on a third technological advancement, that of 'fast freezing', which was only found in 'real' freezers. The rate of freezing affects the quality of the result and with the advent of fast freezing it was possible to claim that frozen and defrosted food would have the same nutrients and taste as when fresh: [7]

> Food which is quickly frozen not only remains preserved; it comes out of the freezer full of flavour, bright in colour, with texture unimpaired by a stay of several months, or in some cases even a year. (Ellis, 1973: 21)

The capacity for fast freezing extended the repertoire of potential benefits. Previously restricted to 'beating the seasons', the vocabulary of advantages soon expanded to include promises of health, freshness and economy.

More prosaically, consumers were now able to choose between chest or upright formats. At this point chest freezers were most popular, usually being larger and more efficient than upright designs. The relative merits of each were much discussed and advice was on hand along with simple equations to help households select the 'right' size.

> The chest freezer has marvellous storage capacity and is more economical to run than the upright because of its top opening lid . . . for needs of the average-sized family a freezer of at least 10 cu ft is deemed essential, or 3 cu ft per person plus 2 extra cu ft for occasional entertaining. (Ellis, 1973: 17)

In this extract from one of Audrey Ellis' many freezer cookery books, the freezer figures as an essentially utilitarian object: not only can you calculate the size required for your family, you can also estimate the quantity of food to be stored and the length of time for which it can be kept.

Reducing cost, the potential for fast freezing and the introduction of the upright format are all important features, yet the really critical development was the rapid expansion of superstores and with them an extensive and reliable commercial infrastructure for frozen food.[8] In Britain, the first self-service grocery stores were introduced in the 1950s but it was not until the late 1960s that large supermarkets were developed on any scale.[9] The first specialist frozen food store, 'Iceland', opened in 1970. By the early 1990s there were some 800 'Iceland stores' (Iceland Corporate Relations Department, 2000), and many frozen food counters in supermarkets up and down the country.[10]

With the arrival of large scale superstores, as well as increased rates of car ownership, the benefits of owning a freezer increased exponentially.

Not only did they allow households to store food for long periods, the possibility of bulk buying and the availability of ready-frozen products created further opportunities for rationalizing household provisioning. As the authors of freezer cookery books explain:

> [H]aving a freezer means that you can take advantage of any bulk-buying special offers of perishable foods. Careful shopping, a beady eye and a freezer can certainly pay dividends. (Rennie, 1973: 7)

> To sum up, adding a freezer to your domestic equipment will allow you to cater more economically and more flexibly; to control the output of your own energy in a way you never could before . . . cooking . . . can be done at times which suit you better. (Ellis, 1973: 5)

The list of the freezer's benefits continued to grow. By the mid-1970s it allowed the competent housewife to order her daily routine; to cook at her convenience; to plan trips to the supermarket; and to maintain and manage a much greater variety of meals or ingredients ready and available for consumption all year round. Freezers did not solve all the problems of modern life but they helped cope with the pace and pressure of events at home and work. Promised economies of time and money go hand in hand in this final example:

> Economy means different things to different people, some are more short of time, like the working housewife, some are more short of effort, like the elderly and the handicapped, and it would seem that all of us are short of money in these days of ever-increasing prices. Is there anything the housewife can do to keep pace with the rising cost of living, the increasing pressure of daily life and the shortage of hours in the day? One answer to her problems is the HOME FREEZER. Imagine all the foods you walk around several shops to buy, all in your own kitchen, and at the most reasonable prices. (Hastrop, 1972: 1)

By now the benefits are overwhelming. So much so that freezers are presented as necessary rather than optional appliances for the modern household. In the extracts quoted here, there is nothing extravagant about the freezer or its contents. Freezer-dependant foods such as burgers, pizzas and ice cream have become normal, as have expectations of bulk buying and the experience of having a mini-supermarket within 'your own kitchen'.

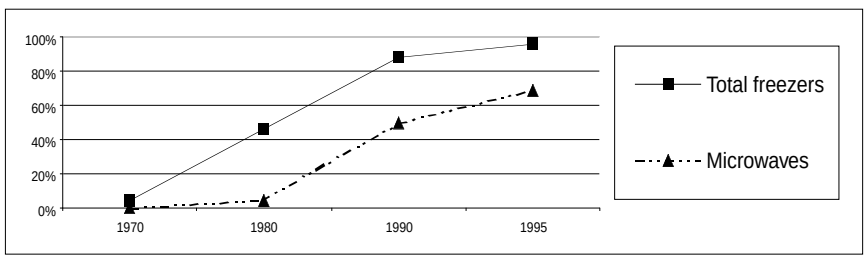
Reference to the kitchen location marks another key development in the freezer's biography. In the early 1970s, the freezer was a large rather awkwardly shaped coffin, commonly located in the garage. By the end of the decade it had become a much more accessible appliance designed to belong in a standard fitted kitchen. In order to understand how this came about, we need to consider parallel changes in kitchen design and the introduction of related kitchen technologies.

