

**Environment, technology and alienation.
An anthropological study among modern dairy farmers
in Uruguay.**

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Social Studies

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Abstract

This dissertation focuses on the processes involved in the mutual constitution of the natural environment and human society among modern dairy farmers in the southern region of the República Oriental del Uruguay. Mainstream ecological and economic anthropology maintains the essentialist dichotomy between Western and non-Western cultures, based —among other assumptions— on the premise that, in the former, nature is experienced and conceived as disembedded from human social life. In contrast, these anthropologists argue, among non-Western or pre-industrial societies, relations between people and the non-human components of the environment are not divorced from the social fabric. In opposition to this pervasive dichotomous model, this dissertation shows that people's practices, attitudes and values regarding the environment can oscillate between engagement and detachment.

The theoretical framework of the thesis starts from an ontological position that conceives human knowledge of the environment as constituted in praxis. The issues addressed relate to the place of modern technologies in the unfolding of environmental affordances, the effects of the encounter between technology and social reproduction and the consequent emergence of different cultural valuations of the environment among rural dwellers. Actual relations between people and places, the perception of ecological events and attitudes towards time, and the perception of artefacts and domestic animals in working settings, are analysed in the context of local, national and global history.

The study draws on a twelve-month period of fieldwork carried out primarily among *Canario* family dairy farmers in Villa del Rosario, a rural area in the upper part of the Santa Lucía river valley, in the Province of Lavalleja, Uruguay. The research methods employed included participant observation, artefactual apprenticeship, and a survey of 24 dairy farms; in-depth interviews with rural extensionists and dairying experts; and the recording of life-histories among elders. Historical records from official archives and the mass media were also consulted.

The main conclusion is that the modernisation of agriculture and the integration of agribusiness in southern Uruguay has led *Canario* dairy farmers to pursue their livelihoods in a way that leads to an intense engagement with their natural and social environments. At the same time, there are signs of institutional alienation, which increasingly affects local people's perception and representations of their environment, informed by the reification of both social and ecological relations. It also shows that people's agency is constituted in particular contexts, where received social and ecological relations can impose strong limits on personal and collective action.

This dissertation contributes, first, to ecological and economic anthropology, by stressing the need to take seriously the mutuality of natural and social forces in the development of the particular ways in which humans relate to their environments. It also offers a contribution to the current debate about the validity of the traditional distinction between Western and non-Western cultures, by suggesting that this conceptual separation should not be taken for granted, but rather requires empirical verification. Finally, it provides ethnographic material from a little studied area of Latin America, thus filling a gap in the existing anthropological literature.

Declaration of originality of work

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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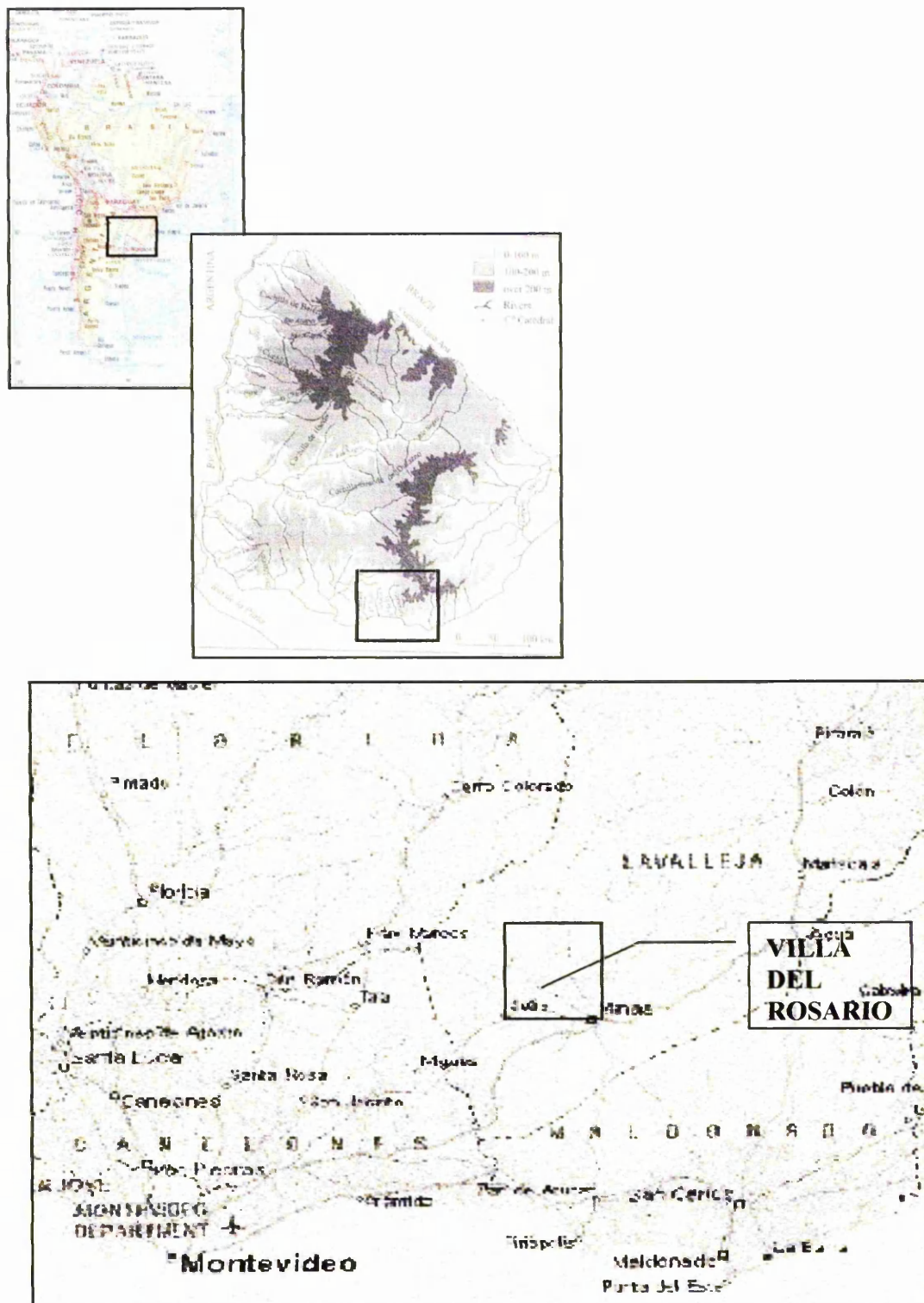


Figure 1. Location of fieldwork.

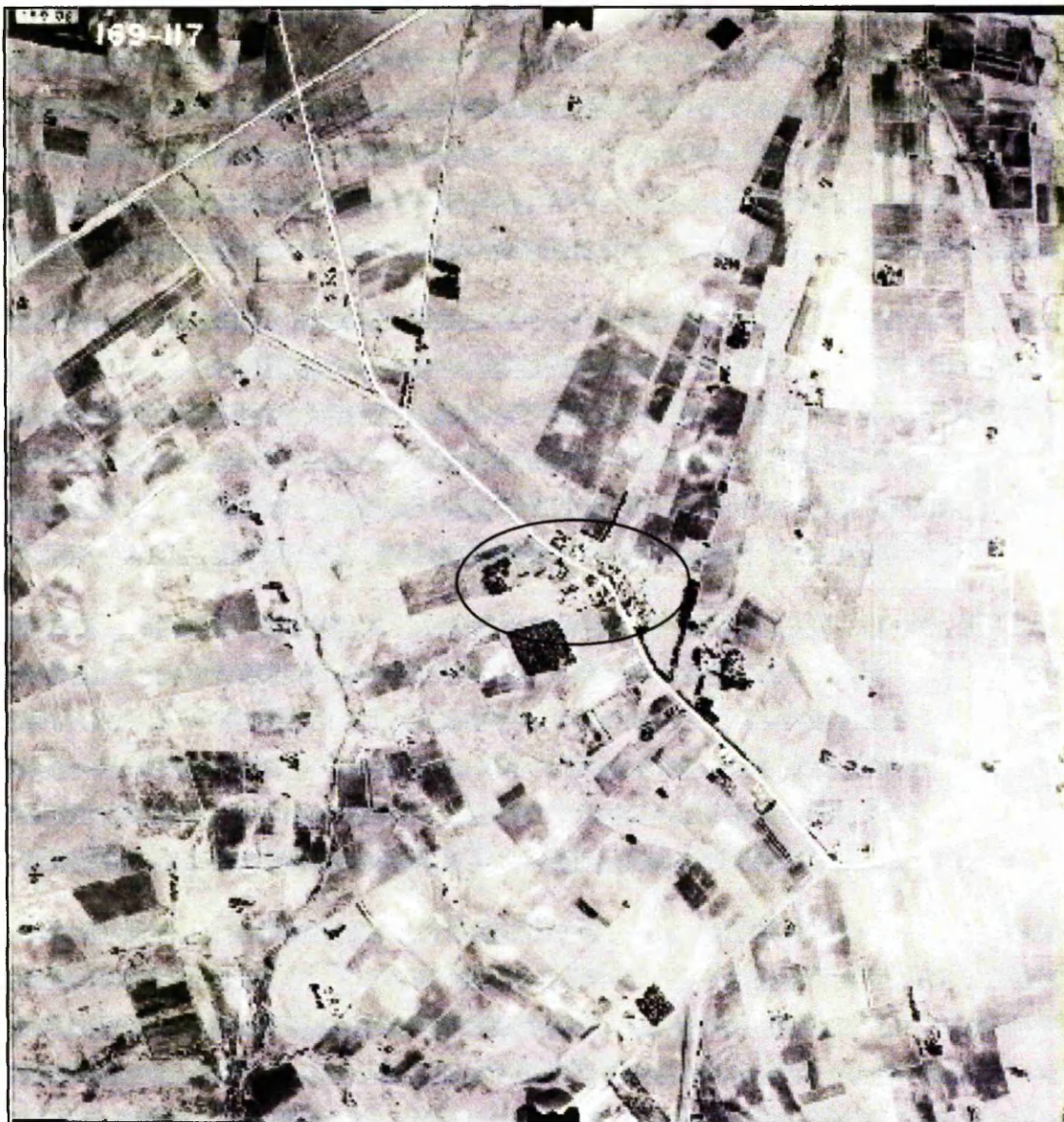


Figure 2. Aerial view of the village of Villa de Rosario and catchment area, ca. 1966.

Chapter 1. Introduction

Habitat and Settlement

This thesis draws upon fieldwork carried out from October 1997 until August 1998 primarily among dairy farmers who live in the upper part of the Santa Lucía river valley, in the southern region of the República Oriental del Uruguay (see figures 1 and 2, above). Uruguay was a former Spanish colony and became an independent republic in 1825. Its territory of 177,410 km² is inhabited by 3.16 million people, 91% of whom live in urban settings (INE 1997b). Fieldwork was conducted in the 13th district of the province of Lavalleja, a rural area inhabited by around a thousand people. The area under study centres on the ‘village’ of Villa del Rosario (150 inhabitants), officially denominated as a rural cluster [*caserío rural*] and located 26 kilometres to the west of the provincial capital, Minas, and 120 kilometres north-east of the country’s capital city, Montevideo. Across the provincial boundary to the south-west of the area of Villa del Rosario lie the northeastern districts of the neighbouring province of Canelones (from now on NEC) where many of the first families who settled came from. The 13th district is characterised by the presence of scattered small and medium holdings, sharing territory with larger cattle ranches. The scattered farms, villages and towns are connected through a network of relatively well maintained roads. These towns provide local markets for trade and agricultural services, official administration offices and, sometimes, job opportunities for commuters and temporary employees.

As mentioned, the area under study is part of the Santa Lucía basin. The landscape is made up of a fertile valley of rolling prairies to the north and west, surrounded by more

rocky and hilly terrain to the south and east. The area is cross-cut by several narrow dells and a few streams, which flow into the Santa Lucía river to the north and the Solís Grande stream to the south. The soils are said to be suitable for a mixture of agriculture and cattle raising, as well as industrial forestry (Cayssals and Alvarez 1984; OPP-OEA-BID 1992: 10).

According to Köpen's classification (Solari 1958: 245-6), the climate in the south of Uruguay is defined as temperate, mild and rainy. The weather is sub-tropical and semi-humid. There are four well differentiated but still variable seasons. The average rainfall is 1,000 mm [39.3 inches] per year, but can vary by as much as 25 percent from one year to the next. Moreover, there is a five-year cycle of floods and droughts. The average temperature is 17°C throughout the year, with moderate and humid winters. In July, the coldest month, the average temperature may rise to 11,5°C. The hottest month is January and the average temperature in summertime is 22°C. Over the autumn and winter, there can be 20 discontinuous days of frost, which pose a serious risk for unripe crops.

The history of the peopling of the area will be presented in detail in chapter 2. Here it is sufficient to make just a few remarks. First, the establishment of permanent human settlements in Uruguay in general, and in this area in particular, came relatively late in the history of the Americas. Moreover, despite the fact that the current provincial capital was founded in the late 18th century by the Spanish colonial authorities, the progressive peopling of the district where I conducted my fieldwork did not begin until the end of the 19th century, when Mediterranean European migrants and their descendants expanded the frontiers of arable farming as tenants of livestock ranchers.

Second, most migrants were poor peasant families who came from Spain and Italy where they had experienced the effects of rapid industrialisation. There are good reasons for thinking that the majority of these families came from the Canary Islands, though there is no academic agreement on this. This is why I adopted the name *Canarios*¹ to refer to the local family farmers I worked with. Having said that, my decision to give them this name was not intended to direct the reader's attention to their supposed national origins. Neither is it my intention to use this name to delimit conceptually a distinctive 'culture' or small-scale 'society', as was common in the classical anthropological literature. It is rather a short-hand to keep fresh throughout this thesis the particular environmental history of most of the rural producers I met in Villa del Rosario. Thirdly, this history, which is embedded in the landscape and embodied in peoples' performances, could be briefly summarised as having three stages: extensive crop-farming or the wheat cycle; extensive crop farming and intensive sugar-beet cultivation; and dairy farming. Moreover, despite a certain degree of overlap, each of these stages can be seen as correlating with the origins and further transformation of Uruguay as a capitalist social formation from the so-called first modernisation of the countryside that accompanied the development of European capitalism of the late 19th century (Barrán 1997: 15), to the current neo-liberal modernisation which is accompanied by social exclusion. The middle period was characterised by an economic model of import substitution and light industrialisation oriented to the internal market. Thus the subjects of this thesis and their remembered ancestors have never been 'people without history' (Wolf 1997 [1982]). On the

¹ In Uruguay, the noun *Canario* is used in its narrower sense to refer to those people who were born in the province of Canelones, who are supposed to be descendants of migrants from the Canary Islands. The term has been generalised to cover every small-scale arable farmer since arable farming had been practised on a wide scale in Canelones since colonial times. The use of the word *Canario* as an adjective has a relatively negative connotation when referring to

contrary, they have been actively involved in shaping their own history in relation to local, national, regional and international forces.

Previous ethnographic studies

Local literature

The southern region of Uruguay in general, and the province of Lavalleja in particular, has been very little studied by anthropologists and no ethnography exists among of the *Canarios*. The lack of anthropological studies can be attributed, among other reasons, to the recency of development of the discipline in the country. Vidart and Pi Hugarte (1969) pioneered the description of the 'human types' of the area. Their main concern was to identify the cultural legacy of Canary migrants with the building of the national community as expressed in customs and material culture, most of which were recorded from oral history, written sources and direct observation. However, there was a lack of systematic research into 'culture' as a context-dependent phenomenon, especially among arable farmers, as has been noted by Solari (1958).

In the 1980s, there was a boom in literature about the NEC, which in many aspects included the area of Villa del Rosario, though the latter is not part of this region as defined for administrative purposes. The economic and social crisis in small-scale farming since the mid 1970s turned this area into one of the main pockets of rural poverty in the country and, consequently, it received the attention of many social scientists. Most works were written by rural sociologists (Veiga 1982; Arbeletche et al.

somebody who comes from the countryside, and indicates a certain rusticity. But it can also be used in a more neutral sense and employed even with pride by the farmers themselves.

1983; Piñeiro 1984; 1985) and economists (CIESU/IPRU 1981; Cátedra de Economía Agrícola 1986; Sosa 1982; Stolovich 1989). These are macro-analyses of the situation of small farmers and family production in the NEC. They are useful for comparative purposes because they present information about the processes of migration, impoverishment and the organisation of civil society during the 1980s. Yet they only address the day-to-day life of local people tangentially.

In the early 1990s, the anthropologist Kirai de León (1990) introduced the topic of popular medicine through fragments of interviews with traditional healers, physicians and urban inhabitants. Her feminist perspective helped to give a voice to rural women. However, the most important precursor to my ethnography is the study made by a multi-disciplinary team of researchers, including myself, from the State University (Schiavo 1993). The study aimed to characterise the predominant productive systems in the catchment area of the Faculty of Veterinary Science's Experimental Centre (CEM) in the NEC district, and to discover obstacles and potentialities for future rural extensionism. Dairy farmers' practices were studied through interviews with technicians and community leaders, a survey among work-teams, and in-depth interviews with a sample of producers. The chapters written by anthropologists include an analysis of the demographic features of the area, a very brief economic and social history and a description of the division of labour on the farms, by age and sex. This provides a comprehensive baseline with which to compare the situation of dairy farmers in the late 1990s. However this study does not refer to the relations between society and the environment. Moreover, its theoretical argument is limited due to its objectives as a policy-oriented report.

Anthropologists have been involved since the first decades of this century in peasant studies worldwide, and particularly in Latin America, centring their debate on the reasons for the persistence of small farmers in a context of increasing capitalist and/or modern relations of production (Redfield 1941; Wolf 1966; Bernstein and Brass 1996-7). The discussion has varied between, on the one hand, the essentialist perspective on peasants' resistance to commodification, and, on the other hand, a historical perspective on the proletarianisation of the peasantry in the transition to capitalism. Later studies suggested a middle course between essentialism and proletarianisation (Friedmann 1978, 1980; Pappa 1992; Llambí 1988; de Janvry et. al. 1989; Gudeman and Rivera 1990). Nowadays, the category 'peasant' as a 'simple reproduction unit' (Llambí 1988 :354) has been somewhat marginalised in the literature, while capitalised small/family farms occupy the centre of the debate. The reason for this new interest lies in the new pattern of capital accumulation in Latin America, which shows a greater expansion of the contract-farm regime in rural areas along with increasing social polarisation and a reduction in the number of direct producers, though with significant differences between countries (Archetti 1983; Clapp 1988; Llambí 1990; Korovkin 1992)².

Not many studies adopt an ethnographic approach to dairy farmers in Latin America. Llambí (1988) presents a short case study covering dairy and beef-cattle producers in Perijá (north western Venezuela). It shows how their paternalistic relations with the State and agribusiness forced a particular technological choice and documents the new

² This concern with small farmers is not limited to Latin America. In Europe and the United States, there have been a number of significant recent contributions to the theoretical debate about the future of family farming in the context of deregulated markets (Alphandéry 1994; Blanc 1994; Davidson and Schwarzweller 1995; Djurfeldt 1996; Bernstein and Brass 1996-7).

situation they are experiencing as they face an expanded and deregulated market. Archetti (1975) presents a comparison between dairy farmers and crop farmers in central Argentina, explaining their different levels of participation in trade unionism. His description of the technical aspects of modern dairy farming was seminal for my own work (see chapter 3). More recently, Guadalupe Rodríguez Gómez wrote her Ph.D. dissertation on dairy farmers in Mexico. Regretfully, I have been unable to read her monograph and have to rely on just a personal communication (Rodríguez Gómez 1999). She writes about the resistance of Jalisco's dairy farmers to global conventions in the dairy industry. Her treatment of the contested cultural meaning of 'hygiene' highlights a central issue in modern dairying that was also very significant in my own research. Finally, the sociologist Quaranta (2000) describes the process of neo-liberal restructuring of the dairy sector in Argentina and the consequent heterogeneity of technological systems across farms, the organisation of labour and the quality of milk produced. Despite significant differences with the Uruguayan case, this study is useful for comparative purposes.

To summarise, the studies of technological change and environmental perception among dairy farmers are rare in the anthropological and sociological literature. This is my perception not only for Uruguay but also for Latin America as a whole. While I found only a very few empirical studies of Villa del Rosario (and those that I did find were only partial), the general literature on Latin America presents a more theoretical approach. From the latter, I could conclude that the study of the situation of small-scale family farmers is of increasing importance, with special reference to the incorporation of new technologies ('capitalisation'). On the other hand, the lack of recent anthropological research in Uruguay in general, and in Villa del Rosario in particular,

highlighted the importance of carrying out fieldwork among dairy farmers in this rural district. It is my hope to integrate theory with empirical research centred on the topic of nature-society interfaces from an anthropological perspective.

Conditions of fieldwork

My memories of the dairy industry go back to my childhood in the late 1960s, when my parents and schoolteachers used to feed me with fresh milk from an idiosyncratic greenish engraved glass bottle of '*Conaprole*', which has remained the major dairy co-operative in the country until the present day. When I grew older, I visited one of the dairy processing plants in the centre of Montevideo, as part of an education campaign of a kind that the company has continued to organise. Like most Uruguayans of my generation, I was delighted with the taste of the *Conaprole* ice cream we bought from street peddlers or at the beach. Moreover, as a member of a middle class family, I used to go with my family for a drink to one of the Co-op's milk bars in a posh neighbourhood a couple of times a year. Inevitably, when talking about milk and milk by-products in Uruguay, one has to refer to *Conaprole*.