The concept of the 'fitted' kitchen represented something of a revolution in domestic infrastructure. The basic principle was that all appliances fitted into ready-made spaces beneath a continuous work surface. The fitted kitchen could be bought as a standard package and with this idea in place, the kitchen itself became a commodity. Having selected a 'kitchen' from a showroom, and having had the relevant kitchen units installed, customers slid their appliances into place. This development had important consequences for the design of fridges and freezers. Until this point, refrigerators, like freezers, bore no dimensional relationship to cookers, sinks or cupboards. Though contributing to the theme of white efficiency, they were stand-alone items. As one of our kitchen designers explained, the fitted kitchen imposed new demands: forcing fridges to square up and squash down below the 600 mm threshold of the standard work top. This same development, combined with the changing patterns of use described earlier, allowed the freezer to finally come in from the cold. Two of our freezer retailer respondents suggested that the move from garage to kitchen symbolized the growing importance of freezing in the ordering of domestic life and signalled the freezer's new identity as one amongst other essential appliances. Although standing higher than the average work top, new two-storey hybrids – called 'fridge-freezers' – promised an even more efficient use of space and cooling technology.

The freezer's acceptance within the kitchen may also relate to the introduction of the microwave.[11] Although first available on the domestic market in the late 1970s (McMeekin and Tomlinson, 1998), it was not until the early 1980s that microwave cookers found their way into British homes in any significant number. (See Figure 2.)

Whatever their benefits, freezers have one major drawback: they freeze things solid. Initially marketed as ovens in their own right, the popularity of the microwave is arguably related to its ability to defrost

FIGURE 2 British household ownership of kitchen appliances 1970–95 (% of households)
Source: DECADE, 1997



and re-heat.[12] Though accustomed to freezing, some consumers remain wary of what microwaving might do to their food. The following quotation implies a lingering anxiety on this point[13] but also illustrates the advantages of combining fast freezing with fast defrosting.

> **Peter**: We do have a small microwave which is only used for defrosting. It is not used very often now because we are home for a lot of the time and can let things defrost naturally, which I think is much better health and taste wise. I wouldn't dream of actually cooking something in the microwave for the same reasons. (Aged 64, financial consultant)

Despite such ambivalence, the alliance between microwave and freezer marked a turning point in the freezer's biography. The microwave's capacity for rapid defrosting appears to have paved the way for a new interpretation of the freezer's benefits and a new emphasis on time and convenience.

Looking back at the 1970s, themes of efficiency dominate. The freezer is positioned and represented as a device which promises economic efficiencies in terms of bulk buying and infrequent shopping, and efficiencies of household management and cooking. Its move into the home and its acceptance as a central rather than a peripheral appliance is in turn related to the rationalization of space within the fitted kitchen. The freezer's progress during these years was evidently aided by a surrounding frozen food infrastructure, and by a network of related technologies including the microwave and the proliferation of freezer-dependent food. Having become normal on these terms, the freezer seems to have adapted to new conditions and demands emerging from the 1980s onwards.

2.3. REDEFINITION: 1980S ONWARDS

Recent developments in freezer technology have been contradictory. Some reflect increasing concern with energy efficiency and the environment. For example, following the Montreal protocol, CfCs have been phased out. In an effort to promote more efficient appliances, the EU introduced an energy labelling system, use of which has been mandatory in the UK since April 1997 (DECADE, 1995, 1997; Menanteau, 1997). Cold appliances have come in for other forms of environmental attention: Greenpeace has, for instance, sponsored the development of new, 'green' fridges.

At the same time, there seems to be a trend for ever larger fridge-freezers. Though European models are still roughly half the size of those sold in the USA,[14] American style 'Food Centres' are now on sale in larger retail outlets in the UK. The promotion of 'frost-free' freezers

represents another recent development. 'Frost free' appliances include a de-humidifier and fan, they cost approximately £100 more than their non-frost-free equivalent, and are considerably less efficient to run. They are, however, more 'convenient' in that they never need defrosting and do not require regular de- and re-stocking. Discussing the benefits of frost-free models, a retailer homed in on themes of time and 'hassle':

> Frost-free is now very popular because they [i.e. frost-free freezers] are so convenient, they not only save the time it takes to defrost, they also save the hassle. Defrosting is a major job which requires either eating the freezer down, which is a hassle in itself as you have no food stocks, or it means emptying the freezer and trying to defrost it as quickly as possible . . . Frost-free saves on all that and means you don't have to worry.

This interpretation takes the economic benefits of the freezer for granted and concentrates instead on the promised convenience of frost-free technology. In this case, arguments about the efficient use of time come to the fore, subsuming but not necessarily replacing the previous emphasis on economic efficiency.

Having made the step from garage to home, the freezer has become embedded in the fabric of 'integrated' as well as fitted kitchens. The concept of integration, introduced in the mid-1990s, involves the co-ordination of all kitchen appliances and hardware (cupboards, work surface etc.) in terms of colour and style. Major appliances are typically hidden behind a matching suite of 'cupboard' fronts. Meanwhile, smaller items still on display – such as the microwave, toaster and kettle – conform to a stylistic theme and a colour code of, for example, bottle green with features picked out in gold.

As one of our kitchen designer respondents explains: '15 years ago kitchens were built and then the appliances installed, today appliances are installed and kitchens are built around them'. Freezer retailers echoed these sentiments, describing how integration and co-ordination now count for more than specific characteristics, such as the efficiency or volume of individual appliances. This creates a new environment for freezer manufacturers who are confronted with two possible strategies: one is to make appliances which melt into 'integrated' colour schemes, and to offer freezers in red, green, steely charcoal, deep blue, etc. An alternative is to draw attention to the product as a distinctive element within otherwise co-ordinated kitchen-scapes. Manufacturers opting for this route have, for instance, produced appliances which are themselves 'works of art': one design features an image of skyscrapers; another illustrates a giant strawberry.[15]

Integration at the level of design appears to co-exist with specialization at the level of function. The proliferation of freezers has, for instance, transformed the role of fridges, leading to a significant reduction in the

range of models which include frozen food compartments. As one retailer observed:

> larder fridges were introduced about 10–15 years ago, which are fridges without freezer compartments. This is a direct indicator of when freezers became normal in all households, as everyone had a freezer, there was no longer the need for fridges with freeze boxes.

The rapid decline in the range and availability of specialist freezer cook books is as telling an indicator as any of the extent to which the freezer has become normal. The proliferation of such books in the 1970s illustrated demand for new forms of expertise on the part of novice freezer operators. In the 1990s such knowledge was either redundant or else totally taken for granted.[16] The redundancy of specialist knowledge may relate to the way the freezer is being used. We do not have any detailed evidence, but a number of our interviewees suggested that the contents of the freezer have also changed over time. This first observation, by a freezer retailer, identified two rather different uses.

> People install their lovely new freezer and load it up with the special offers from Sainsburys, such as the buy two loaves, get one free offers. Not only does this save money but it means they have a reserve stock of essentials for emergencies . . . It's not bulk buying as such because people now shop more regularly, once or twice a week as they want all the fresh stuff. No, the freezer is for the basic essentials and ready meals.

A kitchen designer makes a very similar point, also differentiating between bulk storage of 'basics' and instantly available convenience food.

> In the seventies, people had immense things, this gigantic freezer, which they filled with everything, a month's worth of shopping, left-overs, batch baking and of course veg. But, since the little upright things which go under work tops came in, things changed as you had less room in your freezer, but it was easier to use as it was in your kitchen, not down the end of your garden. Of course now, when I look in most people's freezer – which I often do so that I can gauge the size of the appliance they will want – they mainly fill 'um with packet stuff, you know Birds Eye lasagne, and the basics, bread and milk, peas remain but people prefer fresh veg on the whole nowadays. Oh and pizza.

By these accounts, the freezers of the 1990s have two quite distinct roles: one as the storehouses of bulky but 'essential' commodities, such as bread, frozen vegetables, and milk; the other as the location of a varied range of convenience foods. These roles reflect the (perhaps temporary) reduction of frozen space associated with the modern integrated kitchen and the dramatic increase in the range of ready-frozen food.