For the following three decades, my relations with the dairy industry in Uruguay continued to be as a consumer, unconcerned about the whole process involved in the passage of milk from a cow to my table. It was in 1993 that I had the opportunity to examine dairy farming, the other side of the process of production in the dairy industry. That year, I participated in the afore-mentioned study conducted by the State Faculty of Veterinary Science. As part of my job, I visited a couple of selected households in Villa del Rosario to complete a two-hour questionnaire about household economics and other

related topics. The information collected was then used to propose new guidelines for the rural extension programme of the Faculty, especially the future use of the CEM (see above). When we finished our report in 1994, there was an Open Day at the Experimental Centre to present part of our conclusions to the farmers and technicians who were involved in the project. Afterwards, I lost contact with the countryside and became a lecturer in the Department of Social Anthropology at the State University. In September 1997, three years after my presentation in that open day, I went back to Villa del Rosario to commence fieldwork for this Ph.D. dissertation about dairy farming and dairy farmers. Besides my theoretical interests (see below), one of the strongest reasons for my wanting to do fieldwork among modern family dairy farmers in southern Uruguay was to look more deeply at their livelihoods and to contribute with an anthropological perspective to the existing sociological, economic and agronomic interpretations of social development in rural areas.

My permanent home during the period of fieldwork was in Montevideo, from where I travelled frequently to the area of Villa del Rosario where I stayed for between a couple of days to a month at a time. In Villa del Rosario I alternated between a borrowed house and my stays on local dairy farms. The reasons for spending a great part of my fieldwork time in Montevideo were both professional and family-related. In effect, my field research amounted to a kind of 'commuting ethnography'. This way of doing ethnographic research carried three distinct advantages. Firstly, throughout the history of Uruguay, Montevideo has been the main economic, administrative and political centre, leading to the location of the headquarters of many social and business organisations in the city. This is especially the case with the dairy agribusiness. Therefore, living in the capital city facilitated my conversations with relevant

informants like union leaders, rural extensionists, university scholars and specialised journalists. Secondly, most public and private libraries and archives are located in Montevideo. Due to the lack of previous ethnographic studies, I allocated a great amount of time to collecting relevant secondary data and documents that were scattered around the city, a task that required several visits to institutions throughout the period of fieldwork. Thirdly, most of the owners of non-family dairy farms in Villa del Rosario live in the capital city. Although my prime object of study was the livelihood of family farmers, I found it necessary to listen to these entrepreneurs and to ask them for permission to visit their farms. It was easier to arrange appointments to interview them whilst in the city. Last but not least, I should mention that my situation as a dweller in the capital city helped me to establish particular relations with local farmers, and thus to discover from a different perspective their practical problems and ways to constitute their sociality. Somehow, in return for being my 'informants', local people asked me to be theirs and, moreover, to help them with practical matters thanks to my part-time residence in Montevideo. For instance, once I was asked to find the educational curricula of the university course in Social Work for a farmer's daughter who, next year, would have had to decide where to pursue her higher education. Similarly, the parents of a deaf teenager expressed their worries about the social isolation of their son. Due to my previous research experience within the organised deaf community in Montevideo, I offered to bring them some articles and information about its activities, as well as a manual of the Uruguayan sign language, so that they would know that other people were actually reflecting on and intervening in this field. Needless to say in both cases, people greatly acknowledged my interest and the received information, which in turn, I feel, helped me to build up a more symmetrical personal relation between local farmers and myself as a social researcher. The same could be said in the case of a dairy

family who put me up on their farm for a couple of weeks. A fairly new water boiler did not work when they tried to install it. Thus, they accepted my offer to take it to the factory for repair on my next trip to the capital. From the above examples, it seems plain that many people benefited from my social networks and knowledge, as I did from theirs in order to collect the information I use in this thesis.

It should be stressed that my attempts to build good rapport with the local community were relatively successful right from the beginning, thanks to the supportive action of Roberto, a local veterinarian, university extensionist and teacher at Villa del Rosario's secondary school. He has become a cherished community leader due to his longstanding commitment to work together with each and every household in the area. I was introduced to him by the head of the Department of Rural Extensionism of the Faculty of Veterinary Science. Although I am sure he is still wondering about the aims and, mainly, the 'real' applications of my research, he opened his heart to my work. From my first visit to the area, when I participated in a meeting of a local group of pig producers, Roberto introduced me to all his acquaintances as "the anthropologist". A couple of times during this first stage of my fieldwork, he invited me to visit farms on his daily journeys. Each of these visits became a first-hand lesson in the technical and social realities of family and non-family rural enterprises, and undoubtedly helped me to start building my contacts in the community. Furthermore at that time, Roberto had just been employed as the veterinarian of the Villa del Rosario dairy farmers' work team (7 members), in whose regular meetings I participated for over a year. Therefore, he acted as a direct 'key' to one of the main groups of people with whom I worked, and whose life histories and current practices constitute a major part of this dissertation. Moreover, it was thanks to Roberto's kind mediation that I was able to contact Juan, the

former work-team vet and a current cattle producer in the area, who unconditionally offered me his seldom occupied house on the little-known 'Republic of Trikalanga' farm. For most of the time, I was alone in the house, where indeed I just spent my evenings writing notes by candle light, or had an austere dinner before going to sleep after a busy day of informal chats, participation in agricultural tasks, and more formal interviews, the latter especially with elderly people. Significantly, a couple of immediate neighbours, as well as other farmers, always insisted on my staying at their place instead of riding my bicycle back to Trikalanga, where, in their opinion, the living conditions were far from ideal, especially due to the lack of electricity and of a well-maintained entrance to the farm. Indeed, I believe they were more concerned about my sense of loneliness than the lack of material infrastructure. In particular, they seemed to be sorry that I was far from my wife and son, who remained in Montevideo. This was true on a few occasions, but in general I felt happy to be on my own, at least for a couple of hours every evening, to disengage from the flow of active participant observation. On the other hand, I should mention the unforgettable conversations with Juan while sharing a bottle of wine after putting his three children to bed, on the few occasions when our stays on the farm coincided.

As mentioned, my work with a team of dairy farmers became the methodological core of my research. I introduced myself as a university lecturer and postgraduate student who was trained to write about their ways of working and living. I further explained to them the aims of my research and asked them for permission to participate in their regular activities. I suggested that the results obtained might help to provide a better understanding of their realities, and perhaps improve the work of extensionists and other local agents. (Indeed, this was my response to other people who wanted to know

what my project was 'for', apart from simply satisfying my private desire to obtain a Ph.D.). The dairy farmers of the Villa del Rosario's work-team agreed unconditionally to my proposal and most of them invited me to stay at their farms if necessary. I received the same response from several other individual family farmers whom I began to meet after that first encounter. Consequently, my ethnographic analysis is not only guided by academic considerations, but also it has been one of my conscious goals to respond in a modest way to this assumed commitment to add a different perspective to people's own perceptions of their reality. Should they take it as one among the other available intellectual tools to use in reshaping the world of their experience, my expectations will be fulfilled.

Research strategy

Local people were not actually surprised that a university scholar should want to conduct some fieldwork amongst them. What was somehow strange from their point of view was my lack of any background in the agricultural sciences. Moreover, people were a little confused at the beginning that, along with questions on the economy of a farm, the use of crops, animal herding, and farming technologies, I also showed a particular interest in local history, old and new customs, the daily practices of all family members and the village's workers, the activities of local organisations not directly related with agricultural production, and so forth. The fact is that many farmers had already hosted advanced students or *pasantes* from both the Faculty of Agronomy and the Agricultural Technical Colleges (*Escuelas Agrarias, Universidad del Trabajo del Uruguay*) to conduct fieldwork leading to their BA dissertations. Also, the number of teams of rural extensionists in the area has significantly increased over the last two

decades. Therefore, most local people are used not only to receiving technicians and students on their farms, but also to providing information for surveys that focus mainly on the economic and technical features of their rural enterprises. However, the narrowness of previous approaches to peoples' experiences, both in their objectives and forms, emerged as a constraint for my purposes. People were accustomed to a questionnaire-type interaction: "hello, question, answer, good bye, good luck". I am not denying that this kind of enquiry has some utility. Yet, for my research purposes and planned methodology, I had to struggle against such an impersonal approach. To deal with this problem, I developed a fieldwork strategy that took precedent into account and aimed to overcome its limitations. Thus, after my introduction to the dairy work-team and a couple of journeys accompanying Roberto to make myself more 'visible' in the community, I prepared a semi-structured questionnaire (see appendix A). The questionnaire was evaluated regarding its form and content before I used it to collect more 'objective' data from the dairy farmers. The result is a survey of 24 dairy farms that has little statistical validity, but that incorporates examples of three kinds of dairy farms: family farms associated with the dairy agribusiness (14); non-family or 'capitalist' farms associated with the dairy agribusiness (5); and family farms that sell their fresh milk to local intermediaries or to a local cheese dairy (5). The methodology underlying the distinction between family and non-family farms followed the common principle applied in the national agricultural census (Dirección de Censos y Encuestas 1994), which discriminates between kinship-based and waged-based organisations of labour on the farms. The list of dairy farmers that I expected to survey was made, with the assistance of Roberto, on the premise that dairying should be, in principle, the basic source of income of the farm. Moreover, the farm's geographical location should be in the catchment area of the village of Villa del Rosario, defined *a priori* as not beyond a

radius of 10 km from the village, a distance reachable in a day by bicycle, which became my main means of transport within the district.

The use of a relatively structured research tool helped to fulfil peoples' expectations of what a fieldworker ought to do. In subsequent visits to the farms, I was able to participate with them in less structured situations, though I always had to cope with the typical attitude among farmers (mainly men), which was to stop their current task, if possible, and invite the guest to sit down in the house or under the shade of a tree to start a conversation. To avoid this situation, which frustrated my purpose of observing people in their working settings (in spite of my attempts to explain that it was important for me to accompany them while actively engaged in working practices), I soon realised that the best moment to visit a dairy farm was just before the milking routine began. This is how I made my first round of visits to the 24 selected dairy farms.

A second stage of my field research was to select particular dairy farms to live and work on. Two family farms and two non-family farms that submitted their product to the Co-op were chosen for the more direct observation of daily life. In these cases, I was able to engage in different agricultural tasks, but mainly milking. This first-hand working experience provided a great deal of the information that I have used to support my thesis. It might be problematic to extrapolate from personal experience to other people's processes of enskillment. However, as Corn (1996: 44) has suggested, 'artefactual apprenticeship' helps to develop a better informed analysis of techniques and skills than does a fully detached approach. It is important, Corn argues, to recognise the value of the 'experiential, the ordinary, and the personally particularised', alongside the theorised and abstract perspective on socio-technological systems. Indeed, the

objectivist approach to the study of such systems has led to the paradox that ‘even in an object-centred speciality like the history [and anthropology] of technology, being “objective” [...] may require suppressing experience with actual objects’ (Corn 1996: 47). Furthermore, if we are interested in the study of expertise, knowledge and skills, for instance, in the use of milking machines or cattle management, we must acknowledge the difficulties that people experience in putting into words much of the tacit knowledge that they have built up through experience (see Dreyfus and Dreyfus 1987: 28). Therefore, by putting his hands to work, a participant observer might start to share the perceptions of the environment of the people he is working with. Though I did not have the same social and cultural background as local farmers did, I believe that some analogies can be presented between my own experience of learning-by-doing and that of adult dairy farmers. To sum up, my choice of an ‘artefactual apprenticeship’ methodology of fieldwork was based on the expectation that it could throw light on some basic perceptual processes embodied by *Canarios* dairy farmers in their attempts to cope with machines, plants, animals and people in practical settings.

The questions

This dissertation focuses on the processes of mutual constitution of the natural environment and society based on the study of the rural livelihoods of family dairy farmers in southern Uruguay. Family farmers seem to be in a middle position in terms of the discussion of nature-society relations. On the one hand, they are ‘modern’. Therefore they should be alienated from nature. On the other hand, they are farmers who engage daily with the rhythms of the growth of plants and animals, the seasons and the local weather. Therefore, they should not be so alienated as urban dwellers are supposed to be. Consequently, it seems important to know how modern farmers really

experience their environment. The issues to be addressed in this thesis revolve around the place of modern technologies in the unfolding of environmental affordances, the interrelations between technology and social reproduction, and the consequent emergence of different cultural evaluations of the environment among rural dwellers. The questions on which I focus include the following. How do *Canarios* dairy farmers relate to the natural environment? What kinds of relationships do we find between their practices and attitudes towards non-human constituents of the environment and the constitution of social relations? Do dairy farmers conceive of nature as something external, and perhaps antagonistic to society? Can different ways of objectifying the natural environment be discovered among rural agents? Does the use of modern agricultural technologies imply an instrumentalist attitude towards environmental resources? What are the links, if any, between the engagement within the environment and the integration of modern farmers within a particular institutional network? These kinds of questions, I believe, are not only pertinent to a study of nature-society relations; they also stand at the core of the traditional definition of the anthropological project. This project has divided recent human experience into Western and non-Western cultural forms, based largely on the criterion of people's relations with, and conceptualisations of, nature. The aim of this thesis is not only to describe the experience of *Canarios* farmers ethnographically, but also to use this description to qualify, contest or confirm mainstream anthropological ideas in ecological and economic anthropology about the possible disembeddedness of the non-human environment from society, in the context of the increasing decontextualisation of production (see Hornborg 1996: 51).

Theoretical outline

In a recent and insightful review, Peter Brosius (1999: 278) pointed out that the last decades have witnessed the emergence of so-called 'environmental anthropology', a field of enquiry concerned, mainly, with the politics of representation and contested discourses about the natural environment. Environmental anthropology seems to have been an academic response to the conspicuous activism of environmental social movements world-wide and their challenge to mainstream anthropological ideas and methods. Brosius stresses the thematic and epistemological gap between this sub-discipline and the older ecological anthropology of the 1960-70s, represented for instance by the classic works of Richard Lee on the Kung! of the Kalahari Desert or Roy Rappaport's study of the Tsembaga-Maring of Papua New-Guinea. This earlier ecological anthropology, according to Brosius, was characterised by

[...] a persistent interest in localized adaptation to specific ecosystems and by an abiding scientism: to the extent that cultural or ideational factors enter into analyses of this sort, they are viewed primarily with respect to their adaptive significance. (1999: 278)

On the other hand, a post-structuralist inspired environmental anthropology would be more alert, Brosius suggests,

[...] to issues of power and inequality, to the contingency of cultural and historical formations, to the significance of regimes of knowledge production, and to the importance of the acceleration of translocal processes. (ibid.)

Brosius's advocacy of this latter perspective expresses one of the most important trends in the anthropological study of nature-society relations in the 1980s and 90s, namely, a prominent concern with the recording and analysis of peoples' discourses *on* the environment, rather than the systematic observation and explanation of the daily material practices of people *within* their environment. However, as many of the commentators on Brosius's article correctly pointed out (e.g. Escobar 1999; Hornborg

1999), there are other current theoretical attempts to overcome the flaws in the old ecological anthropology (e.g., its assumption of a given and fixed ecosystem as the background for the adaptation of cultural institutions) which do not have resort to a radical cultural constructionism of nature (Descola and Pálsson 1996a: 11). These attempts, as shown for instance in compilations such as those edited by Croll and Parkin (1992), Descola and Pálsson (1996b) and Ellen and Fukui (1996), are oriented towards the study of the relations between the transformation of the material world, social relationships and how people represent their experiences in verbal accounts and by other means (e.g., maps), and conversely, how the hegemony of certain ideologies, discourses and folk classificatory models of the natural environment might effect the way people relate materially with non-human components of the environment. My own theoretical approach stands closer to this latter 'new' ecological anthropology than to environmental anthropology. Consequently, in terms of research methodology my theoretical questions require a combination of detailed ethnographic description of the practical engagement of local people with the natural environment, *and* attention to the 'words' they enact as tools for both the transforming and representing their surroundings. This is a non-representational approach in which linguistic expressions (such as metaphors) are seen as thought-in-action (Thrift 1996: 7) rather than creations detached from the world. All of these relations are seen as part of an evolving social context (Guyer 1988; Croll and Parkin 1992; Knight 1996; Stine and Tarr 1998). In short, this thesis attempts to show that modern rural producers do not work, think and communicate with each other outside of the world, but rather that it is in the particular ways in which they engage practically with both the human and non-human components of the world that we find the reasons why some portions of it are objectified, and sometimes even reified and fetishised, in their commonly ambivalent discourses. This

discussion leads me to one of the main conceptual issues in anthropological theory, namely, the idea that we can classify particular social structures according to the relative independence of their constituent realms, for example of economic as against kinship or power relations.

Embeddedness

One of the most significant contributions of social anthropology to social theory has been the concept of the embedded nature of social phenomena. This concept was developed by the substantivist school in economic anthropology, represented by Karl Polanyi (1971) and his followers, in their attack on the formalist school's claim that concepts and categories provided by the neo-classical model in economics may be applied to explain pre-market 'economies' (Narotsky 1997). Indeed, according to the founder of the substantivist school, embeddedness is a characteristic not only of pre-market societies, but also of the capitalist mode of production. The difference, however, is that, in the latter, 'instead of economy being embedded in social relations, social relations are embedded in the economic system' (Polanyi 1971: 57). In fact, as Narotsky (1997: 49) pointed out, the disembeddedness of the economy in capitalism is more apparent than real. This line of thought, that sees different kinds of societies according to the degree of detachment of social subsystems, was the legacy of a long tradition in the critique of 'modernity' including, among others, the classic works of Marx, Weber, Simmel and Mauss (for recent reviews of these authors' contributions to anthropology, see Hornborg 1996; Hutchinson 1996; Carrier 1992).

In current debates in ecological anthropology, the embeddedness/disembeddedness of 'economy' has been replaced by the same question about 'nature'. Consequently, there has been a revision of the ethnocentric use of the concept of nature as understood in Western societies to explain the kind of relatedness of traditional (and even non-traditional) people to their environments. As Ellen has pointed out:

The nature-culture distinction is constituted in different ways in different theoretical approaches in ecological anthropology, bridging three levels of analysis: one in which the environment is a biological given, one in which it is bifurcated (analytic and folk), and one in which all senses of nature or environment are 'constructed' and negotiable. *What is distinctive about recent work in cultural anthropology, ecological anthropology and sociobiology is that what we might mean by nature has again become a central issue, for modernists and postmodernists alike.* (1996a: 19; emphasis added)

Hornborg (1996: 46) is explicit about the connections between the debate in economic anthropology during the 1950s and 1960s and the development of ecological anthropology from the 1970s onwards. He argues that today's discussion of human ecology and sustainable livelihoods opposes 'modernists' and 'contextualists', who respectively resemble the formalists and substantivists of the earlier debate. While a contextualist 'denies the capacity of abstract, totalising systems such as science or the market to solve the basic problems of human survival', modernist thought represents the "disembedding" tendencies in modernity' (1996: 45). Talking about the effects of the modernist perspective on natural resource management, Hornborg writes,

Decontextualised models, such as the universal rationality of the 'Green Revolution' or the formalism of neo-classical economic theory, alter the relationship between the person and the world by subordinating or eclipsing the non-objectifiable, local specificities which render meanings everywhere so implicit and inextricable. (1996: 53)

On the other hand, the contextualist position relies on the belief that

Because of the sheer complexity and specificity of eco-systemic interrelationships and fluctuations, it is not unreasonable to expect that optimal strategies for sustainable resource management are generally best defined by

local practitioners with close and long-term experience of these specificities, and with special stakes in the outcome. (ibid. :54)

In short, if in pre-market societies, the economy is embedded in a total or partial web of social relations, the same seems to be true for the relations between people and non-human components of the environment, which are also embedded in people's sociality and local practices. On the other hand, modern societies have experienced not only the disembedding of economic life but also the detachment of something that came to be known as 'nature' from local contexts and specificities.

In the case of technology, we can find the same argument and distinction between societies, or to be more precise, between different perspectives on a particular society. For instance, Ingold (1997: 107) points out that most anthropologists have seen technology as 'an objective system of relations which lies outside the realm of the social', and the technological differences between primitive and modern societies as a matter of simplicity or complexity. He stresses that this externality of technology from society is a product of history:

It has emerged in the West, in the last few centuries, hand in hand with what could be called a 'machine-theoretical' cosmology. We cannot, I think, retroject into history the modern separation of society and technology, or extend it indifferently to humanity at large, without seriously distorting our understanding. My thesis, in a nutshell, is that in the societies we study [*sic*]—perhaps even including our own—technical relations are embedded in social relations, and can only be understood within this relational matrix, as one aspect of human sociality. (Ingold 1997: 107)

And he adds,

Over the last two or three decades anthropologists have been at pains to show how 'economy' and 'society' became institutionally separated in the history of Western capitalism, how the category of the economic is itself a product of this history, how in pre-capitalist societies economic relations are embedded in social relations, and how—with the development of market-oriented capitalism—economic life was progressively disembedded from social life [...].

All that I am doing is to extend the same kind of argument to the concept of technology. (ibid. : 108)

I take this process of evolving disembeddedness as an operational hypothesis. However, instead of tracing a process of disengagement affecting each realm of reality, for instance economy, nature or technology, I try to figure out the interrelations between economy, technology and nature and moreover, how people perceive their interconnections or disconnections as part of the same developmental system. The underlying historical process that connects these three aspects of people's livelihoods is the modernisation of production and general life. In other words, we can hypothesise that the modernisation of human societies has meant the estrangement of economy, nature, and technology from other social relations. At this stage, it is necessary to clarify the meaning of the term 'modernisation'.

Modernisation

I adopt Brey's definition of modernisation, which is as follows:

the characteristic form that development takes in modern times. It is the process of development that finds its starting point at the industrial revolution, and is characterized by increasing productivity and technological complexity, centralization, rationalization of production, the employment of scientific principle and method, and professionalization. (1999: 156)

The philosophical background of modernisation lies in the 'principle of autonomy',

The idea that individuals and societies can attain self-determination or self-rule, and can define their own laws of operation independently from their environment. [...] The project of modernization can be understood as a modernist project aimed at increasing the autonomy of its beneficiaries, by granting them, through technology, increased control over their own destiny, by giving them extended powers to realize their goals and satisfy their desires, as well as giving them increased protection and insurance against harm and adversity. (ibid.: 156-7)

Yet, the historical process of modernisation has been marked by profound contradictions, as reflected in the continual degradation of the lives of the majority of human beings in the world, hand in hand with the degradation of their habitats. As Huber and Pederson (1997) point out,

Industrialism, extended commodity production, nation-states and increasing application of science are important features of modernity. The movement from pre-modernity to modernity should not be understood in terms of evolutionary stages but as *the uneven historical transformation of the world over the last several centuries*. (1997: 578; emphasis added)

I would like to introduce here the difficult, though important, concept of alienation, which might help to link environment, technology, social differentiation and the modernisation process in agriculture. In social anthropology, the concept of alienation has been widely used, though with different and sometimes contradictory meanings.