If the 1970s growth of superstore shopping opened the way for the freezer's establishment, the development of convenience foods (Gofton,

1995) has altered its associated benefits and the practices it permits. While it would be dangerous to claim that the freezer has transformed our diet, it is plausible to suggest that it has played an important part in changing patterns of food provisioning, and that this role is both dependent on and constitutive of the food industry at large (Hewitt, 1993; Warde, 1999).

This brings us back to the question of time. As the following quotations suggest, the particular form of convenience which the freezer offers is one associated not with the saving of time but with ordering, scheduling, co-ordination and timing.

> **Colin**: I think we are all pushed for time nowadays, so if you've got stuff in the freezer it doesn't necessarily matter if one of us can't get to the shop, you know, it just makes things a bit easier, one less thing to worry about. (Aged 44, police officer)

> **Nicola**: I wouldn't say I buy things in bulk, but things like bread . . . well I buy that . . . it's good to have them for reserve and that, saves having to nip out at times when you haven't really got the time. We put the other usual things in there, you know some ready-meals and frozen veg for when we're caught short. (Aged 38, nurse)

For these people, the benefits of the freezer revolve around the potential for juggling and managing time. Freezers provide the convenience of ready access, rapid preparation and the security of long-term storage. These time-related arguments represent an elaboration of earlier narratives rather than a total overhauling of anticipated benefit. As before, freezers still make it possible to take advantage of special offers and one-off price reductions, but now it is the time which counts. If the freezer is 'necessary', then it is so not because it is necessary to have frozen food, but because it has become increasingly important to manage time and domestic labour in ways that only freezers allow. That is the need to which freezing now represents a response.

3. BEING AND BECOMING NORMAL

What can we learn from this three phase analysis of the British freezer and what does this case tell us about the ways in which ordinary devices become normal? We began by asking what the freezer was for, and have seen how narratives of benefits emerge and build up over time. Advantages which were heavily promoted in the 1970s have not been forgotten but have become established and so taken for granted. Features like the quality of 'convenience' are not entirely novel but come to the fore as interpretations of the main purpose of the freezer evolve. Despite these elements of continuity, we suggest that the perceived role of the freezer has changed significantly during the course of its development.

It would therefore be wrong to read the account given in this article as an unfolding narrative of a stable object. Rather as Bijker (1992) tracks the transformation of the fluorescent light and its invention through diffusion, we recognize the reinvention of the freezer through the process of normalization and beyond. Despite its persistently white disguise, the chameleon-like freezer takes on the spots and stripes of its surroundings. It is, for instance, a symbol of modernization in the 1970s, a pre-condition for domestic and economic efficiency in the 1980s and a device of convenience in the busy 1990s.

While we have traced an apparently sequential course of events, we have also noted the extent to which the freezer's history has been tied up with developments in the rest of the kitchen, and with the parallel careers of other devices and appliances. Although they have different technological ancestries, the freezer, like the fridge and the cooker, share something of a common history, starting life as stand-alone objects then being incorporated first into fitted, and then integrated kitchen designs. Yet it is not only a question of appearance. The evolving functions of the freezer are also bound up with changes in the way that households feed themselves, whether they relate to the development of supermarkets, the mass-production of convenience foods or the introduction of the microwave.

To the extent that the perceived benefits of the freezer are caught within a web of inter-dependent technologies and practices, it makes sense to see the shape and form of the freezer as a consequence of the context into which it fits. Estimates of how much frozen space households 'require' illustrates this elastic aspect of the freezer's history. While size makes a difference to the amount of food that can be stored at any one moment, and (depending on use) the frequency with which the freezer has to be replenished, it is an essentially arbitrary feature. British freezers have grown and shrunk at different points in their history, their size and volume relating as much to the imperatives of kitchen design as to family size or apparent 'need'.

Yet the freezer is not a totally responsive device. In Akrich's terms, it also has a script of its own (1992). From the moment of purchase on, freezer owners are obliged to behave in certain ways: they have to learn the likes and dislikes of their new acquisition (it likes ice cream, it doesn't like potatoes); they have to take special steps to prepare food for freezing; they have no option but to wait, sometimes for hours, before they can make proper use of deep-frozen food; and so on. Although the freezer does allow its users to re-order shopping, cooking and eating practices, freezing, thawing and defrosting impose demands of their own.

As described here, the business of becoming normal involves a two-way process in which freezers respond to their surroundings and at the

same time impose something of their own script. This intricate to-ing and fro-ing is however, marked by more significant shifts in consumers' understandings of what freezers are for. In the first phase, freezers were essentially good for managing seasonal gluts of food; in the second their main purpose lay in the more efficient management of the household economy. Today, the freezer is perhaps best seen as a 'time machine': that is as a device with which to manage the otherwise intolerable demands of scheduling, ordering and co-ordination (Warde, 1999). As Bruce Hackett and Loren Lutzenhiser (1985) observe what freezers (or in their case, fridges) are good for 'is a consequence not a determinant of their use'. Although our review is apparently about freezers, we have taken these devices and the ways in which they are used to be indicative of the challenges and demands of domestic life. Approached in this way, careful investigation of freezers (or of other domestic devices) promises to tell us much about the structure and character of the social worlds in which they are situated. Further reflection on the contemporary role of the freezer illustrates the potential of such a strategy and reveals tensions and levels of inter-dependence and co-determination relevant for an understanding of the escalation and persistence of unsustainable consumption.

The freezers of today promise to help people cope with the compression and fragmentation of time. But in so doing they lock their users into certain practices and habits, at the same time requiring an extensive if routinely invisible supporting infrastructure. As well as depending on a reliable electricity supply, and accommodating kitchen designs, freezers presuppose a network of manufacturers, frozen-food producers, global transport systems and agricultural practices.

At the level of the individual household, the freezer might well help to redistribute time and labour and alleviate some of the pressures of modern life. On the other hand, those pressures are in part a consequence of just such (re)distributions of time and labour. Though sold in the name of convenience, freezers help manufacture some of the problems to which they represent a response. Even within households, gadgets and appliances script the actions of their users in ways which simultaneously create the illusion of choice while also closing avenues of possible action. It might be a bit of an exaggeration to suggest that freezers rule people's lives but there is a grain of truth to the broader observation that the proliferation of energy consuming convenience devices has the unintended consequence of tying people into an ever denser network of inter-dependent, perhaps even dependent, relationships with the very things designed to free them from just such obligations.

In conclusion, our strategy of persistently asking 'what is the freezer for?' has led us to develop a means of investigating ordinary technologies which has a number of distinctive features. Rather than looking at

the object alone we have been forced to take account of its changing position within a web of co-determining practices and arrangements including the development of supermarkets, the proliferation of frozen food, the introduction of the microwave and the transformation of kitchen design. As part of this still shifting scene, the freezer's purpose (like the purpose of other domestic technologies) is subject to continual negotiation and redefinition. It is not clear where the contemporary spiral of time-related pressures might lead nor what part the freezer might play in the future. Although the freezer has become normal, its role and purpose is far from static. A second consequence of explicitly recognizing the mutual scripting of devices and their surroundings is that it allows us to shuttle between the analysis of object and context, and to follow the threads of co-determination that link individual devices, domestic practices and social and technical infrastructures. Though we began with a rather innocent question: 'how is it that energy consuming devices like the freezer become normal?' we have ended up with a picture of escalating demand for appliances which promise to solve macro-level problems which are, to some extent, problems of their own making. Again our strategy forces us to focus on the relationship between micro-level developments in freezer design, and wide ranging transformations in the ordering and scheduling of domestic life and the provisioning of food.

There are limits to this approach. Household appliances do not embody every aspect of social order, nor should we expect to discern the prospects for sustainable consumption in the details of their design. But, by opening up the 'white box' of the freezer we have been able to capture aspects of ordinary consumption which would otherwise have slipped the net. In particular, we have been able to follow the transformation of sociotechnical regimes and systems of consumption and practice from the perspective of one ever-changing device.

Notes

1. In 1996, the three largest commercial supermarket chains in Britain attracted 20 million customers per week (a third of the population) and accounted for 36 per cent of retail sales in the grocery sector (Humphery, 1998). This is significant given that the major supermarkets are by far the most important providers of frozen food.
2. The freezer, in combination with ready meals and convenience food may have a part to play in redistributing domestic roles within the household. Husbands, wives, and children may each use the freezer in very different ways, with important implications for the provisioning of food within the household. Unfortunately, we do not have any data on this aspect of freezing.
3. This is a distinctively British trajectory. Related research in Finland (Pantzar, 1998) and Norway (Strandbakken, 1998) suggests that there are different

narratives of 'normalization'. In Finland, in particular, the benefits of freezing were influenced by the state which actively promoted freezers and provided advice and guidance on the benefits of freezing home grown produce.