Alienation

As with all concepts, the meaning of the concept of alienation varies according to the context of use. Williams (1988: 33-36) has brilliantly reviewed the changing meanings of this term in the history of social theory. My first step in defining the term draws on the ideas of Marx, summed up by Williams as follows:

Man makes his own nature, as opposed to concepts of an original human nature. But he makes his own nature by a process of objectification. [This process of objectification] is seen as the history of labour, in which man creates himself by creating his world, but in class-society is alienated from this essential nature by specific forms of alienation in the division of labour, private property and the capitalist mode of production in which the worker loses both the product of his labour and his sense of his own productive activity, following the expropriation of both by capital. (Williams 1988: 34-5)

According to this classical definition of human alienation, it takes two overlapping forms. On the one hand, human beings relate to the material world by transforming it and, in the results of this labour process, different components of the material world and particular relations between them become practically, and sometimes explicitly (through language), distinguishable from their background. On the other hand, the material results of the labour process might also objectify the skills of the labourer, who becomes aware through them of his own human nature or embodied skills (Marx 1979: 283). Thus, though the results of human action might become independent from their producers, they are eventually reappropriated (Grundmann 1991: 108). However, this general law of development is inflected in different ways through history. The specific forms of objectification depend not only on the practical engagement of a person with the non-human environment, but are also informed by the kinds of relations that obtain between people. Four significant themes in social anthropology revolve around these relations between the practical transformation of the material world, social relations and the alienation of nature from social life: technological alienation; property relations; the estrangement between people in working practices; and the fragmentation of knowledge due to the social division of labour. In the following sections, I shall review these issues in order to arrive at an operational definition of alienation.

Technological alienation

There has been in Marxism a long, and sometimes misleading, debate about the causes of social change. For some authors, technological development is autonomous and leads to changes in both in the infrastructure and the superstructure of socio-economic formations. For others, the rise of new social relations of production might influence

changes in the forces of production and thence the rest of a particular social formation. In this debate, the relations between the use of industrial technologies and their effects upon the subjectivity of workers and their relations to their inner and external natures have always been of key concern (see Grundmann 1991: 108). According to Grundmann (1991: 162 and *passim*), Marx was very ambiguous in his writings about the alienating effects of modern technologies upon the worker's subjectivity, though he seems to have ended up by putting most weight on the negative effects of the capitalist use of modern technology, i.e. machine-centred industry, rather than on any universal properties of machines and technological systems *per se*.

A similar emphasis on the social relations of production as against autonomous technological evolution has also been defended in much recent anthropological work (e.g. Guyer 1988; Pfaffenberger 1992; Hornborg 1992). For instance, Guyer writes,

Technologies are necessarily social and political in that they entail [...] forms of organization and domination [...] and are necessarily imbued with cultural meanings through symbolic associations. (1988: 254)

In the same line of argument, Pfaffenberger points out,

Technology is essentially social, not technical. When one examines the 'impact' of a technology on society, therefore, one is obliged to examine the impact of the technology's embedded social behaviours and meanings. (1988: 241)

In a more recent article, Pfaffenberger further advances his argument against the technological determinism that pervades what he calls the 'standard view of technology' (1992: 494). One of the misleading assumptions held by this standard view of technology, he maintains, is the belief that the way to describe the development of the material means to transform nature through human history is by positing a 'unilinear

progression from simple tools to complex machines' (ibid.: 507). Concentrating on the analysis of 'sociotechnical systems', defined as 'complex heterogeneous linkage of knowledge, ritual, artefacts, techniques, and activity' (ibid.: 509) oriented towards the production of material things, Pfaffenberger argues that there is no essential 'rupture' between pre-industrial and industrial sociotechnical systems. In his words:

According to the Standard view, tool use is authentic and fosters autonomy, one owns and control one's own tools and isn't dependent on or exploited by others. When we use machines, in contrast, we must work at rhythms not of our own making, and we become ensnared in the supralocal relations necessary for their production, distribution, and maintenance. To the extent that we become dependent on machines we do not own, the stage is set for exploitation. *We become divorced from nature, and our conceptions of the world become pathological, through a process called reification* (a malady frequently asserted to occur only in industrial societies). (Pfaffenberger 1992: 509; emphasis altered)

He refutes this standard view as follows,

Although one would be foolish to deny the significant consequences of the machine's rise, preindustrial sociotechnical systems were themselves complex and exploitative [...] A preindustrial sociotechnical system unifies material, ritual, and social resources in a comprehensive strategy for societal reproduction. In the course of participation in such a system, many if not most individuals find themselves playing dependent and exploited roles. By no means is reification restricted to industrial technology. (Pfaffenberger 1992: 509)

Two things must be noted from the passages reproduced above. First, Pfaffenberger seems to contest the theory of embeddedness/disembeddedness, which might be identified with what he calls the 'doctrine of rupture' between pre-industrial (Tool Age) and industrial (Machine Age) sociotechnical systems (1992: 510). Nevertheless, he clearly acknowledges that significant changes might have occurred in modern industrialised sociotechnical systems in comparison to other kinds of systems, though he thinks that they have been exaggerated in academic writing (cf. Ingold 1988b).

Second, Pfaffenberger does not dispute the alienating effects of industrial technologies as described by the standard view, though he argues that reification³ is not exclusive to industrial societies and that pre-industrial sociotechnical systems might give rise to alienation as well.

Undoubtedly, Pfaffenberger is more concerned with the production and use of technologies in pre-industrial societies. However, he also gives some ethnographic examples of how 'de-contextualised' industrial technologies are resignified by local users (Pfaffenberger 1992: 511). He proposes that in the context of either pre-industrial or industrial societies, an assessment of the social and cultural impacts of technological change calls for 'a fully contextual study in which people are shown to be the active appropriators, rather than the passive victims, of transferred technology' (ibid.: 512).

In this thesis, I use the concept of sociotechnical systems because it might help us to recognise interfaces between social relations and the materiality of technologies. Contrary to certain views that regard technology as a fully arbitrary social construct (see Grundmann 1991: 148, for a discussion), the concept of sociotechnical system takes into account the potentialities and constraints for human agency of the material configurations of machines, tools, working environment and practical knowledge, while

³ Pfaffenberger's use of the term reification is not very clear. He seems to use it to express the process of alienated objectification as described above, when he states that 'according to the doctrine of Rupture, reification occurs because we employ objects as a means of knowing ourselves. When these objects are no longer our own authentic products, as in the case of industrially produced artefacts, our attention is deflected from critical self-awareness to the incompletely understood Other who generates the artefact' (Pfaffenberger 1992: 509). As Williams (1988: 35) points out, there are problems of translation from the original German words to English that might lead to confusion. To avoid these problems, in this thesis I shall use Grundmann's (1991) definitions of reification, fetishism and alienation, as he interpreted them from Marx's *Grundrisse*. Reification means that 'a social relation takes the shape of a thing'; fetishism is enacted when 'this thing is invested with a power of its own', and alienation is in

at the same time it does not deny the effects of social negotiation upon technological change and continuity. Yet, I need to make two qualifications to Pfaffenberger's presentation. Firstly, I do not take for granted the alienating nature of industrial sociotechnical systems, as he seems to do despite his emphasis on people's agency in changing and shaping embedded social behaviours and meanings. Secondly, sociotechnical systems might change in industrial contexts. It is my aim to show that a historical account of technological change is needed to understand the relations between people's practices, power relations, machines, the natural environment and peoples' perception and expressions of all these complex connections. Moreover, the study of the evolution of socio-technical systems is intimately related to the establishment of property relations over the means of production and the products of people's labour.

Alienation and property relations

Netting (1993) is one of the few anthropologists who has directly addressed the topic of alienation among small-scale farmers, as part of his defence of smallholding and individual family farming as against large-scale agricultural enterprises, both in capitalist and former socialist countries. He agrees with Marx that people 'make their own lives in their productive activity' (Netting 1993: 328) and that both a wage labourer and an independent farmer might be 'estranged from their true natures when they are alienated from the products of their labor and the act of production' (ibid.: 328-9). However, he points out that smallholders represent a 'bastion of resistance to the alienation of employment' (ibid.: 329) in a capitalist society. His argument is based on the following observations, that appear to hold cross-culturally:

place when 'this power reacts upon the individuals as an independent force' (1991: 163). Hence,

- a) Farm work may be arduous and time-consuming, but unlike factory work, it cannot be characterised by 'routinization, specialization, and submission to external control and direction' (Preston, quoted in Netting 1993: 329).
- b) The voluntary character of smallholders' work. (Netting 1993: 329)

Netting argues that the above features of smallholding, than enable it to resist alienation in productive activities, rest on two basic premises. The first is the disappearance of all mechanisms that might alienate the product of farmers labour, namely 'confiscatory rents, taxes, labor services, terms of trade or appropriation of the means of production' (1993: 329). The second is that farmers need a context where the alienability of land or, as he put it, 'the right to convey or transfer property freely' (ibid.: 329), is politically guaranteed. He sums up the relations between property and the quality of farm work as follows:

The possession of established private and common property rights in the market economy of productive smallholdings is a protection, though not a perfect one, against alienated, subservient, and degraded work. (1993: 329)

Moreover, while defending farm work as against urban manufacturing as a solution to unemployment in Third World countries, Netting also adds that:

When labor and property rights are combined, and when the farm household organizes and schedules its own skilled activities as an independent enterprise, the relations of production are not those of alienation. (1993: 331)

Finally, and more importantly for the purposes of this thesis, Netting suggests that, besides the absence of alienation in acts of production and in the appropriation of the products of their work, smallholders and family farmers show a spirit of sustainable

developmental towards the natural environment, strongly related to inter-household co-operation and inter-generational succession. In his words,

The social ties and sentiments that bind household members to each other and to neighbours with whom they share work, tools, churches, and schools also have an explicitly temporal dimension. Smallholders cannot wittingly destroy their own resources and thereby ruin the future livelihoods of their offspring. Choices of farming practices that involve soil mining that causes run-off erosion, declining nutrient status that necessitates higher fertilizer application, increasing pesticide and herbicide use with declining effectiveness, and the pumping down of groundwater supplies contradict obvious good farming practice and leave an impaired inheritance for the next generation. (1993: 333)

It seems, then, that so long as certain general conditions are in place (e.g., the commodification of land and the independence of farms as units of production), smallholders need feel alienated neither from their natural environment nor from their work. Although Netting's view could be criticised as based on an ideal, and possibly Utopian, liberal free-market capitalism instead of the 'real capitalism' that most people in this world are experiencing, I shall take from his work some of the topics that a study of the relations between technology and alienation from the environment among family dairy farmers should address. These are:

- i) the material characteristics of work, people's skills and the rhythms and schedules of work;
- ii) the organisation of labour in the household and between households;
- iii) cycles of household development;
- iv) property regimes and control of the means of production;
- v) the institutional relations between farmers and other economic and political agents;
- vi) the meanings of farm work for family farmers and other agents; and
- vii) people's attitudes towards the natural environment.

In another important article, Carrier (1992) applies the Maussian distinction between gift (personal) and commodity (impersonal) relations in order to outline the 'growth of alienation in production' through the history of capitalism in the Western world, from cottage industry to modern industry. He defined alienation as the 'separation' of a person from things and other persons. In his words:

A thing is alienated from a person when it is seen as separate from that person; a person is alienated when seen as separate from surrounding people or things. Thus, *alienation refers to how people perceive and understand themselves and their environs.* (Carrier 1992: 540; emphasis added)

Hence, the study of peoples' alienation from their natural environment might require one not only to know how they relate to, and conceive of, the material world that surrounds them, but also to describe the relations between people and how they see themselves. Moreover, in an endnote Carrier adds:

'Separation' has the corollary that the thing or person alienated from oneself is perceived as having an independent basis of existence. (1992, endnote 3: 554)

The relation of alienation means the constitution of at least two independent domains that might interact but nevertheless have their own autonomous evolution. Carrier's conclusion is that, in modern industrial societies, social life is divided into two spheres. On the one hand, there is 'work': an impersonal space where people are estranged, alienated from other workers and things, though people might counteract this trend by means of tacit or explicit resistance (see e.g. Noble 1986; MacKenzie 1984). On the other hand, there is 'home', defined as a more personal and familiar sphere of activities where the identity of people relies on intersubjective exchanges and the performance of

personal skills. (See Ingold (1995) for a critique of this dualism between work and home.) In my present study, as I shall show when describing the attitudes of *Canarios* farmers towards time in chapter 5, this distinction between work and home cannot be so clearly made and may indeed obscure much of the specificity of the current lifeworlds of household producers. Nevertheless, it seems to me important to bear in mind the possibility that alienated and non-alienated relations between people and their 'environs', might co-exist, even in a contradictory way, in a particular time and place. As Carrier pointed out in his concluding remarks,

There is greater differentiation of social life; but also [I] suggest that this differentiation means that people are increasingly likely to be *confronted with the task of negotiating the boundary* between the two realms, respectively personal and impersonal. (1992: 553; emphasis added)

Alienation of knowledge

More recently, the environmental sociologist Peter Dickens (1996) has attempted to link social organisation and people's alienation from the natural environment. He draws upon the central Marxist idea of alienation under capitalism, resulting in detachment from both human nature (as historically constituted) and the external world. However, instead of stressing the private appropriation of the product of labour from the direct producer as the fundamental source of alienation in modern societies, Dickens finds a more general and universal reason for alienation: the division of labour in human societies and the corresponding fragmentation of knowledge of the material world and of humans themselves. Thus, according to Dickens, alienation is

The process by which people's understanding of themselves and their relationships to the world are removed. [...] The result is a profound failure to understand our own circumstances. (Dickens 1996: 58)

He adds,

The resulting paradox is that on the one hand humans are the one species which has managed to create the world largely in its own image. And yet in doing so they have simultaneously managed to turn one of their primary capacities, the advanced capacity to understand nature and the changes they are making to it, against themselves. The form in which such knowledge is available and is manipulated ensures that their appreciations remain in limbo. (ibid.)

Without romanticising the relations of people in pre-industrial societies towards the natural environment, Dickens nevertheless points out that the combination in modern societies of capitalism, modernity and speciesism—with their corresponding central practices and values of the commodification of nature, the division of labour and fragmentation of knowledge, and anthropocentrism—has led to the alienation of people from their ‘everyday knowledge.’ In other words, it is not all kinds of knowledge of the world that are alienated in the current socio-cultural context, but rather knowledge of an everyday, practical kind. It emerges while

[...] everyone engages in making and communicating all the time, and it will be developed differently according to the historical and environmental conditions in which people are located. It is this type of skill and knowledge which should be referred to when we are talking of the ways in which many people’s understanding of the relations between themselves and nature becomes alienated in modern society. (1996: 69)

If such knowledge becomes alienated from its practitioners, the questions remain of how it is possible for people to carry on with their day-to-day tasks, and how, more often than not, they succeed in achieving their immediate goals. Moreover, from Dickens’s presentation, it seems that this practical knowledge could be treated as separate from people’s engagement with the environment. I take a different perspective. If we find a certain failure in the understanding of the relations between people, and between people and the natural environment, it must be rooted in current patterns of sociality and of practical engagement with non-human components of the environment.

I am not denying the existence of a wider structure of feelings where commodification, fragmentation of knowledge and fundamentalist anthropocentrism might lead to alienation from nature, but it is necessary to look at the concrete level of people's lives to understand better their interplay or even the possible absence of alienation. This problem of how people gain knowledge of the world leads me to the final area of conceptual clarification with which we have to deal, concerning environmental affordances and the constitution of the environment for a community of practice.

Environment, perceivers and affordances

That humans know something about their surrounding objects and events is part of the common sense of ordinary people as well as a generally accepted idea in science. The questions of what they know, how they know, how they express their knowledge and why there are differences among people in their knowledge of the world are key issues, in social anthropology in general and particularly for those scholars and lay persons who are interested in so-called environmental issues (e.g. Milton 1993; Descola and Pálsson 1996b). These issues have been central to theoretical discussions concerning environmental perception, i.e. the process by which people come to know the world they inhabit.

The classical debate in anthropology concerning environment-culture relations has oscillated between the adaptationist approaches (e.g., Fox 1989) and culturalist responses (e.g., Salhins 1976). The former perspective states that culture is a specifically human means of adaptation to a given environment and that it can be explained in accordance with neo-Darwinian principles of natural or cultural selection.

The cultural approach, on the other hand, while rejecting any form of biological determinism, offers similarly mechanical explanations. For culturalists, culture is a set of rules, values, or patterns, transmitted from one generation to the next in a particular social and ecological situation, that contributes symbolic meanings to an otherwise meaningless world. For instance, Salhins (1976), arguing against the 'utilitarian' or 'naturalist' explanations in anthropology, points out that:

[T]he distinctive quality of man [is] not that he must live in a material world, circumstance he shares with all organisms, but that he does so according to a meaningful scheme of his own devising, in which capacity mankind is unique. (Salhins 1976: viii)

He adds,

The general determinations of praxis are subject to the specific formulations of culture; that is, of an order that enjoys, by its own properties as a symbolic system, a fundamental autonomy. (ibid. :57)⁴

The cultural model(s) people do supposedly have in their minds, are transmitted mainly through language, which is considered to be the foundation for culture. It is supposed that the same process has gone on generation after generation, each generation receiving its cultural models from the previous one, back to a remote origin that could only be evoked through the mythic memories of the living members of a culture. Younger generations of people in a particular society receive a set of rules and representations of the world that will guide them to fit the world to their needs. The culturalist approach rejects the biological determinism of the adaptationist theory and considers culture as an autonomous system existing in a different order of reality from

nature (see Lévi-Strauss 1969); nevertheless, it shares with biological adaptationism a mechanistic view of culture as a closed system of representational knowledge to be internalised and then transmitted to the next generation. Culturalism concentrates its efforts on understanding how the mind (or the symbolic system) operates, because it is seen as the active pole, while the environment is seen as a given, more or less stable set of externalities. Therefore, for the culturalist approach, features of the environment appear to take on a certain order only by virtue of the intersubjective 'negotiation' among people. Nature is chaotic and meaningless until a collective cultural model gives the people the categories to understand it.

In sum, both adaptationist and culturalist approaches attempt to dissolve the nature:culture dichotomy by subsuming one pole under the other (Descola and Pálsson 1996a: 11). Furthermore, both of them see a disordered external world that becomes full of meaning only through the use of the human mind's higher faculties. In recent years, an alternative approach to both adaptationism and culturalism has been developed in anthropology. This still developing approach conceives of environmental perception not just as the result of internal mental mechanisms, but as the continual process of picking up information from the surroundings by a whole human organism as it moves around in the world:

Knowledge of the world is gained by moving about in it, exploring it, attending to it, ever alert to the signs by which it is revealed. Learning to see, then, is a matter not of acquiring schemata for mentally *constructing* the environment but

⁴ It is interesting to see the conceptual shift made by Salhins, who in 1964 wrote: 'There is an interchange between culture and environment, perhaps continuous dialectic interchange, if, in adapting, the culture transforms its landscape and so must respond anew to changes that it had set in motion. I think the best answer to the received controversy over which is the determinant, culture or the environment, should be this: both—the answer lies at both extremes' (Salhins 1964: 133). Despite the maintenance of a strict dualism between culture and the environment, this passage shows a less biased approach to the problem than appears in later works. (See Horigan 1988: 33 for a critique of Salhins and other North American culturalist anthropologists.)

of acquiring the skills for direct perceptual *engagement* with its constituents, human and non-human, animate and inanimate. (Ingold 1996b: 141-2)

In this way, the environment of a (human or non-human) organism emerges alongside the organism itself, together comprising a 'developmental system' (Oyama 1985). There is no environment without an organism moving within it, and vice versa. The features of the environment for a particular organism are use-values or 'affordances', to adopt a term first proposed by the ecological psychologist J. J. Gibson (1986). For him,

The affordances of the environment are what it offers the animal, what it provides or furnishes, either for good or ill. (1986: 127)

These use-values emerge from significant relations between the physical characteristics of the objects (e.g., spatial patterns; attributes) and the practical uses of them (e.g., manipulation; transformation). As Sigaut suggests, 'it is only when we know something precise about how a society works that we can ask relevant questions about its environment' (1996: 431). The practical use of objects is constrained by the materiality of the objects and the skills of the users as social beings. Therefore, there are two main tasks for a researcher in understanding the process of environmental perception: the description of components of the environment and the analysis of the subjects' ability to apprehend them in practice. These two elements are synthesised in the production of environmental affordances. This way of conceptualising the relation between a person and an environment puts agency on both sides of the synergistic relation. Thus, a person and an environment form a dynamic unit. When we grasp the reality of each component of the relation, the other will inescapably come into play (Levins and Lewontin 1985: 284).

This approach holds that culture, seen as representational knowledge of the world, is not prior to but consequent upon the engagement of humans in their environments. Thus, environmental perception does not involve the imposition of a model upon nature, but rather the continuous seeking of information in the environment that could be expressed to oneself (through reflexivity) or to other humans (through cultural communication) in the form of symbols. Not everything that is perceived is represented or expressed. Indeed, most of our activities seem to be performed without being accompanied by representational knowledge (see Dreyfus and Dreyfus 1987; also Keller and Keller 1993: 127). In the study of environmental perception, we need to analyse the relation between how people perceive and how people express their perceptions once they disengage from practical activities, rather than concentrating only on forms of cultural expression as traditional anthropology has done. Both of these dimensions must be explored in the social context of peoples' actions.