4. According to the computer database of the book retailer Waterstones.

5. Eleven stores were visited.

6. One freezer retailer informant claimed that initial and running costs fell by around 20 per cent during this period.

7. Strawberries and salmon continue to present the freezer's greatest challenge (Pantzar, 1998); other foods such as potatoes, whole peppers and some dairy products are classed as unfreezable while some products like bread and peas are particularly good at being frozen.

8. The widespread development of the frozen food system created opportunities for new industries and new divisions of labour. Ready-frozen pasties embody labour as well as meat and potato. Though not a central part of our story, it is important to recognize that the frozen food system has permitted previously unimaginable relationships between producers and consumers.

9. A supermarket is industrially defined as any store with a selling area between 400 and 2500 m^2 that sells at least 70 per cent foodstuffs. A grocery superstore is defined as having a sales space of over 2500 m^2 (Humphery, 1998). Interestingly, the United States led this large scale superstore phenomena, being approximately 10 years ahead of the British market (Humphery, 1998), a time-scale that corresponds with the United States' introduction of home freezers to the domestic market in the 1950s (Pantzar, 1998).

10. Data from J. Sainsburys illustrates the rate at which the size of supermarkets has increased. In 1960 there were 256 stores with an average floor sales area of 1750 m^2. By 1994, there were 341 stores with an average floor area of 9150 m^2 (Sainsbury's Corporate Relations Department, 1996).

11. The microwave has never really fitted in the fitted kitchen – it is usually to be found jostling for space with other awkwardly shaped items like the toaster and the kettle.

12. A microwave user survey conducted by the UK Consumers' Association (1998) revealed that defrosting and re-heating accounted for 80 per cent of microwave usage.

13. Ambivalence about microwave technology was strongest for elderly interviewees, but was a shared sentiment for a significant number of those interviewed in the Southerton (1999) study.

14. The smallest fridge/freezers available in a selection of retail outlets in Seattle, USA were 18–22 cu ft whereas Currys and Comet typically sell fridge-freezers of between 9 and 10 cu ft.

15. In the USA, the fridge-freezer has an established role if not as an art work then at least as a notice-board: lists, photos, instructions, notes and timetables are held in place with a range of inventively designed fridge magnets – some of which also have a pedagogic purpose, magnetic letters to assist young children with spelling being a good example. This is less common in the UK, a feature which is perhaps explained by our respondents' preferences for kitchens which avoid 'fuss' and 'clutter' (Southerton, 2000).

16. Book stores no longer stock freezer books. Only two have been published since 1984, both produced by Age Concern.

References

Akrich, M. (1992) 'The De-scription of Technical Objects', in W. Bijker, and J. Law. (eds) *Shaping Technology/Building Society. Studies in Sociotechnical Change*. Cambridge, MA: MIT Press.

Appadurai, A. (1986) *The Social Life Of Things*. Cambridge: Cambridge University Press.

Bijker, W. (1992) 'The Social Construction of Fluorescent Lighting, Or How an Artefact Was Invented in its Diffusion Stage' in W. Bijker and J. Law (eds) *Shaping Technology/Building Society, Studies in Sociotechnical Change*. Cambridge, MA: MIT Press.

Cockburn, C. (1994) 'Bringing Technology Home: Gender and Technology in Changing Europe', in C. Cockburn and R. Furst-Dilic (eds), Buckingham: Open University Press.

Consumers' Association (1998) 'Microwave Ovens: results of postal survey'.

Corrigan, P. (1997) *The Sociology of Consumption*. London: Sage.

Cowan, R. (1985) 'How the Refrigerator Got its Hum', in D. Mackenzie and J. Wajcman (eds) *The Social Shaping of Technology*. Buckingham: Open University Press.

Cziksentmihaltyi, M. and Rochberg-Halton, E. (1981) *The Meaning of Things: Domestic Symbols and the Self*. Cambridge: Cambridge University Press.

DECADE (1995) *Second Year Report*. Energy and Environment programme. Environmental Change Unit, University of Oxford.

DECADE (1997) *Transforming the UK Cold Market*. Energy and Environment programme. Environmental Change Unit, University of Oxford.

Ellis, A. (1973) *All About Home Freezing*. London: Hamlyn.

Featherstone, M. (1991) *Consumer Culture and Postmodernism*. London: Sage.

Forty, A. (1986) *Objects of Desire: Design and Society since 1750*. London: Thames and Hudson.

Gofton, L. (1995) 'Convenience and the Moral Status of Consumer Practices', in D. Marshall (ed.) *Food Choice and the Consumer*. Glasgow: Blackie.

Gurshuny, J. (1992) 'Change in the Domestic Division of Labour in the UK, 1975–1987: Dependent Labour Versus Adaptive Partnership', in N. Abercrombie and A. Warde (eds) *Social Change in Contemporary Britain*. Cambridge: Polity.

Hackett, B. and Lutzenhiser, L. (1985) *Self-Object Unity*. American Folklore Society.

Hastrop, K. (1972) *The Freezer Cook Book*. London: Collins.

Hewitt, P. (1993) *About Time: the Revolution in Work and Family Life*. London: IPPR/Rivers Oram Press.

Humphery, K. (1998) *Shelf Life: Supermarkets and the Changing Cultures of Consumption*. Cambridge: Cambridge University Press.

Iceland Corporate Relations Department (2000) *From Punnets to Pallets: the Story of Iceland*. London.

Madigan, R. and Munro, M. (1996) '"House Beautiful": style and consumption in the home', *Sociology* 30: 41–57.

McCracken, G. (1990) *Culture and Consumption: New Approaches to the Symbolic Character of Consumer Goods and Activities*. Bloomington: Indiana University Press.

McMeekin, A. and Tomlinson, M. (1998) 'Diffusion with Distinction: the Diffusion of Household Durables in the UK', *Futures*, 30(9) pp. 873–86.

Menanteau, P. (1997) *Energy Efficiency Labelling for Appliances: a New Use of an Old Instrument in the French Region 'Nord / Pas de Calais'*. Institute of Energy Policy and Economics (IEPE-CNRS).

Norwak, M. (1969) *Deep Freezing: a New and Comprehensive Guide to Deep Freezing*. London: Sphere.
Painter, C. (1998) *The Uses of an Artist: Constable in Constable Country Now*. Ipswich Borough Council Museums and Galleries.
Pantzar, M (1998) 'How did the freezer find its way into Finland?', paper to ESF Conference, Lancaster University, UK, March.
Rennie, C. (1973) *Freezer Feast: Cooking for and from the Freezer*. London: Collins Clear-Type Press.
Sainsbury's Corporate Relations Department (1996). *Some Facts about J. Sainsburys plc*. London.
Shove, E. and Warde, A. (1997) 'Inconspicuous Consumption: the Sociology of Consumption, Lifestyles and the Environment', paper to ISA Research Committee 24, Environment and Society, Wageningen Agricultural University, The Netherlands, March 1997.
Southerton, D. (1999) 'Capital Resources and Geographical Mobility: Consumption and Identification in a New Town'. PhD Thesis, Lancaster University.
Southerton, D. (2000) 'Ordinary and Distinctive Consumption; or a Kitchen is a Kitchen is a Kitchen', in J. Gronow and A. Warde (eds) *Ordinary Consumption*. London: Harwood Press.
Strandbakken, P. (1998) 'Domesticating the Freezer', paper to ESF conference, Lancaster University, UK, March.
Warde, A. (1999) Convenience Food: Space and Timing', *British Food Journal*, 101(7): 518–27.
Williams, T. (1982) *A Short History of Twentieth-Century Technology*. Oxford: Clarendon Press.
Willis, P. (1982) 'The Motor-bike and Motor-bike Culture', in B. Weiss et al. (eds) *Popular Culture: Past and Present*. Buckingham: Open University Press.

◆ **ELIZABETH SHOVE** is Director of the Centre for Science Studies at Lancaster University. Her current research interests include the sociology of convenience, comfort and cleanliness. She also works on energy, the built environment and research and science policy. *Address*: Centre for Science Studies, Bowland Tower South, Lancaster University, Lancaster LA1 4AT, UK. [email: e.shove@lancaster.ac.uk]

◆ **DALE SOUTHERTON** is a research fellow at the ESRC Centre for Research on Innovation and Competition at the University of Manchester. His current research interests include time and the coordination of everyday life. He also works on social networks, consumption and differentiation. *Address*: ESRC Centre for Research on Innovation and Competition, The University of Manchester, Tom Lupton Suite, University Precinct Centre, Oxford Road, Manchester M13 9QH, UK. [email: Dale.Southerton@man.ac.uk]