It is possible to think about the existence of 'something previous' to our behaviour and movement in the environment: this is the collectively experienced practice of past and present generations. It follows that each generation of people develops its own perception of the world, but they do so departing from an existing environment which is the result of past generations' activities (Ingold 1998: 173). There is thus an interplay of freedom and constraints in every perceptual process. The accumulation of past events (and the knowledge involved) makes up the context in which the social individual is born, lives, and will die after attaching his/her own results to the flow of life. It is in this interplay between the past actions of previous generations and present perception that we can find the sources for the 'canonisation of affordances' (Costall 1997). That is, from the multiple potential affordances (meanings) of each animate or inanimate object,

place or event in the environment, a community of practitioners would realise just a limited number of them, because current practices need to cope with previous understandings of the relations between persons and the environment. Ellen has criticised the use of the category of 'affordances', and the notion of the direct perception of the environment implicit in it, on the grounds that,

[...] relational 'affordances' grounded in practice are almost always first translated into abstract cultural knowledge suitable for storing and recall which is not necessarily relational in character, at least not in the initial perceptual sense. It is this reorganized knowledge which feeds back into practices of perception. We do not learn them as affordances. Most of what we do is habitual, not novel, and we act or react to culturally situated cues with culturally routine responses. (1996a: 29)

I believe that what Ellen understands as culture, i.e. 'reorganized knowledge which feeds back into practices of perception', might be included in the theory of social affordances. The idea of affordances does not deny that cognitive models of the environment operate or that ideologies of places are held by people. Yet, these more abstract ways of classifying and communicating perceived affordances are rooted in the practical engagement between persons and their environs. There is a dialogical relation: the phenomenological experience is abstracted through representational thought, but the abstract construct needs to be regularly connected with the lived experience in order to be relevant for practical purposes. As Reed puts it,

Some of the affordances detected may be natural, as it were, having to do with the fundamental ecology of our lives. Some of them may be cultural, having to do with historically specific meanings and values. [...] We select specific aspects of ecological information, and we codify this information in culturally developed ways, creating discrete (and often warring) communities of meaning. But both affordances and information, no matter how culturally organized they have become, have their roots in the direct perception of the environment. (1988a: 310)

Therefore, cultural meanings are part of the environment of a person or group of persons, and they have to cope with them daily as they do with other constituents like objects, places and ecological events. The eventual mismatch between direct experience and received representational constructs is one of the bases for the frequently contested shifts of ideas about nature-society relations in human history.

To sum up, the theoretical framework of this thesis set out from an ontological position that sees human knowledge of the environment as constituted in praxis. This praxis involves the material manipulation of technologies to produce what is needed to satisfy historically determined needs, and allows the emergence of environmental affordances: meaningful relations between a perceiver and what is to be perceived. This praxis is not conducted by human individuals in isolation from other conspecifics, but is from the start a social and purposive action constrained by previous transformations of nature, established social networks and symbolic representations of human experience. The cumulative nature of human praxis, objectified in material things, political arrangements, legal norms and ideologies can be seen, from our present perspective, as leading to an alienation of people from nature that corresponds to a seeming process of alienation among people themselves. By alienation I mean local people's diminishing social control over economic, technological and ecological processes. This lack of control goes hand in hand with the increasing disembeddedness of nature from society, which might become antagonistic entities. This social trend is both cause and effect of the modernisation of general life among farmers in Uruguay. However, that modernisation has alienating effects is only a hypothesis that needs to be empirically confirmed or rejected in particular settings. In this case study, the variables to be observed revolve around the current working practices of farmers, the techniques used

to transform the material world, the social relations constituted to enact the multiple processes of production—including property relations and the organisation of labour, and people's explicit understandings of their relations to inanimate objects, animals, plants, places, events and other persons, all of which are constituents of their present environment. The observation and analysis of current relations between people and environment will be placed in local, national and global historical contexts.

Outline of thesis

The remainder of this thesis is organised in six chapters. In chapter 2 I shall present a general outline of the historical co-evolution of society and the environment in Villa del Rosario, connecting them to wider issues of the modernisation of the countryside and the different forms of integration of Uruguay into the world economic system. The chapter sets out the economic, social and political processes that led a group of *Canarios* crop farmers in the area under study to convert to modern dairy farming in the late 1980s. It reveals the increasing humanisation of the landscape and consequently the complex effects of changing social relations upon the non-human components of the environment, and how the latter transformations led to the emergence of new affordances. Chapter 3 is devoted to depicting the technical and social aspects of modern dairy farming as developed in the catchment area of Villa del Rosario. I shall describe the material dimensions of new techniques for growing crops and raising cattle, showing how these embed forms of labour organisation and how the adoption of new technologies is intimately interwoven with the institutional aspects of the dairy agribusiness. Moreover, current changes in the traditional gender and generational divisions of labour, inter-household co-operative relations and the engagement of local

farmers in both commodified and non-commodified labour relations will all be explored. The chapter highlights the dominant trend towards the individualisation of dairy farms and the externalisation of agricultural practices, but simultaneously describes how local people attempt to keep control of their production and sociality.

The following three chapters will address more particular processes of perceiving and representing environmental affordances in the ethnographic present. Chapter 4 deals with the emergent practical and symbolic meanings of 'places' among *Canarios*, and the links between emplaced practices and the symbolic construction of more abstract spaces. A description of people's engagement with houses, fields, milking parlours, the neighbourhood, the nested places in the village and 'the zone', and people's conceptions of virtual spaces like the nation and the regional market, will form the basis for my argument that there is a dialectic process of engagement and detachment between place, practical space and de-localised space. The rise of new meanings of place and space, I argue, was influenced by material changes in the patterns of movement of persons, goods and information through the environment and the consequent construction of a different notion of 'the rural' as a place to dwell. Chapter 5 presents the other side of the coin, i.e. the contested temporal dimension of the livelihood of dairy farmers. It brings out the tension between the task-oriented time perspective intrinsic to dairy farming and the clock-oriented time perspective built in to the operation of a capitalist society. On the one hand, people's attitudes towards time are intimately related with local weather conditions and the tuning of people's perceptions to the lifelines of animals and plants and to local sociality. On the other hand, local farmers have to cope with an abstract commodity-time perspective that is proper to the capitalist mode of production but that nevertheless calls for a practically

unattainable transcendence of experienced differences of social and natural timing. The current solution to such tension seems to rely on technological innovation rather than social adjustment.

In Chapter 6 I turn to the milking routine as the most salient example of an activity system on a typical dairy farm. This is the practical setting in which I analyse the interfaces between machines, dairy cows and milkers. The first part of the chapter shows the changes brought about by the introduction of mechanical milking in the development of new embodied skills, with the emphasis on the mutuality between the working environment and a milker's perceptual systems. I argue that the adoption of mechanical means for the suckling of milk has kept working skills at the core of the process of production, which is characterised as a 'workmanship of risk' (Pye 1995). It is thus an example of machine-use that does not lead to alienated work, because the process of production is still under the direct control of the producers, though there are important differences between family and non-family dairy farms. The second part of the chapter focuses on the relations between dairy farmers and dairy cows. At the centre of the analysis are the ambivalent attitudes of dairy farmers towards domestic animals. It is shown how the goal of increasing cows' productivity might lead to a certain estrangement between farmers and animals that is reflected, for instance, in the dominant mechanistic metaphor used in talking about dairy cows. I shall propose a homology between human-animal and human-human relations as currently constituted in Villa del Rosario, though the alienation entailed in each is more clearly observed in the case of large-scale dairy farms.

Finally, in chapter 7, I draw some conclusions from this study and synthesise the contributions of the thesis to the practice of anthropology. The principal conclusion is that in carrying on their livelihoods, *Canarios* dairy farmers swing between a form of engagement that keeps them closely in touch with their natural and social environments, and an attitude towards the environment increasingly affected by a kind of institutional alienation. The causes for such interplay are rooted in the growing connection of the day-to-day life of farmers to the global forces of modernisation, which they try to domesticate but which nevertheless, are increasingly out of their personal control.

Chapter 2. Local history: social and ecological inheritance

The first basic premise of history is that it is *created* by *man*, but its second, equally basic premise is the necessity for *continuity* of this creation. History is only possible at all because man does not always start over again from the beginning and instead follows up the road and results of past generations. If mankind were to start each time from square one and if every action were without suppositions, mankind would never budge from one place and its existence would move in a circle of periodic recurrence of an absolute beginning and an absolute end. (Kosík 1976: 145)

Introduction

This chapter presents the co-constitution of the physical environment and human social life in Villa del Rosario in a historical perspective. To understand the ethnographic present of the rural peoples of Uruguay in general, and the case of modern dairy farmers in particular, it is methodologically necessary to start by focusing on the processes of becoming rather than on descriptions of being⁵. This is a simple conclusion of recent works, both in ecological anthropology (Descola and Pálsson 1996b) and environmental history (Worster 1993: chapter 3). Indeed, recently, scholars have attempted to transform previous anthropological questions on the environment-society (or culture) interface by adopting a more dynamic approach than they had done hitherto. One of the most fundamental conceptual shifts seems to be the realisation that human social relations are not constituted against a passive background of non-human living beings and geo-physical structures, but rather in changing environments where human agency is one among many forces that alter previous situations. Non-human agencies are not, essentially, less important than people's actions in the evolution of particular locales. It

⁵ Truly, the state of being is at the same time the process of becoming. Rose (1998) has defined this overlap of continuity and change as the central property of all life, i.e. autopoiesis, by which he meant—following Oyama (1985)—‘the dialectic of specificity and plasticity during development’, or, ‘the dialectic through which the living organism constructs itself’ (Rose 1998: 18).

follows that one of the main anthropological questions to be addressed is: what are the continuities and discontinuities of human and non-human agencies? Moreover, assuming the anthropocentric nature of the discipline's enquiry, it seems fundamental to question why and how the role of humans in the determination of environmental components and their interrelations has changed in different historical periods.

Nowadays, there is a growing view that both human and non-human ecology are constituted by never-ending reciprocal exchanges between the physical forces and living organisms, between different species of animals and plants, and between co-specifics. However, this all-pervasive reciprocity does not lack asymmetries, which in turn lead to the belief that ecological relations are rooted not in equilibrium and harmony, a view promoted by ecologists until the 1980s, but rather in permanent imbalance and movement. There is no consensus among scholars about whether the dynamics of ecosystems follow any directional trends, such as towards increasing complexity (Lewin 1992). Nevertheless, it would be very difficult for anybody to argue, as Rappaport (1968) did, for homeostatic relations between human culture and the environment as a permanent state of affairs. Furthermore, in the face of a growing quantity of empirical research on the so-called 'politics of nature', it would be hard for anybody to defend the thesis that the attitudes and effects of all humans within their environments are equal. Indeed, environmental history and recent anthropological research have challenged the traditional concepts of culture and society understood as coherent and non-contradictory entities (Worster 1993: 40). According to their class, gender, age, religious affiliation, ethnic background and so forth, people would relate in different ways with non-human components of the environment. Hence, the guiding question of any study of the environmental history and ecological anthropology of

particular locales ought to be the identification of those different groups of people involved in the use of natural resources and how the relations between them have affected the way the environment has been transformed. Reciprocally, what are the effects of such transformations upon those groups of people and their practical and ideological interactions? (O'Connor 1998: 52).

In my attempt to answer these questions, I shall follow a methodology that focuses on the evolving form of subsistence practices carried out by different groups of people who inhabit the area under study. This methodological principle is inspired by Steward's definition of a 'cultural core' as 'the constellation of features which are most clearly related to subsistence activities and economic activities' (Steward 1973: 37). I shall analyse the main changes in production techniques, the organisation of work and political struggles from colonial times to the current period of scientifically informed farmers. Taking human agency as the centre of my enquiry, I shall also identify non-human living species and physical forces which appear to have co-operated with the former in modifying the lived environment. In other words, I am interested in those physical, biological and social processes that have affected human sociality and the relations between particular groups of people with their biophysical environment. I shall document the ecological and social conditions that have been experienced by different generations of rural dwellers in Villa del Rosario, and how people coped with them as constraints and possibilities to make their livelihoods.

Colonial times, Euro-Amerindian encounters and settlement (1516-1825)

The actual territory of Southern Uruguay seems to have been inhabited since at least 12,000BP by low-density groups of nomadic people. These Amerindian people appropriated a varied range of natural resources from the ocean coast to inland, practising seasonal plant and seed gathering and small-game hunting. The nature of their social organisation is still unknown⁶. For almost two centuries after the first landing of a Spanish expedition in 1516, Europeans were not interested in these 'marginal' territories and only became so when they saw the land affording a different kind of wealth and geopolitical significance. Nevertheless, they did influence the shaping of the local environments prior to the establishment of their first settlements. According to historians, the introduction of cattle by the Spaniards in the early 17th century and their rapid reproduction, due to plentiful pastures and despite fierce predators including humans (Panario 1994: 39), radically transformed the environment, and consequently the natives' way of life. It is possible that the lack of knowledge about prehistoric ways of transforming the environment might have led scholars to identify the introduction of cattle as the first significant human impact upon the indigenous environment in the former *Banda Oriental del Uruguay* [Eastern Margin of the Uruguay River]. Nevertheless, the presence of grazing cattle through the free-range pastures is a landmark in the evolution of local environments mirroring what occurred in the original southern European countries (Crosby 1988). For instance, softer grazing prairies replaced small, rough bushes (mainly *Empatorium buniifolium*) following the relatively

⁶ Recent archaeological findings have been interpreted as evidence of a more complex social organisation than previously believed (Bracco, Cabrera and López Mass 1998). However, there is a lack of continuity between prehistoric social formations and those societies encountered by the first Europeans who arrived in the southern coastal areas at the beginning of the 16th century.

unconstrained movement of cattle (Gore and Gepp 1978: 25)⁷. Charles Darwin (1860)

pointed out that

According to the principles so well laid down by Mr. Lyell, few countries have undergone more remarkable changes, since the year 1535, when the first countless herds of horses, cattle, and sheep, not only have altered the whole aspect of the vegetation, but they have almost banished the guanaco, deer, and ostrich. Numberless other changes must likewise have taken place; the wild pig in some parts probably replaces the peccari; packs of wild dogs may be heard howling on the wooded banks of the less frequented streams; and the common cat, altered into a large and fierce animal, inhabits rocky hills (Darwin 1860: 126-7).

Furthermore, Crosby (1988) pointed out that European weeds (e.g. thistles) spread rapidly due to the transportation of seeds in animals' bodies and dung, in an analogous way to that in which germs were carried by human migrants from the Old to the New World with terrible effects on the health of native populations.

On the other hand, whilst there are difficulties in establishing how Amerindians gained their livelihoods before the Spanish colonisation, what seems to be clear according to the conquerors' chronicles is that, during the 18th century, the Europeans encountered people already skilled in cattle hunting and horse taming (Pi Hugarte 1993). For instance, Vidart (1969) defines the Amerindian economy and sociality as an 'equestrian culture'. The Europeans at that time were almost exclusively interested in the acquisition of animals hides, and it seems that the native people engaged in barter with them. However, relations were not always harmonious when the natives and Europeans (and their descendants) started to compete for the same resources. According to written records, some native people contested the advance of Spanish colonisation, and the

⁷ The massive expansion of sheep-farming in the second half of the 19th century was possible thanks to this unpredicted long-term consequence of cattle grazing. Furthermore, the ecological opportunity to practise sheep herding would become the material basis for a growing middle

ethnic group most often referred to in this respect were the so-called *charrúas*. Moreover, inter-ethnic conflicts arose when many *charrúa* groups engaged in pillage which had become more profitable than direct hunting in those areas where Europeans had built permanent settlements (e.g. primitive ranches or *estancias cimarronas*) (Pi Hugarte 1993: 93). Conversely, European settlements in the south of Uruguay were both a prime cause and consequence of the struggle against native people⁸, as well as having the military function of keeping political control over territories contested by the Spanish and Portuguese empires. The scattered human population in the country meant that direct human intervention did not cause any significant transformation of the landscape, though the practices of burning prairies to get rid of weeds, and riverside deforestation, might have been of some importance (Panario 1994: 39).

Montevideo, the capital of Uruguay, was founded between 1726 and 1750, to mark Spanish sovereignty over the territory of the *Banda Oriental*—‘owned’ by the Spanish Crown according to Tordesilla’s Treaty signed in 1494—in the face of the advance of the Portuguese Empire from the north and east. Montevideo’s natural conditions and location soon led to its becoming an important port for export, mainly of cattle hides, to Spain and England (Caetano and Rilla 1995). On the other hand, the southern part of the current province of Lavalleja, where I conducted fieldwork, was historically the eastern boundary of Spanish colonisation in Uruguay during the 18th century (Alvarez

class in the countryside amidst the traditionally rich cattle ranchers. This is a good example of the synergy between environmental and social forces.

⁸ Their nomadic life style was frequently opposed to the interests of Spanish and *criollo* landowners, until a ‘final solution’ was achieved. The historical record shows that in 1831 ethnocide occurred in the northern locality of *Salsipuedes*, where official military forces killed most of the male members of the *charrúas*. Surviving women and children were scattered around the country. It seems that their assimilation into the hegemonic European culture was rapid, despite some actual claims of ‘cultural survival’ in the form of myth and practices associated with a supposed harmonic relation with Nature. (On the relation between ranching and the extermination of indigenous populations of human hunters, see Ingold 1980: 238.)

Lenzi 1972). The Minas' mountain range to the east represented a natural boundary to Montevideo's Council Jurisdictional Area. The current capital of the province of Lavalleja was founded in 1784 by 40 Spanish families from the Canary Islands with the 'help' of 145 evangelised *guaraní* indians (Barrios Pintos 1983). (See plate 1) According to Ximénez and Gomila (1970:8), the town of Minas was founded in response to the need of the Montevideo authorities to improve the security of colonists against the riots of *charrúas* in its catchment area, as well as to stop the Portuguese advance across this frontier. Therefore, it had a mainly military function. Also, rumours about the presence of gold and other minerals attracted a few adventurers to this unpopulated area. Most European migrants were peasants who had failed to settle on the Patagonian coast in Argentina and were brought to the *Banda Oriental*, whilst the *Guaraní* people came from the Northern Jesuit missions. The surrounding territory was 'inhabited' by nomadic Amerindians and *gauchos*. The latter were mobile *criollo* cattle hunters who worked for European urban entrepreneurs, or under the patronage of the few European settlers who started to live in their remote *estancias*⁹ in the countryside. The environmental impact of the emergence of the town of Minas was insignificant, though subsistent farming was practised in small plots or *chacras*. The rest of the area continued to be the realm of herds of wild cattle and a few humans who hunted them. In 1833, Darwin observed during his ride through the 'village of Las Minas':

The country was rather more hilly [than in the southern coast], but otherwise continued the same; an inhabitant of the Pampas no doubt would have considered it as truly Alpine. The country is so thinly inhabited, that during the whole day we scarcely met a single person. (1860: 53)

⁹ *Estancias* at that time were large land-holdings whose only recognisable sign of existence were their "*casco de estancia*", or residences, dwelled in by a couple of permanent workers and their families and, rarely, by the landlord himself.

To sum up, there were few human inhabitants in southern Lavalleja during most of the colonial period, so that their direct activities left little material traces in the landscape which might have constrained the choices of future generations for their own environmental development. The mode of production, based mainly on cattle hunting in the context of a primitive mercantilist economy, was indeed dependent on limiting human contacts with other living organisms in their environment. On the other hand, cattle initially introduced by human choice but left relatively 'undominated' for centuries, were the most powerful living agency for the conversion of existing grass, plants, and bushes. Moreover, the extended presence of cattle in the landscape of native Amerindians seems to have radically altered subsistence practices from their pre-European form, though almost nothing is known about the changes it might have caused in the character of intra-group social relations. On the other hand, inter-ethnic contacts between the different native groups and 'white' entrepreneurs, merchants, and military forces took on an ambiguous character. In terms of the social appropriation of natural resources, the next generations of people during the independent period would have inherited a quite flexible social structure. However, access to a means of livelihood in the southern part of the country had become more limited at the end of the colonial age, due to the increasingly violent appropriation of land in the context of a very fuzzy land tenure system (Kleinpenning 1995: 56).

Independence times and the possession of land and cattle (1825-1870)

The first three quarters of the 19th century do not show a sharp distinction with previous times. Although the population increased, cattle herding as well as hunting underwent a few changes and, what seems more important, political struggles acquired new

meanings in the process of the establishment of an independent nation. Although the area studied was intended to be populated by new colonists, it remained scantily populated until the second half of the 19th century (see table 1). There are four main reasons for this. Firstly, land in the jurisdiction of Montevideo became private property at a very early stage, discouraging settlement by independent farmers. Moreover, besides the distribution of *chacras* among the residents of the first villages, including Minas, neither the Spanish authorities nor later independent governments supported any significant advance of agriculture into the grazing prairies. Secondly, the countryside experienced continuous violent disruptions and struggles between local leaders [*caudillos rurales*] from before the independence of the country (1825-28) until 1870, when a disciplinary military government started to build up a modern centralised nation-state. Furthermore, rebel *criollos* and foreign bandits terrified settled colonists, stealing their cattle. Also, they attacked travellers during their journeys, turning the countryside into a dangerous place. Thirdly, civil war between the two traditional organised political forces, the *Colorado* and *Blanco* parties, was the norm after independence, with forced conscription of adult men and the collection of food and horses for transportation. Fourthly, on arrival in Montevideo, most migrants were offered more valued job opportunities in the capital city than what rural production could offer them (Finch 1989: xvii). Moreover, those who moved to the countryside had not only to cope with the situation of social anarchy, but also to deal at the economic level with aggressive merchants who acted as privileged intermediaries.

Year	Population	Growth rate (%)
1852	8089	
1860	12852	63,0
1878	20991	68,0
1900	35203	46,0
1908	51222	29,0
1963	65823	-1,0
1975	65180	-0,8
1985	61466	-5,6
1996	61089	-0,6

Table 1. Evolution of population in the province of Minas/Lavalleja, 1852-1996.
Sources: Galeno, N. (1878); Barrios Pintos (1983); Millot and Bertino (1996: 130-1); INE (1997a: 3).

It was mentioned above that lands in the south of the country, including the area under study, were rapidly converted from royal property to individual private property during the colonial period. Land was distributed among Spanish and *Criollo* landowners who received at least a '*suerte de estancia*' (equivalent to 1875 hectares) from the Crown (Millot and Bertino 1996)¹⁰. Individuals received it as a form of payment for their services to the Spanish Crown (Barrios Pintos 1983: 91-2), or they bought it from local authorities desperate for cash to pay their internal and external debts. In the 13th district of Lavalleja, the administrative unit containing Villa del Rosario, as early as 1770, a large strip of the Santa Lucía River (56.000 hectares) was sold to María Antonia de Alzaibar¹¹ (*Banco Hipotecario del Uruguay*, Salida Fiscal No. 17). This was just a small part of the family's total real estates (Ximénez and Gomila 1970: 6). In 1792, to mention another recorded case, the Montevideo Council sold land to a man called Félix López, which was inherited by his three sons after his death. Interestingly, a significant part of the toponymy of the area evokes these first landowners who settled there (e.g.

¹⁰ Millot and Bertino (1996) point out that one '*suerte de estancia*' of natural prairies could feed 1,125 head of cattle.

cañada Garrido and *cañada del Pato*). Therefore, private property was the common land-tenure system from the 18th century onwards, being imposed by the Spanish Crown and followed by independent Uruguayan authorities after 1825. According to available data, by 1811, the area under study was characterised by a mixture of very large and medium sized holdings oriented to livestock herding (Milot and Bertino 1996). However, despite an established legal system that promoted the private appropriation of land and cattle, the countryside was characterised by a general 'disorder' in practical land possession. This was the result of a combination of the predominant mode of production and the political struggles to keep control over the territory.

The mode of production might be characterised as 'proto-ranching' (Ingold 1980: 240). The rationale of the system was to enlarge cattle herds by leaving them to reproduce without human intervention and make a roundup [*rodeo*] once a year, to kill as many animals as possible to extract their hides¹². The proto-ranching system, or *estancias cimarronas* as it is known in the Uruguayan tradition, represented the economic and social unit of production in the countryside during the so-called pastoral and *caudillo* age (Barrán and Nahum 1984), which lasted until the last quarter of the 19th century. This period is distinguished, among other processes, by cyclical depletion of natural grazing lands and animals, due to overgrazing and overhunting (Jacob 1984: 9). The fact that the most economically relevant social wealth was the ownership of cattle on a

¹¹ María Antonia de Alzaibar bought the land from the Governor and General Captain of the River Plate Province. One year later, in 1771, it was transferred to her kin, María Francisca de Alzaibar, widow of José Joaquín de Viana, the first governor of Montevideo.

still open and undivided pasture range would have led the powerful owners to neglect land regularisation and delimitation in favour of free human movement after animals during organised hunting campaigns. It is not surprising that cattle marking emerged long before land marking as a means for the social appropriation of wealth.

On the other hand, permanent violence and the decentralisation of power as a result of the continuous imperial and *caudillos*' disputes over territory strengthened the fuzzy land tenure system in the absence of any strong administrative body that might have analysed, modified and monitored the situation. Warfare led to endless changes in the authorities that distributed land and ownership titles to benefit their temporarily powerful allies¹³. Land was redistributed by expropriation from defeated enemies or by the arbitrary delimitation of overlapping plots. (Kleinpenning 1995).

By the end of this period, the country continued to show few enduring signs of human transformation of landscapes. This is not surprising, given to the periodical depletion and destruction of natural and human-made resources like cattle, houses, cultivated fields, and so forth. It was the unavoidable consequence of intermittent warfare between local parties, plus the regular intervention of foreign military forces throughout the period (e.g., the Brazilian army). Moreover, people seem to have been predominantly mobile, hence the lack of relatively durable buildings outside a few *estancias* and

¹² This is an interesting case of the early 'specialisation' in animal exploitation identified by modern analysts as a main characteristic of factory farming (see Noske 1989). Marx (1987) used it as an analogy to explain the fragmentation of workers' skills in manufacture. He wrote: '[Manufacture] converts the labourer into a crippled monstrosity, by forcing his detailed dexterity at the expense of a world of productive capabilities and instincts; just as in the States of La Plata they butcher a whole beast for the sake of his hide or his tallow' (Marx 1987: 439).

¹³ The Artiguist's agrarian reform (1815), led by the national hero José G. Artigas (1764-1850), appears to have been the only explicit political project aimed at legalising land ownership for the benefit of the lower social classes, though it did not attempt to expropriate all powerful landlords (Jacob 1984: 9).

villages. On the other hand, there appears to have been a tendency for the private appropriation of both cattle and land by powerful individuals and families, though this was contested by spontaneous and organised pillage. Access to 'Nature', thus, was still generalised for those who might have the means for the sometimes legal and mainly violent defence of such a privilege, who were increasingly the powerful ruling classes associated with Montevideo's international commerce and administration.

'Modernisation' of the countryside and the constitution of the locality of Villa del Rosario (1870-1940s)

New order in the countryside: the enclosure of land

During the last quarter of the 19th century, people in the countryside experienced a growing objectification of individual land and cattle ownership, which had hitherto been rather theoretical. As mentioned above, proto-ranching was based on free access to pastures, but now real control over pastures meant better management and protection of cattle herds. The aim was to stop overgrazing and theft (by humans and non-human predators, i.e. wild dogs). Indeed, complaints increased when not only hides and tallow but also meat and other parts of the animals (e.g. horns) were in demand in international markets and technical innovations provided the means to transport them¹⁴. Moreover, the need to improve cattle breeding and the development of the alternative of sheep herding led to a slow but steady shift from proto-ranching [*estancia cimarrona*] to modern ranching [*estancia moderna*].

The ruling classes aimed to improve the economic and social conditions of livestock production in the countryside, not only to secure the wealth of rural enterprise but also to advance an explicit project of greater national integration into the increasingly consolidated world capitalist system. In local terms, this meant the organisation of centralised state control over local political *caudillos* and autonomous gangs and the approval of a set of ordinances to prevent the violation of private property. Thus, powerful *criollo* landowners combined forces with new migrant ranchers, mainly of British origin, to force the national authorities to implement measures to convert the established legal tenure system from abstract law to a more tangible reality. The means to achieve this goal were the organisation of a professional national army to monopolise the use of military force, and the establishment and enforcement of the first Rural Law (see *Código Rural de la República Oriental del Uruguay* 1994). Both of them were achieved under the rule of a military government headed by Colonel Lorenzo Latorre (1876-1880). The ideas contained in that rural legislation represented the view of the recently created *Asociación Rural*, a mixed body of progressive *criollos* and immigrant latifundists.

One of the most important laws provided for the compulsory fencing of fields. Wire fencing was chosen, mainly because of its lower cost, but also because it could not cause any great damage to either cattle or men¹⁴. Kleinpenning brilliantly sums up the economic and technical consequences of fencing:

The fences made the rodeos largely superfluous and so reduced labour costs. They facilitated a division into paddocks and so made possible a more efficient

¹⁴ Certainly, the use of cattle meat to produce jerked meat [*tasajo*] had been very important since 1830, especially to feed slaves both in Cuba and Brazil. Yet, by 1915 its economic significance disappeared when it was replaced by the frozen meat industry.

¹⁵ In some parts of the country there were scattered wooden and stone fences, as well as ditches to separate paddocks. All of these were replaced by wire fences (Kleinpenning 1995: 140).

exploitation of the grazing land. They facilitated the grading and care of the livestock, thus making crossbreeding easier and leading to higher yields and profits. They increased the value of the properties, led to the consolidation of ownership, reduced boundary and livestock ownership disputes, limited the damage to arable fields by straying livestock, hindered vagrancy and cattle thefts and so brought peace and security to the countryside. (Kleinpenning 1995: 141)

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On the other hand, the erection of wire-fences had a great impact on the lives of the thousands of 'illegal' settled peasants, and mobile *gauchos* of the countryside. In two decades, they were detached from their means of livelihood and moved to rural shantytowns¹⁷ or to main towns, where neither the industrial nor the service sectors were able to incorporate them as labourers. Furthermore, four years after the first *Código Rural* was approved, new provisions were added, including the compulsory sharing of fencing costs between immediately neighbouring farmers. The effect was that poorer farmers could not afford it and had to leave their plots, so that there was an acceleration in the concentration of land. (Kleinpenning 1995: 140). At the top of the new social pyramid in the rural areas were the wealthiest landowners, who monopolised land and beef cattle, next the middle classes, made up of sheep herders, traders and new professionals needed to give technical advice, then permanent waged-workers [*peones*], and finally, displaced people.

¹⁶ The transformation of proto-ranching to modern ranching in Uruguay followed the same developmental pathway as in contemporaneous change in the Argentinean pampas and the high plains of the United States of America, as described by Ingold (1980). (See also Osgood (1929) for the North American case.) According to Ingold, in modern ranching, the emphasis shifts 'from the quantity to the *quality* of stocks' (ibid.: 246) as soon as territoriality is secured, i.e. private control over limited pastures. The reason resides in the need to maximise the organic processes for beef production in a strategy of herd-size limitation. The animal population is reduced to avoid overgrazing and the transmission of diseases. Therefore, by improving the quality of stock, 'the stockman can enhance the value of his investments without increasing absolute numbers' (ibid.: 246). Moreover, the fencing of plots was required not only to delimit pastures but also in order not to mix cattle that had been carefully bred with relatively wild and rustic animals (ibid.:247).

¹⁷ These rural shantytowns were called *pueblos de ratas*, literally translated as 'villages of rats'.

Another consequence of fencing was, and still is, the crystallisation of particular paths in the environment for human movement and travelling in the country, not always based on people's previous experience but on the possibilities left open by fenced lands.

It should be noted that at the same time that land and cattle were concentrated in fewer hands, a counter-tendency occurred in the division of holdings—even before fencing—which might help to explain the peopling of the area of Villa del Rosario at the end of the 19th century. The division of properties was an ongoing process. Big *estancias* were fragmented by successive inheritance, being divided between numerous heirs. Furthermore, the subdivision and selling of plots were common, revealing a dynamic free land market especially after land entitlement was regulated. Though there are no systematic studies of this phenomenon for the particular area under study (for the whole country see Kleinppening 1996), the cases shown in text boxes 1 and 2 below might help to illustrate the point¹⁸.

¹⁸ The information was found in the *Banco Hipotecario*'s documentary archive. There is a legal regulation called '*proceso dominial*', which states that an actuary would have to present the history of land ownership for the past thirty years before a legal transaction could take place (e.g. inheritance or trade). This information was partially accumulated in folders since the plot in question passed from state ownership to private hands, the so-called *salida fiscal*. However, there are several gaps in the data between the *salida fiscal* and more recent legal movements. Nevertheless, the reduced number of hectares involved in progressive transactions suggests that there was a continuous division of land.

- María Francisca de Alzaibar had owned the original estancia with 56.000 hectares since 1770.
- Part of the land, became the property of Eugenia Zeballos at the end of the 19th century. In 1921, her *estancia* was divided between 12 heirs.
- 577 hectares of the original Alzaibar's estate appears as property of Don Esteban M. Píriz in 1938. In this year, the estate was divided between four heirs (two sons and two daughters) who received an average of 140 hectares each.

Text box 1. Succession of land (I)

Source: Banco Hipotecario del Uruguay (n.d.), Salida fiscal N° 17.

- In 1808, Pedro Pérez del Pato applied for and received from the Montevideo Council 590 hectares of land classified as '*sobra de estancia*'¹⁹.
- From this original plot, there is a record of a succession (*Suseción Mereles*) whereby each heir received 100 hectares.
- A later record shows that, in 1924, Petrona Uriarte de Pichuaga had 227 hectares of her own.
- In 1949, the above plot was divided among her 5 heirs, each receiving an average of 45 hectares

Text box 2. Succession of land (II)

Source: Banco Hipotecario del Uruguay (n.d.), Salida fiscal N° 21.

The historical origins of Villa del Rosario: the '*chacras canarias*'²⁰

At the end of 19th century and the first half of 20th century, crop farming extended geographically along with a strong wave of European migration to southern Uruguay. Arable farming and mixed farming became an official issue interwoven with the official migration policy to bring new colonists. Agriculture was seen, firstly, as the solution to

¹⁹ The remaining land, after bigger estate boundaries, normally geometrically designed, were defined.

²⁰ There are no systematised historical records of the first settlement of crop-farmers in this particular area. I draw my information from people's own accounts, contrasted with some literature focused on the neighbouring province of Canelones and local written press sources. It is noticeable that elderly people gave me only fragmented details of the social and ecological aspects of the area as it was before their own families arrived there. Moreover, many of the names of geographical landmarks (e.g. mounds) are meaningless as timemarkers among locals, who ignore the origins of such names. Following Gudeman (1979: 233) I would suggest that these places are taken as naturally given and their names were not part of the social history. On the contrary, elders might give more precise accounts of the settlement at the turn of the 19th century when the oral transmission of information became more plausible due to more permanent interpersonal relations, though I found this knowledge still vague.

unemployment and settlement in the countryside, a constant worry for authorities since the fencing of fields. Secondly, in the context of an increasing population in towns, the expansion and higher productivity of agriculture were thought of as the basis for reducing labour costs and hence promoting more industrial investment. Finally, mixed farming practised by a middle class of family farmers became the ideal social type to contest the political dominance of the traditional agrarian upper class, whose essentially conservative interests lay in the maintenance of 'underexploited' *latifundio*, constraining the development of the national capitalist economy. The political forces embodied in the urban-oriented *Colorado* Party encouraged these transformations. Thus, from the first years of the 20th century, the *Colorado* government, which defeated in military terms its *Blanco* adversary, promoted a more progressive legislation and development strategy for the country as a whole, aimed to develop national industries. This official economic and social programme has been known as *Batllismo*²¹. In the agriculture sector this policy focused on the defence of small and medium holders against the *latifundio* and its natural consequence of rural-urban migration and the transhumance of rural workers (Barrán and Nahum 1984: 665). Finch defines its ideological background as 'humanitarian in its social dimension and *dirigiste* in economic policy' (Finch 1986: 39). Though the final goal of modernisation of livestock production to improve the external balance of trade was not truly achieved²², particular measures to settle small and medium farmers in the south of the country were relatively successful.

²¹ President José Batlle y Ordoñez's (1904-1907 and 1911-1914) political project, that survived his death, was to achieve the consolidation of the representative system of government and the modernisation of the traditional parties. Its support from the middle and working classes was the basis for the implementation of many advanced social laws (e.g., the right to trade unionism, divorce, separation of state and religion, openness to migration, etc.) (Finch 1989; Hoetink 1997).

In this wider context, the first crop-farmers arrived in Villa del Rosario at the end of 19th century seeking arable land, expanding the agriculture frontier and pushing cattle ranching to the north of the province. The province of Lavalleya, called the province of Minas until 1927, had historically been a territory of extensive livestock ranching. The crisis in livestock production brought about at the turn of the century by the combination of civil wars (1896-1904), adverse climatic conditions (i.e. recurrent drought), and the increasing absenteeism of landowners, encouraged the latter to lease part of their holdings to newly arrived agriculturalists (Millot and Bertino 1996: 201). It seems that land scarcity and higher rents in neighbouring regions, mainly in the province of Canelones, which had been the traditional area for crop-farming and farm products to feed Montevideo's inhabitants, pushed the second generation of European migrants to the east. Elderly people interviewed remembered the landlords who owned the greatest part of the land at the turn of the century, namely Esteban Píriz, Angel Zeballos and Temístocles Ortiz²³ (see text boxes 3 and 4 below). Thus, southwest Lavalleya became a zone of extensive crop farming, mixed with medium size livestock ranches. In 1900 the 13th District was the most densely populated area of the province with 8 inhabitants per square kilometre. Moreover, it was pointed out that there were ten steam threshing machines working in the area, reflecting the importance of wheat production (Machado

²² The development of the 'cycle of frozen meat' (Barrán and Nahum 1984), characterised by the incorporation of new technologies for the manufacture and transport of beef to world markets (mainly England), gave economic support to *Baillismo*'s public-spirited policies. Nevertheless, the new beef industry allowed and reinforced extensive livestock production for the benefit of the *estancieros*. Indeed, the wealth of the meat industry was due to the cheaper costs of production in the traditional extensive ranching system.

1900). The province's heraldic shield, created in 1927, symbolically shows this partition of the territory in productive (and social) terms, with arable farming in the south and livestock ranching in the central and northern regions (CONAE 1980) (Plate 4).

Grandfather Q accompanied his parents, at the age of six, to Argentina from the Canary Islands at the end of the 19th century. Due to a storm, their ship had to stop in Montevideo and the family decided to land and stay. His father and mother were employed in different *chacras* in the provinces of Canelones and Lavalleja, where other *Canarios* had already settled. He was also employed temporarily in the area of Villa del Rosario. His son, Father Q, finally settled as a tenant [*rentero*] in Zeballos' *estancia*. Later on, at the beginning of the 1950s, the official *Banco Hipotecario del Uruguay* (National Housing Bank) became his landlord after expropriation. Soon after, the State offered him a low-interest loan to buy the plot. Thus, in 1952, Father Q signed an agreement to pay a total amount of \$50,000 over the next thirty years. However, the family was ready to pay off their debt in only three years, due to very good harvests and high market prices for their products. Nowadays, the farm is legally divided into two parts, each for one of Father Q's sons, though it is run as a unit of production and consumption.

Text box 3. Immigration and land inheritance (I).

Grandfather O came to Villa del Rosario after renting a plot in Migueles (30 km away) from Angel Zeballos. The landlord repaid a debt to him with a plot of 48 hectares. Then, his eldest son inherited the farm and brought up three brothers. When he died, the right to the land was transferred to his two daughters. One of them, O, got married and lived in Migueles and Montevideo for a while until her second daughter was born, when the family moved back to the current farm. Meanwhile O's sister moved to Minas and now receives rent from her sister and brother-in-law.

Text box 4. Immigration and land inheritance (II).

The natural fertility of the Santa Lucía valley would have attracted agriculturalists to practise arable farming (Araújo 1912: 295)²⁴. The short distance to Minas, the provincial capital, as well as the development of British-owned railway and road systems, might

²³ Their names appear frequently in official documents in relation to land transactions (see Banco Hipotecario del Uruguay (n.d.) *Salidas fiscales* N° 16,17 and 20). Also, these *estancieros* figure as occupying prominent administrative positions in Minas (*Minas-Lavalleja* 1902). Finally, these landlords not only appear in texts but are also reflected in the landscape's toponymy. The case of Temístocles Ortiz is paradigmatic. There is a train station named after him in return for his donation of land to build the existing railroad. Near the station a mountain known as *Cerro de Ortiz* further evokes his memory.

²⁴ The official soil productivity index shows that the 13th District of Lavalleja has the highest indicator (i.e. 123) in the whole province (MAP/CONEAT 1979).

also have favoured the decision of tenants to settle in the area²⁵ (Alvarez Lenzi 1972). Train stations were the main points from which agricultural products were sent to either Montevideo or Minas, until roads were improved in the 1940s, though complaints about the costs and unreliability of the rail service were common. Passenger trains were also run. People from Minas were able to travel to and from Montevideo in only one day, though there is no reference to whether or not poorer rural dwellers benefited from this faster way of travelling. On the other hand, a network of dusty roads had been built throughout the area, sometimes following the traditional cattle and cart trails along the tops of the hills. Nevertheless, these roads were generally badly maintained, creating severe problems for transportation. For instance, in 1900, Machado sadly reported:

Communications between Minas and the rural areas are disrupted during the rainy season. It is necessary then to wait until overflow streams go back to their normal level. We do not have bridges or rafts or maintained tracks; we live at the mercy of the natural elements which still rule the operation of general life, amidst a wrongly defined 'civilisation' (Machado 1900: 226).

Despite practical difficulties, the area was filled with tenant smallholders between 1880 and 1950. Most families who arrived in southern Lavalleya were people of Spanish and Italian origin, or their descendants. Among the Spanish migrants, those who came from the Canary Islands seemed to be the majority, though recent studies argue that the traditional association between extensive crop-farming and *Canarios* should be understood as a complex relation of discriminatory ideologies and social labelling rather than a quantitative phenomenon (Foladori and Taks 1993). (See plate 2)

²⁵ The close relation between the town of Minas and the rural inhabitants of the 13th District seemed to be 'inherited' by the newly arrived tenants. When the province of Minas was created in 1837, the area of the so-called Solís District, the southern region, was left out of its jurisdiction. Part of it, the current 13th District, became part of the Province of Canelones. For the next 40 years, people would claim to go back under the administration of Minas's council. They argued that it was not convenient to travel to the capital of Canelones for bureaucratic

It is important at this stage to mention that there is a common image throughout the literature, derived from ambiguous 19th century observations, of *Chacareros Canarios* as being 'backward' or 'primitive' farmers. For instance, in 1858, an industrial entrepreneur described the situation of Uruguayan peasants in general and *Canarios* crop-farmers in particular, as the 'most sad occupation that can be imagined' (Robillard quoted in Berro 1975: 99). He added,

Although peasants, generally, do not seed more than one third of their farms, they neither collect hay nor tender any cattle. Many of them do not have even a cow, but one or two yokes of oxen that end up thin and tired, when not dead, during the winter [...] Peasants do not make either cheese or butter, and just a few of them raise pigs. (ibid.: 101)

At the end of the 19th century, other intellectuals expressed their animosity towards *Canarios* peasants who did not satisfy the expectations of those who supported their immigration to colonise the country. For instance, whilst defending native colonisation, Cluzeau Mortet wrote in 1878 that:

Truly, the son of this country does not show a strong inclination towards agricultural works. Yet, as soon as he realises that there is no other alternative, he will easily submit himself to this new condition. Moreover, he would learn as quickly as the foreign peasants who come to settle here; indeed, we haven't seen any new system or improvement in our agriculture due to the vast numbers of Canary migrants who have recently arrived, have we? [...] However, they have been welcomed, and their co-nationals give each of them \$2000 as a grant. They do find land to work. The *criollo* population doesn't! The latter is rejected both by locals and foreigners due to natives' sad and unfair bad reputation. (Cluzeau Mortet [1878], quoted in Barrán y Nahum 1967: 246-7)

Moreover, it seems that the best-known educational reformer during the modernisation period did not have a good opinion of the *Canarios'* farming skills, either:

Would you like your children to be employed in agriculture? Would you like to see them exploiting our soils' wealth? You should not expect them to continue with *Canarios'* agriculture. The latter means wrong ploughing, worst seeding, and to let the weather and soil to do the rest until the mares will be brought in

procedures whilst they were, at most, 34 km away from Minas. Finally, the territory and inhabitants returned to their previous status (Barrios Pintos 1983: 24).

for the threshing. All of these assuming that the rain would not come first to spoil the harvest on the standing heaps. On the contrary, all the most recent advances of the modern industry have to be applied in our agriculture: machines for ploughing, seeding, mowing, laying grain for threshing, and winnowing. In short, machines instead of men. [...] People should learn those natural sciences needed for the daily job of an intelligent farmer. (J.P.Varela [circa 1874], quoted in Wettstein 1967: 121-2)

Such statements about *Canarios* working practices continued to be made throughout most of the 20th century. For instance, Griffin (1973) argued that the cultural origin of the first settlers and their progeny is the cause of the primitive nature of their production techniques, and therefore their permanent poverty. Furthermore, comparisons are commonly made in the literature between *chacareros* and Central European migrants (i.e. Swiss and German farmers) who settled in the southwest of Uruguay. Generally, the latter are described as good workers, progressive, and open-minded, whereas the *chacareros canarios* are resistant to changes, primitive and individualistic (Vidart 1969: 32). I do not deny that ‘*Canarios* farmers’ have not fallen short of the mixed farming ideal imagined by various politicians and intellectuals until the end of the 20th century. Yet factors other than their supposed cultural traits must be taken into account in order to explain their particular social development.

During the first decades after their arrival, tenant farmers moved from one plot to another, breaking new lands with their ploughs, as soon as the cultivated land was exhausted by permanent light tilling and the monoculture of wheat and maize without fertilisation²⁶ (see plate 3). Changes in rent value seemed to have reinforced mobility. Nevertheless, the availability of new and ‘virgin’ (empty and fertile) land kept families in the area, as older farmers remember. Indeed, in many cases, actual barns are still

roofed with 'portable' straw roofs that have survived several moves. Damiani (1990) has called this farming system 'ecosystemic harvesting' and characterised it as having a higher extraction rate of renewal by either man-made or natural means. Plottier and Notaro (1996) state that, historically, leaseholders in the south of the country used their lands more intensively than landowners and with less concern about soil conservation.

Progressively, families practised an increasingly diversified agriculture. They combined the growth of crops for the market (wheat, maize, linen and sunflower), horticulture for home consumption (e.g. beans, sweet potatoes) and the raising of small farm animals (poultry and pigs) both for their own consumption and for the market. It was also common to milk cows for household consumption. Furthermore, forestry was also practised on a small scale. Fruit trees grew in people's backyards and gardens. Fast-growing trees (e.g., *transparentes*) were planted next to the houses to provide shade for people and small animals. Also eucalyptus trees forming barriers emerged in the landscape to shelter cattle from the sun and strong winds, and to provide households with firewood and building materials.

The production and commercialisation of agricultural produce was dependent on the activities of warehouse keepers [*almaceneros*] and mill owners, who acted as moneylenders and almost monopoly buyers of harvests (Camou 1994; see Pappas 1992 for a similar Brazilian case). In Villa del Rosario, known in 1900, among other names, as *Paraje Solís*, there were at least five warehouses and general stores (Machado 1900). By 1908, a Catholic chapel was built next to one of those shops (plate 5). There was

²⁶ Land productivity was very high. According to Araújo (1913), during the 1906-7 wheat harvest, the Province of Minas showed the highest average rate per hectare in the whole country (907kg/hectare, the national average being 740 kg/hectare).

also a *tahona* or roasted maize mill to produce maize flour [*gofio*], a traditional Canary product. Its owner also provided agricultural services with his threshing machines, at least after 1910 (plate 6). I would suggest that the presence of commerce and small family industries, with clear connections between them, were the economic basis for the existence of the Villa del Rosario locale. An indicator might be that the first macadamised road was constructed between an *almacén* and the wheat mill, even before the local council built the main road between Villa del Rosario and Ortiz Train Station in 1937. Furthermore, it seems that the current rural school was erected on a piece of land donated by the main warehouse keeper²⁷. Indeed, these examples show that a commercial middle class led the transformation of the landscape.

During this period of extensive crop farming under the system of leasing land, what I would call the wheat cycle, the relations between cattle producers and arable farmers were not always easy. Besides the high rent the latter had to pay, one permanent source of dispute was the damage to crop fields brought about by straying cattle. *Estancias* were fenced along their boundary, but landlords did not fence the small plots rented to farmers for arable farming. On the other hand, tenants would not have invested money and labour in fencing their plots so long as tenancy contracts were issued, if at all, for a short-time (normally 3 years). Many people remember how difficult it was to look after

²⁷ One of the most important businesses, which is still in place, seemed to be *Almacén y comercio F.* According to family testimonies, they used to buy the entire farmers' harvest and sell it in Montevideo. Some informants pointed out that the F. family, who came to the area as poor colonists, was able to buy land and lease it to other farmers who would have paid their rent with their harvests. On the other hand, the general store sold agricultural tools, machinery, petrol, clothes, and any kind of manufactured items brought from wholesale shops in the capital of the country. The post-office and the only telephone were located in this general store. In general, commercial transactions between farmers and *almacenes* did not involve the use of money, but rather a kind of barter was common. Farmers received in advance consumer goods and the means of production for their next harvested grain. As an informant pointed out, '*We never asked how much the price of our grains was*'. Also, a couple of sacks of flour to make pasta and bread throughout the year were part of their payment.

animals. At that time, children and women herded oxen, pigs and their few milch cows²⁸. Morosoli²⁹ describes their situation critically in the late 1940s:

Canario families live with astonished frugality [...] The children of these lineages are leaving the place, and every official work offering a basic wage depopulates the *chacras*. Truly, the latter are clay pits where elders vegetate and women and children work hard; when women and kids are not in the furrows seeding or breaking the land behind their ploughs, they are tending pigs, falling down with their wooden shoes between hardened *camellones*³⁰. Indeed, they are making up for the lack of wire-fences the landlord doesn't build and a tenant won't build by himself. (Morosoli 1971: 38)

To sum up, during the so-called 'modernisation period', natural prairies were replaced by crop-fields (mainly wheat plantations). The development of small and medium agricultural enterprises pushed the of livestock ranches to the north of the province. Animal herding in the south of the province appeared to be associated with agriculture and domestic consumption rather than to form the basis of people's livelihoods. The settlement of family farms increased due to direct or indirect European immigration, helped by official policies oriented towards the expansion of mixed production and permanent settlement in rural areas. Nevertheless, the economic and social conditions for working the land were far from ideal and smallholders experienced tough times due to the lack of efficient agricultural tools and practices and the consolidation of a social structure that worked against their interests as direct producers in a rather mercantile context. The use of particular techniques negatively affected soil fertility, when it did not cause its depletion accompanied by surface water pollution. However, families carried on a strategy of permanent mobility, breaking new lands, which allowed them to

²⁸ This point often came up during interviews with middle aged informants speaking on current children's education. In comparison with their children, adults had to spend more working time in the farms and in many cases, especially men, could only attend school irregularly or otherwise had to give it up altogether.

²⁹ J.J. Morosoli (1899-1957) lived in Minas all his life. He was a famous *costumbrista* writer in Uruguay, portraying everyday life and the prevailing customs among rural dwellers during the 1930-40s.

³⁰ These are high ridges of ground on which to deposit the seed.

stay in the area. Moreover, the monetary costs of their productive investments (e.g. seeds and agricultural tools) and living expenses were low, and left families relatively untouched by strong market changes. Hence, their practical losses during adverse climatic conditions did not prevent them from starting a new production cycle, helped in many instances by local traders to whom farmers became tied financially. On the other hand, family farmers did not of their own accord develop any collective strategy to break with their complex dependencies on other social agents. Individual needs found channels of expression, and sometimes solutions, through a political system of traditional parties, with local leaders flexible enough to adapt their actions and discourses to new demands. In short, the future generation of smallholders in Villa del Rosario will inherit an impoverished land, relative to the predominant form of production, and a social situation of increasing dependency on other economic and political agents that might limit their choices for change. Needless to say, they will also inherit a social stigma as bad farmers, lazy and slow people, conservative and resistant to externally proposed changes, not to mention the idea of the *Canarios*' submission to Nature's forces. (See chapter 5).

The Golden Age: 'The Green Revolution' and State protectionism (1950-1960)

A timid land reform

From the late 1940s on, some tenants began to buy their lands. Thanks to official policies aimed at developing a kind of agrarian reform to defend smallholders in general and agriculturalists and mixed farmers in particular, many farmers were able to afford official low interest credits to buy land. The elderly refer to this period as the 'golden age' in economic and social terms. *Neo-batllismo* (1942-53), a direct

descendent of the political ideology of *Batllismo*, was a political force that defended practically and ideologically the rights of 'progressive' smallholders against the *latifundio* (Olveyra 1989). It was in this period that family farming reached its peak (Porcile and Sosa 1984). Two important official decisions were fundamental to fixing family farms to their lands. Firstly, governments controlled market prices for agricultural products in general, and crops in particular, ensuring that farms would secure a minimum cash income to reproduce, and often even enlarge, their assets. Secondly, a rural development office was created in the existent National Housing Bank to expropriate and distribute official land among poorer farmers. Since 1948, the latter became the autonomous National Colonisation Institute [*Instituto Nacional de Colonización*, from now on INC]. Its main goal was the improvement of tenancy conditions among smallholders in comparison to the predominant short-term contracts offered by private landlords. The Institute's means to achieve this goal were a better administration and monitoring of existing official 'colonies', and an increase in the quantity of state owned land to be distributed among colonists [*colonos*]. A significant consequence of this land regime promoted by the INC was that once a farmer had become a *colono*, he/she and his/her heirs might have the certainty of rights to possess the land, as long as the use of the plot met certain technical standards³¹. These norms were established, mainly, to avoid non-agricultural land use and the depletion of natural resources (i.e. soil erosion), but also to maintain the viability of the rural family 'enterprise', for instance by limiting the subdivision of farms beyond a certain minimum threshold defined according to technical and economic standards assessed by the INC's experts (Instituto Nacional de Colonización 1989, Articles 70-71). Hence,

³¹ Even when a farmer bought land from the INC, as he was encouraged to do by the Law of Colonisation, the farm would remain under the Institute's regulation and scrutiny for ten years after the title was issued.

both men and women could inherit the *colono* status and correspondent rights and obligations. Contrary to previous social agreements, working the land in specific ways earned one tenancy and/or ownership of it.

To be sure, the existence of two INC colonies in Villa del Rosario helps to explain, at least partially, the permanence of many smallholders. The first colony was established in 1946 (19 plots) and the other in 1975 (17 plots)³². Altogether, they total 1,206 hectares. Analysed data show that during the last two decades, the eldest colony has passed almost entirely into the ownership of private individuals, mostly the descendants of the first colonists, though newcomers have acquired land in the colony, too. On the other hand, the newest colony was still leasing land in 1998. In both cases, however, a trend towards land concentration is apparent (see appendix B). Local people recognise its historical importance for the general development of farming and the fixing of many farmers to their lands, though global evaluations of the Institute's policies and practices have been rather negative (Errea, Cayssials, and Panario 1987: 95). For the purpose of this chapter, the point is that many rural producers and their families obtained access to land and other assets through the direct mediation of the State, which in turn established norms that have, at least in principle, constrained the way components of the environment should be transformed and managed³³.

State protectionism and sugar-beet agribusiness

³² In a report made in 1975 to assess the future redistribution of plots in the recently acquired land, it is shown that half of the applicants owned, at least, another piece of land in the area. Therefore, the trend to private ownership was already present among tenants (Ferrari 1975).

³³ At the end of 1999, I received a letter from one of the families I stayed with during my fieldwork, informing me that there was a meeting of a group of locals with INC authorities. The former wanted the latter to assess the current state of the colonies, aiming, among other things, to redistribute those lands that were not 'properly worked' among new applicants, with a certain preference for associated farmers organised in groups or working teams. It is a clear example of how human social relations mediate the relation of people with non-human components of their environment.

In 1988, the sugar-beet processing plant (RAUSA) in the nearby town of Montes closed down. This symbolised the end of policies of State protectionism of crop farming in Southern Uruguay dating from the beginning of the 20th century. The installation of the sugar-beet processing plant in 1944 was part of the import substitution model implemented by national 'developmentalist' governments. For the next four decades, the production and manufacture of sugar affected the livelihoods and environments of thousands of small family farms in its catchment area, including Villa del Rosario (Sosa 1982).

As a consequence of the expansion of the sugar industry, an early Green Revolution took place within farms. Short and medium term credit became available to buy tractors, petrol, fertiliser and high-performance seeds, generally provided by agribusinesses with official subsidies. On the other hand, in addition to the three hectares on average devoted to sugar beet, land use on farms continued to be oriented to extensive crop farming, mainly of wheat and maize, using more traditional techniques. The combination of this dual farming system not only signified an improvement in family farms' incomes but also the further degradation of soils due to the lack of crop rotation and tilling techniques intended to secure the growth of crops rather than integral soil management and conservation. The situation was officially recognised in the late 1960s (Morelli 1993), though measures encouraging conservation practices were powerless in the face of short-term interests, and 'ignorance' according to farmers' reflection, on the part of agribusiness and farmers alike.

During this period of 'happiness', most farmers were organised in Rural Development Associations [*Sociedades de Fomento Rural*], which had clear links with political

parties, where farmers had access to agricultural inputs and technical advice. Also, trade unions emerged among sugar-beet producers, though their activities and voices became co-opted by the industrial management (Latorre 1986: 6). Locales experienced a dynamic social and cultural life, centred on rural schools, dancing saloons, and in the case of Villa del Rosario, the local Catholic chapel (Gómez 1970). Both local rural associations and schools carried out educational projects to diversify farms' production and encouraged the mechanisation of agriculture³⁴. They also transmitted information from other parts of the world, and stressed the importance of co-operation between family farmers. Technical and social innovation, however, was severely constrained by its feasibility on farms, and by political interests, ideological individualism and inter-generational conflicts. In short, the transformation of the environment during the Golden Age shows an intensification of agriculture, without long-term planning, and the multiplication of *chacras* thanks to official incentives to keep rural dwellers in place (i.e. subsidies for agricultural inputs and guaranteed minimum prices for the main products of farms). Moreover, interpersonal contacts multiplied due to the existence of new or renewed collective institutions associated with agricultural production, education, religion, politics and leisure. Probably, the deterioration of the soil and other resources (e.g. underground water) was not perceived as such due to the improvement of human social life. The next generation would experience a reverse process.

³⁴ In the early 1950s, pupils of Villa del Rosario's rural school edited a newsletter with articles on new farming techniques and management, travelling chronicles, and youngsters' poetry (see Granjeritos 1951). According to people present at the time, its main function was to transmit what youngsters had learnt at school to their parents, attempting to induce changes in farms' activities.

Rural stagnation, neo-liberal policies and restructure of the locality (1970-1990s)

The end of crop-farming and the crisis of family households

Since the mid 1950s, the country's general economic situation deteriorated, mainly as a consequence of the decreasing prices of raw materials and the so-called 'commodities' in international markets, and decreasing consumption in the internal market. The effect on the agricultural sector has been defined as 'dynamic stagnation', which means a generalised economic crisis in the traditional livestock and agricultural sectors, though with a few highly developed new sub-sectors (e.g. rice, dairy, and citrus) (Kmaid and Riella 1992). The decreasing political influence of most rural producers upon national macro-policies heralded the consolidation of 'post-agrarian Uruguay' (Hoetink 1997). Neo-liberal policies began to be implemented by the late 1950s, monitored by the IMF and World Bank, with negative effects on family farms³⁵. The application of neo-liberalism became stronger after the military coup in 1973, when the military dictatorship repressed the opposition whose origins lay in civil society. The sugar beet industry declined with the withdrawal of State subsidies. Furthermore, the State freed the price of wheat and other crops at the same time as larger farms on more fertile soils in the East Littoral of the country began to compete with crop farming in the south (CIEDUR 1983). The most apparent result was that from the 1970s on, migration to towns speeded up (Damiani 1990). Many of those who remained in the rural area

³⁵ For instance, in 1972 sugar beet producers experienced a severe crisis because there were no credits available to intensify its growth but instead the government allowed the importation of the beet from abroad (Martínez 1972: 71-2)

developed a subsistence-based household strategy³⁶ or alternated farming and temporary waged work. Also, livestock herding began to supersede crop farming (CIEDUR 1983). Moreover, since then, there has been a growing concentration of land in fewer hands, reversing the modest land reform implemented a couple of decades before. As a man in his eighties put it: *'The land is becoming campo'³⁷ again, as it was when my parents arrived at the turn of the century'.*

By the end of the dictatorship in 1985, the family farm sector was in severe crisis throughout the whole country. The northeast of the Canelones region in particular was identified as the main pocket of poverty in the south (see figure 3), and hence a *Plan de reconversión* was implemented with loans from the Inter-American Development Bank (*BID* in Spanish), managed by official and private rural agencies. Livestock production systems based on artificial and 'improved' pastures, as well as intensive horticulture, were encouraged as alternatives to extensive crop farming.

³⁶ Porcile and Sosa (1984) pointed out: 'During the 1980s, there appeared an unknown phenomenon in the old Uruguay. [Family] producers became almost excluded from markets and retreated to subsistence agriculture. The producer restructured his farm aiming just to feed his family. The reduction of a farm's income, to a level even lower than an urban waged worker's, led the youngsters to leave their farms and offer their labour in town' (Porcile and Sosa 1984: 49).

³⁷ Uncultivated fields in local use.

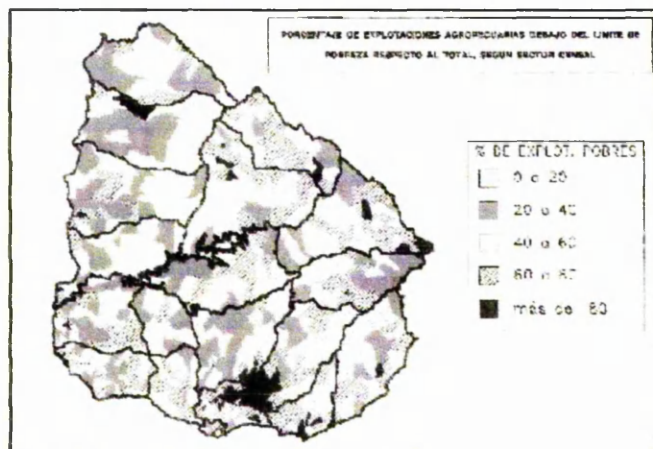


Figure 3. Rural poverty in Uruguay in 1990.

Note: The darkest areas represent the poorest rural regions with more than 80% of farms below the poverty line.

Source: Based on Dirección de Censos y Encuestas (1994).

The once extended yellow fields of wheat smoothly changed to low greenish grazing fields and forage crops. Small ground water reservoirs emerged in the landscape as cattle herds multiplied. Large scale forestry of fast growing species (e.g. eucalypti) also received official support, though small farmers were not able to gain any economic benefit from the forestry plan (Damiani 1990). International, national and municipal organisations as well as non-governmental organisations were involved in the reconversion process, in an attempt to integrate rural enterprises, especially small and medium farms, into the new dominant economic and social model (see Key 1997 for the Chilean case).

A similar situation was experienced in Villa del Rosario, though the southwest of Lavalleja was only marginally identified as part of the targeted reconversion region, despite its common historical and economic background. People embarked on the challenge of productive reconversion. Indeed, they had no realistic alternative other than moving out of agriculture, as many however did, as shown by existing

demographic statistics (see table 2). Also apparent is the ageing of the remaining rural population (see chart in appendix C).

Year	Population	Growth rate (%)
1985	2846	
1996	1951	-31,4

Table 2. Evolution of the population in the 13th District, province of Lavalleja
Source: Adapted from INE 1997a: 4.

Many family farms in Villa del Rosario began to sell fresh milk and home-made cheese to Minas, among other new productive activities (e.g. making tomato sauce). Although, at first, this helped them to have a daily cash flow, the relations with intermediaries deteriorated along with the price they received for their products. Then, a group of farmers and local technicians had the idea of sending milk to the main national Dairy Industry, *Conaprole*³⁸. It must be mentioned that the Dairy Co-op was already collecting milk from many smallholders in the neighbouring province of Canelones, as part of the project of changing farms' economic orientation. Indeed, according to experts, dairy farming appeared at that time to be almost the only feasible production system for smallholders (Piñeiro 1991). To reach such a radical conclusion, scholars analysed a combination of variables like existing technology, soil degradation and potential land-use, the use of family labour and future integration with an agribusiness company that

³⁸ *Cooperativa Nacional de Productores de Leche* [National Co-operative of Milk Producers]. By 1999, Conaprole's 12 processing plants received more than 70% of the total milk production in the country (circa 800 million litres a year), from around 3,000 remittants. The Co-op's agriculture basis shows a great heterogeneity in terms of the scale of farms, organisation of labour, means of production and economic feasibility. Nevertheless, as an original case in the regional context, the majority of the Co-op's members are still small and medium sized farms (less than 400 hectares) where family labour is prominent. However, more than a thousand small dairy farms went bankrupt over the last decade. On the other hand, large-scale farms have become more prominent and have greater influence in decision making. The voting system within the Co-op gives the right to vote according to the amount of quota received, which in turn depends on the scale and production capacity of the farm (Sosa 1986). It follows that wealthier entrepreneurs who run two, or even more dairy farms accumulate votes in the General Assembly, which takes the most important decisions in the Co-op (Seragro 1999).

had historically defended the interests of poorer dairy farmers. On the other hand, the dairy industry, monopolised by *Conaprole* since its foundation in 1934-6 until the early 1990s, had experienced an expansion towards international markets since the mid 1970s (CINVE 1987). Despite the application of neo-liberal macro-economic policies in the agricultural sector, the production of milk by small-scale dairy farmers has continued to be indirectly subsidised by redistribution mechanisms within the Dairy Co-operative. Furthermore, State control over prices of so-called *leche cuota* (a portion of produced milk directly consumed, after pasteurisation, in the internal market) was maintained (Sosa 1986). Therefore, becoming a *Conaprole* member was, in the late 1980s, an attractive alternative for small and medium holders in Villa del Rosario. Moreover, during the 1990s, even large livestock ranches diversified their activities towards dairy farming in their attempt to secure a monthly income in the context of very uncertain market fluctuations in beef and wool prices.

Becoming modern dairy farmers

The first meetings between locals and the Co-op's authorities aimed to convince the latter that this new milk belt was worth developing. The provincial authorities and the National Milk Producers Association [*Asociación Nacional de Productores de Leche*, from now on ANPL] mediated in the conversations and negotiations. Local schools became places of debate between farmers, technicians and decision-makers. The mass media were also important in supporting the locals' choice. Finally, the Co-op agreed to collect their milk. Together with a relatively secure source of income and access to credits, *Conaprole* provided its new members with technical advice through young technicians, who operated as rural extensionists. The technological 'package'

transmitted included, among other things, improvement of the forage basis for cattle nutrition, cattle sanitary measures, and the mechanisation of agricultural work, including mechanical milking at a later stage (see chapter 3). The change from the first stage of dairy farming to a 'more developed' one, according to industrial requirements, is expressed in the common reflection: '*Pasamos de ordeñar vacas a hacer el tambo*' ['We shifted from milking cows to develop a dairy farm']³⁹. Moreover, almost every new remittant became a member of the ANPL, which has offered its associates not only indirect political representation in the running of the Co-op, but also many social benefits like cheaper health insurance, scholarships for higher education and regular technical and trade union information through the mass media.

Between 1987 and 1994, according to the company's database, 70 dairy farms in southwest Lavalleja joined *Conaprole*, and five working teams were organised. Many other farms continued to send milk and by-products to the provincial capital. Also, an artisan cheese farm industry emerged, with some producers even trading directly in Montevideo. Furthermore, in 1996 a former Co-op member installed a local dairy for cheese production, which collects milk on a regular basis from around 25 small farms. No doubt, the shift towards dairy farming has had a greater social impact than represented by existing statistics, which state that, in the 13th District, only 4.4% of farms had become market-oriented dairy farms in 1990 (Dirección de Censos y Encuestas 1994). Having said this, extensive beef livestock herding has increasingly

³⁹ In the past the word *tambo* referred to a stockyard where milk was sold. The term derives from the Quechuan 'tampu' or inn (Granada 1957: 212). In modern times it is used for both a dairy farm and/or a milking parlour. Besides the word *tambo*, the Uruguayan Spanish includes many words of Quechua origin, though with different meaning. To mention just a few examples commonly heard in rural areas: *quincha* (a roof made of straw); *cancha* (the fenced place where cattle is shown in a cattle market or any sport court); *chacra* (arable farm or plot); and *choclo* (fresh maize) (see Granada 1957).

been the dominant production system after the end of crop farming, though other experiences in intensive sheep herding and pig raising can also be observed.

Among *Conaprole*'s members, productivity rose rapidly, thanks to people's skills, efforts, economic and moral incentives, together with a well-adapted 'technological package', at least for the short and medium term⁴⁰. Soil erosion and depletion has been controlled with artificial pastures and better tilling techniques (Errea, Cayssials and Panario 1987: 90). Farms' incomes have increased, and some capitalisation of family farms has been evident in the observed number of tractors and tractor-drawn tools, the increasing size of herds, the extension of artificial pastures, the installation of milking machines and cooling tanks, and even land acquisition or leasing (see chapter 3 for further details).

In 1991, Uruguay became a full-member of the so-called *Mercosur* (Southern Cone Market), opening up a new political and economic context for the dairy sector to export their industrialised products to associated countries, mainly Brazil (Hernández and Pereira 1994). Dairy production continued its steady growth, though opinions about the future of the poorer dairy farmers became more pessimistic (Piñeiro 1996). Furthermore, in the mid 1990s, the trend towards an opposite relation between the price of milk and that of agricultural inputs (e.g. petrol) and living expenses—already foreseen during the 1980s (Gómez Miller 1996: 227)—became apparent for Villa del

⁴⁰ In 1991, a report from one of the working teams in the area, called 'Unidad', stated: 'In 1986, five producers started to send milk to *Conaprole*; all the milk was collected in a horse-driven cart to be taken to a main road. (...) In only five years, the area of artificial pasture quadrupled, fodder reserves increased tenfold and production by 650%. (...) We all began milking manually; nowadays just a few do not have milking machines. (...) Our objectives are to strengthen our group co-operation and the co-ordination between groups, for instance by sharing the management of rearing fields. We are aware that the only alternative for small farmers is to further increase our unity' (Grupos lecheros 1991: 12)

Rosario's dairy farmers. Therefore, people were obliged to produce more and more, which entailed increasing indebtedness to pay for their growing and changing production and reproduction needs. Moreover, the reduced area of farms has been one of the main constraints. Yet, the chances to extend them are minimal due to the increase in land prices in the area (see chapter 4).

To complete a pessimistic scenario, in the late 1990s, the Brazilian financial crisis severely affected exports of Uruguayan milk by-products. Subsequently, dairy farmers have received the lowest price for their milk ever. The dairy industry crisis has meant conflicts between the Co-op's authorities, dairy farmers and industrial workers (Seragro 1999: 19). It accelerated internal plans to change the character of the Co-op towards a more capitalist agribusiness⁴¹. Nevertheless, according to recent reports, small family dairy farmers seem to be the least affected by the crisis, because the so-called *leche cuota* that represents the larger percentage of their remittance is still subsidised⁴². Moreover, their medium-term investments, hence debts, have been lower than in medium and larger farms. Having said this, what in the beginning of the *reconversión*

⁴¹ At the time of writing, a new law has been approved by the National Parliament to convert the Co-op to a stock company and to break down the legal relation between the company and the state. According to some news reports the new status of the Dairy company would benefit a small group of very large enterprises whilst reducing the influence of the small and medium producers on decision making. Moreover, there are many observers who foresee the irreversible disappearance of most of the poorest Co-op members once the new law would be put in practice (Falco 2000). Writing on the situation of those Dutch farmers who worked on contract to a massive cooperative at the end of the 1980s, Noske pointed out: 'The term "cooperative" has a nice democratic ring to it, but in reality management interests often overshadow farmer interests' (1989: 25). In my case study, the content of the term is still under negotiation and social struggle, though the last events showed a certain imbalance in favour of 'management' and richer owners.

⁴² There are two 'types' of milk submitted by dairy farmers to the Dairy Co-op. The 'quota milk' is an institution as old as the Co-op. It is a minimum amount of milk per dairy farm for which the market price is established by the government, intending to ensure the availability of fresh milk for urban consumers. The price is calculated taking into account the production costs of an ideal average dairy farm. Therefore, it works as a redistribution mechanism within the Co-op in favour of the smaller enterprises. The rest of the submitted milk is called 'industrial milk' and its price is regulated by the supply and demand mechanisms of the national market.

was felt as a kind of safeguard is nowadays seen as an uncertain future, to say the least. This is a feeling based not only on official statistics and discourses showing increasing difficulties (Vaillant 1998), but also on the view of neighbours who have decided to minimise their milk production, or even quit dairy farming altogether. This feeling seems to have encouraged many dairy farmers of Villa del Rosario to join the demonstration against the current government's policy, organised by different rural associations in April 1999. According to press reports, it was the most massive political demonstration of rural producers in national history, though it did not achieve its announced goals (*En Perspectiva* 1999).

To sum up, the physical environment in Villa del Rosario has been profoundly transformed in the last twenty years. Cattle herds became again, as they were until the late 19th century, a significant living force in the shaping of the landscape. However, human agency has now a more significant role in the transformation of plants, animals, and other environmental components than ever before, even in those plots where cattle are raised on regenerated natural pastures [*campo bruto*]. Indeed, it seems that with the intensification of agriculture, there has been a speeding up in the transformation of the landscape. The intensification of agriculture and livestock production has been associated with the increasing use of scientific knowledge in practical activities. Developments in agronomic and animal sciences have led to new working techniques, the growth of selected plants and the rearing of selected domestic animals. This, in turn, has opened up new environmental affordances. Indeed, as I shall show later (see chapter 4), what was in principle considered as a negative legacy from the sugar-beet stage (e.g. uncontrolled chemical fertilisation) was turned into the possibility of cultivating artificial pastures. On the other hand, human social life has changed too. Indeed the connections between farms and industry, so fundamental to an understanding of the

actual relation of dairy farmers with biotic and abiotic components of the environments, might be seen partially as a continuation of previous experiences, i.e. in sugar-beet production. However, the institutional history of the main Dairy Co-operative, with its intimate relation with the State as a supportive and controlling agent, gives a particular content to the dependency of local farmers in the late 1990s on industrial goals in a context of regional integration and global markets. Finally, it must be stressed that dairy farmers do not act on their own in shaping their environment and their social life within it. Although my focus is on the experience of dairy farmers, what their neighbours do or do not do (for example, in the field of industrial forestry) might have direct or indirect effects on their lives and performance. However, as recognised by most informants, the development of dairy farming has been a practical guide for other productive choices, not only in agricultural techniques and technologies, but also in recent attempts to develop new forms of partnership between individual farms. I shall explore these aspects later in this thesis (see chapter 3).

Conclusions

In this chapter, I have shown that the human transformation of the environment is not a unilateral process. Humans, oriented by collective and individual conscious goals, affect the relations between non-human organisms and the environment in complex ways. Conscious goals with their corresponding imagined effects may be achieved, at least partially, but they also involve unpredicted consequences. Both planned and unplanned results become the background to the ongoing process of further ecological metabolisms. On the other hand, the development and co-evolution of plants, animals and soils, to mention those elements I consider more important in this particular case study, have been affecting the possibilities for human sociality.

We have seen that in Villa del Rosario the humanisation of the landscape has been a continuous process. I use the concept of humanisation to refer to the way that peoples' activities and inter-personal arrangements come to exert a greater influence on future choices than do other living and non-living agencies. During the colonial period cattle reproduced freely, transforming the quality of the existing vegetation. Moreover, this was the basis for the reproduction of a social system that allowed the collective appropriation of animals by a tiny group of mobile hunters. Ecological crisis, represented by overgrazing and the reduction of herds, and the emergence of new social relations of production, led to the demarcation of private lands. The latter permitted livestock production but constrained access to natural wealth for many, if not the majority, of rural dwellers and potential farmers. Mobility in the prairies was limited for both domestic animals and humans. Soon after the demarcation of land ownership, agriculture as a means of making a livelihood became more and more significant and replaced extensive livestock production in the southern part of the province. European migrants and their descendants increased the population of the area and a new division of labour arose between agriculturalists and livestock ranchers. Despite actual studies that show that the physical environment, including climatic conditions, is not objectively suitable for crop farming, thousands of small family farms directed their efforts to growing wheat and other crops. With their activities and choices, local farmers changed the landscape on and under the ground. Cultivation involved more human labour and human traces emerged rapidly in comparison with previous periods. The development of roads, railways, and buildings to house new industrial, commercial, educational, religious and recreational activities went hand in hand with the expansion of agriculture and mixed farming carried out by small and medium holders. The role of

the State in enhancing these processes should not be underestimated (Solari 1958: 414), though in local terms it acted by accompanying private initiatives rather than planning a particular form of territoriality. In the second half of the 20th century, the relations between industry and agriculture have been more directly organised. The results are experienced not only in the incorporation of new industrial products into agriculture but also in the guiding effect of industrial goals on the rhythms of farming, and in farmers' conscious choices and practical transformations of the environment. These goals have also affected the development of social networks, expanding interpersonal relations beyond the boundaries of the locale (e.g., in regional and national farmers' associations). The recent shift towards livestock production has meant that domestic animals are increasingly co-operating with humans in the shaping of the environment, as a result of both animals' direct agency within it and the new practical measures taken by their owners to dominate and protect them.

To conclude, human agency has become the fundamental living force in shaping ecological relations have been shaped in Villa del Rosario. I do not deny the role played by other living and non-living entities in transforming themselves and consequently human life. Yet I would suggest that the social organisation and practical activities produced and reproduced by farmers, workers, technicians, politicians and so forth, for the achievement of their conscious and unconscious goals, have gained predominance in guiding, though never completely, the operations of those other forces. In the following chapters of this thesis I will further explore the changes brought about by dairy farming in the transformation of people's relations with their physical surroundings, other living species and con-specifics, as well as dairy farmers' subjectivity.



Plate 1. The cathedral of Minas, heritage of the colonial era.



Plate 2. Descendants of the first Canary farmers.



Plate 3. Manual maize harvesting.



Plate 4. The province's heraldic shield.

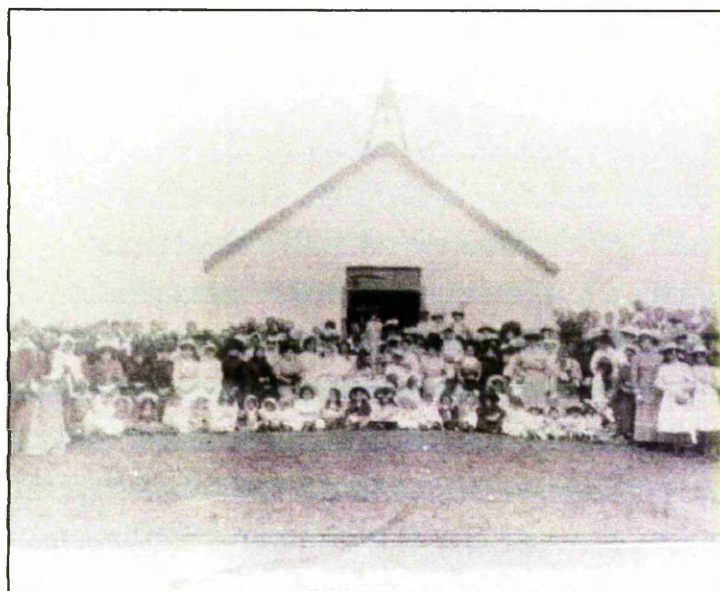


Plate 5. The chapel of Villa del Rosario in the day of the patron saint, ca. 1920.

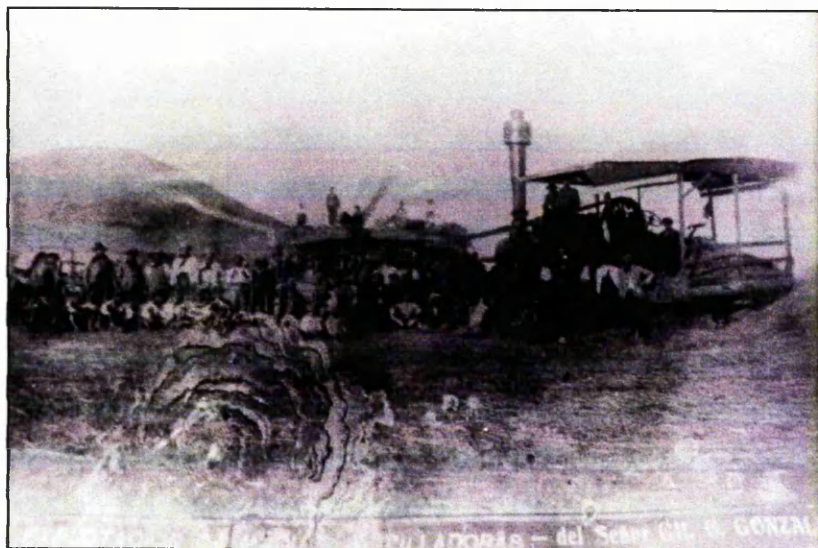


Plate 6. The steam revolution in agriculture, 1910.

Chapter 3. The form of production in dairy farming: technology and the organisation of labour for the production of milk.

General Introduction

This chapter is intended, first and foremost, to present empirical data on the way dairy farming is conducted in Villa del Rosario. However, despite its main descriptive goal, there is a theoretical concern underlying my presentation, namely, the interface between technical processes and social relations of production. In other words, I attempt to describe not just the 'content' of the process of producing milk, but also the current social 'form' of the labour process, and their mutual constitution. Moreover, I shall focus specifically on the relations between the domain of technical change brought about by becoming dairy farmers and the domain of the correlating organisation of labour. I do not impose any *a priori* view of the determinant nature of any one domain or the other; rather, I attempt to analyse what influence they have on each other. However, for the sake of the analysis, I begin with the description of the technical domain and then move on to the relations between people, following Guyer's suggestion that,

[T]o look at technology [as an encultured instrumental tool] means asking the historical and comparative questions why technology has the characteristics it does, why it implies certain forms of labour organization and task sequencing, and which interests and conceptions are brought into play when changes are being developed, assimilated, or resisted (Guyer 1988: 254).

Surely, the organisation of labour is an object of study intimately related to technology production and use. In this sense, the case of family farmers who own or have access to their means of production (land, machinery, human labour, etc.) has been the focus of

have been debated in a theoretical framework centred on the process of the commodification (or commoditisation) of family labour. The commodification of human labour means that it is gradually but never totally disembedded from its social and cultural specificity. In other words, in the context of capitalist relations of production, human labour is intended to be transformed into a disembodied 'labour force' (Narotsky 1997: 86-91). For the purpose of my analysis, by commodified labour relations I mean the payment in money for another person's labour on a permanent or temporary basis that implies the right of the employer to the fruits of the productive activity carried out by that other person. Moreover, this labour relation is intended to secure maximum control over the way labour is performed, both in quantity and quality. On the other hand, non-commodified labour relations are those developed between (mainly) neighbours, friends or kin, which are not measured in monetary terms, but rather in terms of personal commitment to the renewal of relationships among people according to the satisfaction brought by their expected results. Reciprocal aid seems to be the most obvious example, though this kind of labour arrangement does not necessarily mean doing the same kind of job as the one done for you. As will become clear from my case study, between these two extremes, which are theoretical rather than empirical, lie various different forms of labour organisation and interpersonal arrangements.

I begin in the first part of the chapter with a description of the concrete technical processes involved in the production of milk, which are considered as the 'key-tasks' (Guyer 1988) in the household estates. Though I concentrate on dairying, I shall also present those activities not directly related to it, due to their significance for an understanding of the organisation of labour within and between households. In the

debates in the social sciences relating to the interface between technological change and rural livelihoods. An important issue of debate has been the apparent tension entailed in the development of concrete forms of production based in social relations of production other than waged-labour in a predominantly capitalist context of production (Friedmann 1978, 1980; Llambí 1988, 1990; Taussig 1982; Müller 1991; Papma 1992; Van der Ploeg 1996; Djurfeldt 1996; Narotsky 1997). For some authors, the organisation of labour among family farmers follows the peasant model based on kin-based networks (Silverman 1979). However, a significant difference found by many others is that, while peasants are thought to be relatively marginal to a capitalist economy, family farms are seen as fully integrated within it. Moreover, family farms show a very dynamic and sometimes enigmatic way of organising human labour such that kinship ties, if they are involved at all, play only a part in the whole process of the constitution of working relations (Pifheiro 1991). The realisation that family farmers are neither a marginal social group nor a historical relic of pre-capitalist regional developments, but rather a constituent part of the capitalist system (Friedmann 1978), has led to three key ideas. Firstly, the logic of capital, i.e. the drive to accumulate capital through the appropriation of surplus value, might be translated into empirical forms of labour/capital relations other than proletarianisation (Narotsky 1997: 217). Secondly, farming systems, including family farming, are heterogeneous and direct producers as agents have more opportunities than hitherto described to choose, though not in a fully arbitrary way, between different labour relations, according to their particular household reproduction strategy (Van der Ploeg 1996: 263, 281). Thirdly, labour arrangements among family households are not only the consequence of the encroachment, from outside, of dominant capitalist social relations of production, but rather the result of internal contradictions within the family household estate (Papma 1992: 246-7). These ideas

second part of the chapter I focus on the organisation of labour in a typical family dairy farm. I shall first explore the household reproduction cycle and the division of labour by gender and age within the units of production. Then I move on to the description and analysis of mutual aid between households. Finally, I discuss ideas on the engagement of farmers in commodified relations, both as employers and employees.

Part 1. The technical domain in the production of milk

In anthropological literature, dairy farming has been recently classified, though with important qualifications, as a particular type of pastoral system (see Galaty and Johnson 1990)⁴³. Unlike beef-cattle ranching, the raising of dairy cattle is intended mainly as a means to obtain milk rather than for consumption of the animal itself as food and/or as a source of other use-values (e.g. hides). Therefore, dairying is centred on the raising of female cattle rather than a sexually balanced herd.

The extraction of milk from cows involves a complex sequence of tasks which 'condense' twice a day in the milking parlour. While milk extraction seems to be the fundamental goal, it depends on the achievement of a range of interconnected secondary purposes, which in turn encompass a series of particular activities, as shown in table 3.

⁴³ The attempt of Galaty and Johnson (1990) to include modern dairying and ranching within the traditional definition of pastoralism is flawed because they base their analysis solely on the technical aspects of modern production rather than on the interconnections between social relations of production, technology and environment. Therefore, they fail to see that dairy farming is a particular sociotechnical variant within the capitalist mode of production rather than a variant of the traditional pastoral mode of production.

Purpose	Mediated activities
Maintenance of every milk cow as a living organism	(a) Provision of forage to continue cow's self-organised growth and development. (b) Protection of cows from predators and diseases.
Maintenance and sometimes enlargement of the milk herd	(a) Keeping a balance between herd size and available forage. (b) Protecting cows from predators and diseases. (c) Allowing the reproduction of milk cows. (d) Raising female calves and heifers. (e) Purchase of milk cows/heifers in the market.
Maximisation of the quantity and quality of milk per cow over its life-span	(a) Provision of forage to enhance the biological secretion of milk. (b) Securing continuous lactation under biological limitations. (c) Selective breeding. (d) Preventing and curing diseases. (e) Temporary or permanent elimination of low-performance cows from the milked herd. (f) Promoting the 'efficiency' of milking.

Table 3. Purposes and activities in milk production

What makes dairy farming such a complex production process is that most of its constituent activities must be carried out simultaneously and are highly interconnected by sequences of operations⁴⁴ performed by farmers or contracted workers day after day, without interruption. For analytical reasons, following Archetti (1975: 411), I shall group the various activities conducted by dairy farmers in three cycles: provision of forage, livestock management, and milking. Moreover, I thought it necessary to include other activities which are not directly related to the production of milk but are nevertheless relevant for understanding the technical and social realities of current dairy farms (e.g., bureaucratic tasks).

⁴⁴ I follow Sigaut (1994) in the definition of 'operation' as "someone doing something" when that something is the smallest material change that can be usefully observed' (1994: 425). Keller and Keller (1993: 135) would call it 'activity', keeping the term 'operation' for routinized actions.

Provision of forage

The feeding of cattle in Villa del Rosario is based on extensive grazing on gramineous and leguminous meadows, supplemented with hay reserves, crops and concentrates⁴⁵. Meadows are known locally as 'artificial pastures' [*praderas* or *praderas artificiales*], in contrast to 'natural pastures' [*campo*, *campo natural*, or *campo bruto*] which are not directly sown by farmers and are constituted by a sort of gramineous grass more affected by seasonal variations (MGA/CIDE 1967: 40). A meadow can yield forage for from two to four successive years, depending on weather conditions and general management. Besides its nutritional value for cattle raising, the growth of leguminous species is intended to conserve the soil's fertility by fixing the level of atmospheric nitrogen, and to prevent soil erosion from rain by keeping a relatively permanent and dense vegetal cover on the earth. Despite the increasing growth of artificial pastures, the use of natural pastures continues to be significant in almost every dairy farm. In many cases, these natural pastures are said to have been 'improved' [*campo mejorado*], in the sense that their short-term forage productivity has been raised by means of chemical fertilisation, the application of herbicides, and complementary sowing of leguminous species.

In addition to feeding based on pastures, feed crops are also grown. There are two groups of crops depending on the season: annual winter crops such as oats, ryegrass, and wheat; and annual summer crops, such as sorghum and/or maize. Cows might feed on these crops in the fields; otherwise the crops are harvested and held in stock as a reserve.

⁴⁵ Noske (1989: 26) calls this kind of extensive livestock raising 'pastoral industry', which implies a low labour input per unit of land.

Other reserves of forage come from hay from the meadow in the form of bales or rolls, which are stored in sheds or left on a paddock covered with a plastic bag. On the other hand, the technology of maize ensilage has been adopted rapidly in many dairy farms and has become the basis for winter feeding, when pastures have a lower nutritional value or cannot be grazed due to muddy ground. During my fieldwork, the ensilage of wet sorghum was introduced in a few prosperous farms in the place of maize silage (plate 9). Tradesmen and rural extensionists promoted sorghum as a cheaper and more resistant crop, though it has a lower nutritional value than maize. As I shall show later, adopting this new technology has new implications for the organisation of labour.

Finally, concentrates [*concentrado* or *ración*] are normally given to lactating cows throughout the year. They are made up of cereals, animal and vegetal proteins, minerals and vitamins. Unlike other sources of fodder, concentrates are always bought in the market.

Grass and crop seeds are either bought in the market or selected from previous harvests. With the increasing use of hybrid high-performance seeds, dairy farmers rely on what is offered by multinational corporations. Nevertheless, non-hybrid seeds [*variedades*] are available and some farmers grow them for future seeding on their own farms or to be commercialised⁴⁶. The Dairy Coop, *Conaprole*, organises an annual competition in co-ordination with the official National Institute for Agricultural Research (INIA in

Spanish), to evaluate the yields and cost of seeds. Then, the Co-op buys seeds from the winner and resells them to individual farmers through an associated company (PROLECO), which gives credits to be paid 'with milk', i.e. the costs of seeds and other goods are discounted in monthly instalments from a farm's remittance of milk.

The soil is fertilised with chemical inputs and cattle manure⁴⁷. Chemical fertilisers are bought in the market and *Conaprole*'s members might buy them using a similar system to that described above for seeds. Nevertheless, many farmers prefer to buy them from other warehouses in town when prices are lower, using the so-called '*crédito de la casa*' system, where the shopkeeper acts as an informal moneylender. Unlike the formal bank credit, this system is based more on interpersonal knowledge than on an objective evaluation of the enterprise's feasibility and farming efficiency.

The scientific analysis of soil morphology is rarely undertaken among family dairy farmers, though it has become more possible in recent years. Thus, to calculate the amount of fertiliser to be applied, people might rely on trial and error. On the other hand, financial constraints often lead to a reduction of the recommended amount of fertiliser per unit of land⁴⁸. Therefore, farmers might choose particular crops and paddocks where 'accurate' levels of fertiliser will be spread to ensure high yields

⁴⁶ There is a local farmers' association (*Sociedad de Fomento Rural Ortiz*) whose main 'service' is to provide clean and certified seeds to prevent the expansion of weeds. Furthermore, this organisation manages an international co-operation loan oriented to grow high-quality seeds, hence to reduce the dependency of farmers on corporations and intermediaries. However, for various reasons (e.g., distrust between farmers and elected directors) many dairy farmers are not using the association's services extensively.

⁴⁷ Some people use the word *guano* interchangeably for chemical fertilisers and animal manure. *Guano* is a Quechua word which refers to the deposited manure of birds in the central Pacific coast of Peru that was used in Europe as fertiliser until the 19th century.

⁴⁸ A commonly mentioned fertilisation measure is 150 kg of phosphated fertiliser per hectare when growing maize or a new meadow of lotus and clover.

(artificial meadows and maize plantations are normally chosen due to their significance for cattle feeding), while hoping for a more uncertain 'good luck' in others.

On the other hand, cattle manure enriches the soil while animals graze in the fields. Sometimes, animals are taken intentionally to selected paddocks, but natural manuring is not planned in strict terms. The accumulated dung in the milking parlour might be mechanically distributed on the fields on an irregular basis, mostly when a particular paddock is to be tilled for a new artificial meadow.

Livestock management

The predominant race of milk herds is the Friesian breed [*Holando*], especially the black and white type. One of the causes for this choice has been the main concern of dairy farmers and the dairy industry over the last decades to maximise the quantity of milk (Asociación Rural del Uruguay 1996: 187). Compared with other races, a Friesian cow yields a larger amount of milk in similar ecological conditions⁴⁹. On the other hand, since 1945 the National Friesian Breeding Association has bred an original Uruguayan Friesian race. Among other well-reputed features, the latter has evolved an udder system that affords more efficient mechanical milking (ibid. :188).

The size of the milk herd is related to, mainly, available forage and human labour. The average size of a milk herd among surveyed Co-op family farms was 29 animals, while the average number of lactating cows was 20 head during summer-autumn 1998. The amount of milk obtained is not directly dependent on the number of cows milked, but

rather on how they have been fed and the herd's sanitary conditions. A typical Co-op family dairy farm produces 130-200 litres/day of milk⁵⁰.

Activities included under the label of livestock management follow: (i) driving cattle to pastures, crop fields and drinkable water; (ii) breeding milk cows; (iii) sanitary treatments; (iv) purchase and selling of milk cows; and (v) record keeping.

Driving cattle to pastures, crop fields and drinkable water

Farmers drive their milk cows to different paddocks during the daytime on horseback or by foot. The main feeding pattern is to let them graze daily in meadows and crop-fields, if the latter are available. Otherwise, cattle might be driven between two or more pasture fields. The combined aims are to provide a balanced diet to cows (i.e. proteins and fibres), while avoiding overgrazing. The time allocated to the cattle drive will depend, among other factors, on the farm layout, location of paddocks, and weather conditions. In my sample, a single drive between two paddocks might vary from fifteen minutes to an hour.

Because pastures are enclosed with wire-fences, cows do not move freely between paddocks. Consequently, farmers do not need to stay with their cattle to herd them. However, if cows are driven to a very mature meadow of leguminous crops, especially in springtime, the farmer might stay close to the grazing herd and watch their behaviour

⁴⁹ The Holstein-Friesian breed originated in the Netherlands. It is black and white in colour and large in size. Holsteins give more milk than any other breed, though the average butterfat and protein content is lower than in the other four major breeds (Ayrshire, Brown Swiss, Guernsey, and Jersey) (Webb 1976: 425).

to act immediately if any cow gets *meteorismo* or *empaste*⁵¹. The increasing use of electric mobile fences to narrow the strip of grazed pastures, among other measures, seems to have reduced the risk of this disease.

It must be mentioned that different categories of cattle do graze separately. The best forage is given to lactating cows, pregnant dry cows and heifers. The rest of the herd is fed on poorer grass. Calves are generally separated from their mothers a couple of days after delivery, and kept tightened to a picket or fence, not too far from the milking parlour. They are fed twice a day firstly with the cow's colostrum for about ten days. Then milk is provided together with calves' special concentrates. Sometimes milk substitutes are given instead of fresh milk. During the first two months of life, they are kept separated from each other to avoid contagious diseases. Calves are encouraged to eat grass as soon as possible, and consequently they have to be moved daily a couple of meters from their previous location to find fresher plants.

Finally, cows need to drink a lot of water. If a natural source of water is available (e.g., a stream) the herd might be driven at least once a day to it. The same can be said about artificial water reservoirs. In some farms the design of paddocks allows free access of cows to artificial lakes [*tajamares*] or rivulets, by opening particular gates. Nevertheless, when a lactating herd arrives to the waiting yard in the milking parlour for milking, farmers do provide them with plenty of underground water. It is worth

⁵⁰ Among non-family farms, the situation is rather different. Summing up the milked cows of the five non-family farms I visited, the result is higher than the 19 family farms altogether: 450 and 342 respectively. The largest dairy farm of my sample produced 3,750 litres/day of milk from 200 lactating cows (autumn 1998).

mentioning that *Conaprole* is continuously asking for water quality tests. It is commonly recognised that many farms' water wells are polluted by infiltration of human dung from nearby household's cesspools⁵². Farmers have been recently encouraged to dig new and deeper artesian wells (40-60 metres deep) to avoid cesspool infiltration, and simultaneously to increase the amount of water available in the farm.

Breeding milk cows

The maintenance and increase of a farmer's dairy livestock depends, primarily, on the raising of female calves and heifers born in the "house", i.e. offspring of the farmer's own dairy cows. Not too long ago most farmers used a live bull to inseminate their cows. Nowadays, however, the practice of artificial insemination is widespread. The reasons for replacing the 'natural' method of breeding have been various, but the main ones are the resulting economic benefits and improvement of the herd's sanitary conditions⁵³. The Co-op has trained many farmers—especially young males—in artificial insemination. Otherwise, a veterinarian is called to inseminate cows and heifers. The frozen semen used has national and international origins. The Co-op shop is the main (though not exclusive) source of it for dairy farmers and veterinarians.

⁵¹ This is a potentially fatal disease resulting from the excessive production of gas in the cow's rumen, mainly due to excessive ingestion of leguminous herbs and low ingestion of fibres to neutralise the effect of the former. The symptom is the abnormal swelling of the cow's abdomen, and if discovered in time it can be healed with medicine, or, in extreme cases, by making a cut [*pinchar*] in the upper part of the left hip of the cow to release the accumulated gas.

⁵² Frequently, people's perception of the quality of drinking water relays in indirect effects. For instance, a woman farmer pointed out, '*As long as it is not manifested in the quality of milk we submit to the Dairy plant, we consider it to be good water*'. However, this practical assessment is not enough to convince the Co-op technicians when they ask for the test results to authorise a loan application.

The operation of insemination is performed in the farm using a stall in a milking parlour or driving the cow into an open-air wooden stall [*tubo*]. In the most sophisticated types of *tubo*, where the animal gets immobilised with its head caught in a clamp, only one person can perform the operation, though two or more workers are normally needed to help in driving and holding the cow. Frozen semen is stored in glass tubes in a thermal tank and it is defrosted in warm water for a couple of minutes before the operation of insemination is conducted.

The delivery of the cow's calves takes place in open fields, though farmers may bring a pregnant cow nearer the house if any problem is foreseen. If delivery problems arise, farmers might intervene, for instance, by trying to pull the calf out, or assisting the cow by putting forage and water in place. Having said this, troublesome deliveries are increasingly a matter for expert veterinarians. Thanks to their activity, the performance of caesarean sections and the use of pulling chains and forceps have become more common. Moreover, veterinarians are called for post-delivery health care like placenta retention or post-labour pain shock. Farmers may take the initiative by giving medicines to the animals based on previous experience, but they will call the veterinarian for a better diagnosis and further specific treatment⁵⁴.

Sanitary treatments

⁵³ The economic benefits, according to farmers and experts, come directly from not having to maintain the bull, and indirectly, by improving the productive capabilities of cows by using selected semen. The sanitary benefits come from eliminating sexually transmitted diseases and bodily injury to cows, mainly young heifers, when mounted by a heavy bull.

As mentioned above, farmers might conduct daily sanitary treatments, if necessary. However, among Co-op members, an expert veterinarian is responsible for at least an annual inspection of the milk herd⁵⁵. On the other hand, a veterinarian is called any time a farmer cannot deal with a health problem (e.g. a broken hoof)⁵⁶.

A permanent concern among farmers is the infection of cows' udders. The more frequent disease is *mastitis* which affects milk yield over and after the period of infection. Sub-clinical mastitis passes undetected by farmers until they receive the milk quality report from the dairy with a low rating. Farmers then try to detect the infected

⁵⁴ I should add that my observations of the importance of the veterinarian for breeding and calving might be biased and may not apply elsewhere in the country. In Villa del Rosario, Roberto, the young vet I referred to in chapter 1, is available almost 24 hours a day, every day of the week. He resides in Minas, but he spends most of his time in the village where he opened a veterinary shop in partnership with a local shopkeeper. His mobile phone is constantly ringing and, as I said before, he has developed great esteem among local people due to his commitment to help rural producers, even those who could hardly pay for his services. Despite the particularities of the case under study, my observations coincide with recent studies in showing the increasing importance of the vet in modern livestock production (Swabe 1997).

⁵⁵ The date for such health check is variable and, truly, not strictly kept. The temporal flexibility on compulsory sanitary check out might be, partially, the result of the success of past vaccination campaigns that eradicated main cattle diseases like aphthous fever and brucellosis. Nevertheless, in the last months of my fieldwork there was a strong epidemic of tuberculosis due apparently to farmers' negligence to continue vaccinating cows. Local veterinarians went to examine herds and when sick cows were found they had to be isolated and bled.

cow, if there is one⁵⁷. Otherwise, clinical mastitis manifests itself in visual symptoms and farmers look for them during milking. After mastitis has been detected in a cow, sanitary treatment with antibiotics follows, and its milk will not be sent to the dairy for a couple of weeks after the treatment has been completed to avoid the risk of milk refusal. The milk from a cow under antibiotic treatment is generally given to calves and other farm animals (e.g. pigs).

Purchase and selling of milk cows

Although I mentioned that the ideal of dairy farmers is to rely on the 'natural' reproductive capability of their own milk herd to maintain, or perhaps, increase their stock, this is not always possible. This is especially the case among smallholders, who may not produce enough forage to sustain a minimum number of dry cows (potentially mothers of female calves) to secure a yearly rotation of lactating cows. Moreover, other

⁵⁶ Not too long ago, local farmers would have called a *santiguador* [cross healer] to heal cattle from infected wounds [*bichera*]. Indeed, there are still a few people who are known to have this 'gift' which is not limited to treating animals but also applied to people and, sometimes, crops and trees. Having said that, nowadays the practice of *santiguados* is almost exclusively performed with people (e.g. against the devil eye). Somehow, the 'gifts' to deal with animals and crops have passed from local healers to scientifically informed veterinarians and agronomists respectively. I would suggest that in the recent past all living components of the environment seemed to share the same substance, though there might have been formal differences between them reflected, for instance, in the pronouncement of different healing verses. The point is that the healer worked with similar 'tools' to cope with problems both in the human and non-human domain; the healer might have embodied the unity of life. Nowadays, there is a trend to separate in practice humans from the rest of animals, though their common substance might still be recognised. The modern social division of labour evolved together with a more radical separation between the human and non-human domains. I believe that most farmers do still trust the 'traditional' methods, but the alternative is in place and it works as efficiently as the other, and moreover in many instances is enforced by the current form of production. One of the main differences between these alternatives might be the commodified character of the modern healing method, while the traditional one was more embedded in local sociality. No cash was needed to have access to it, but rather it required the building-up of a friendly relation with the healer as well as faith in his/her job.

unpredictable factors like the death of cows or the recurrent delivery of male calves might also lead to a reduction of the herd below a minimum threshold necessary to keep production going. If so, farmers would have to bring milk cows from outside the farm by buying or, more rarely, borrowing them. Cows are normally purchased from neighbours, local and regional specialised breeders or in cattle auctions [*ferias de ganado*].

Dairy farmers in Villa del Rosario do sell those cows which are culled, the so-called '*vacas de descarte*'. These are cows that do not bring enough monetary benefits to the farm. This category of cows includes animals that do not produce 'enough' milk over a certain period of time, a sick cow, and/or cows that behave constantly in ways that have a negative effect on human work or do direct material damage (e.g. knocking fences down whilst straying away). These cows might be sold in the neighbourhood to other dairy farmers or beef cattle growers; sometimes they are sold to merchants, who re-sell them to a slaughterhouse. Culled cows would rarely be offered in the cattle auction, consequently avoiding the payment of commissions and transportation costs. (See chapter 6, part 2, on dairy cows as commodities).

Record keeping

For the last decade, there has been a major emphasis among extensionists on the importance of dairy farmers writing down details of their herd in order to 'rationalise'

⁵⁷ Kinwill, Dodd and Neave (1977) define mastitis as 'inflammation of the udder caused by infection, injury, secretory malfunction or physiological change. The disease of economic importance is nearly always associated with microbial infection' (: 232). They also suggest that the indirect test of somatic cell counts in milk, carried on in dairy laboratories, might give negative results not caused by mastitis (ibid.: 236).

their management of livestock⁵⁸. This has meant taking notes of breeding dates, reproductive cycle events, and individual milk yield as well as other data. Although family farms still rely on members' tacit knowledge and memory, most of them do write down some details of individual cows in a notebook or on a calendar mainly in order to monitor reproduction cycles. This information is used for decision-making on individual cow management. For instance, if a dry cow has been inseminated twice or three times and does not become pregnant, the farmer might decide to try again or cull it. A farmer might memorise the whole sequence of events involved in artificial insemination. However, what seems to get lost in non-written recording is the exact period between events, which is of the greatest importance in evaluating reproduction cycles, according to the trend towards rationalisation of breeding practices in relation to seasonal availability of forage and the natural fluctuations of milk yields.

I believe there is among dairy farmers a trend towards the objectification of tacit knowledge. Certainly, this trend is reinforced with the growing size of the milk herd, as well as the technical and social division of labour on the farm. It is difficult to establish the size of the herd that a dairy farmer and his/her close co-workers can memorise in detail, but, according to my observations, the threshold might be around 30 dairy cows. On the other hand, keeping written records has become a must on large dairy farms, where milkers rotate on a regular basis and the decision making process is centralised to

⁵⁸ Recent social research on dairy farming in Uruguay has focused mainly on the question of 'enterprise management', where record keeping became a main variable of analysis (Marrero ca. 1995; FIDA/MGAP 1992; Piffeiro, Chiappe, and Graña 1996). Enterprise management has appeared among scholars as the most valid and seemingly exclusive way to find a solution to the shrinking of farms' economic viability (Grau and Paolino 1995). It is noteworthy that record keeping seems to have been a prime concern among dairy farmers since the advent of market-oriented farming. Fussell wrote for English dairying that, 'The farmer's natural interest in the "economic" cow, or rather in the best yield for the least food led not only to this interest in the average yield, but also to an interest in the yield of his own cows. He was encouraged to take

the owner of the farm or a representative who might not have permanent direct contact with animals⁵⁹. (See chapter 6, part 2).

Milking

Throughout the rest of this thesis, I shall explore the multiple meanings that revolve around the milking routine. I shall therefore confine my observations here to only the basic aspects of milking. Lactating cows are driven twice a day from the fields to the milking parlour, where milking is performed. Among Co-op members, cows are mechanically milked. Moreover, due to industrial requirements, the installation of bulk tanks on farms has become compulsory. Hitherto, only a few family dairy farms in Villa del Rosario had assembled closed milk circuits.

The milk is collected from the farm by an isothermal milk tanker that transports it to the processing plant which, in this case study, is a cheese dairy. In small dairy farms, with an average milk production of 150 litres per day, a tanker collects it every two days to save costs of transportation, while on larger farms there is a daily collection of milk.

Bureaucratic work

Dairy farmers, usually men, do allocate considerable time and effort to dealing with official and private institutions in financial matters. At least once a month, *Conaprole's*

records for his own benefit, and competitions began to be organised [since 1881] to stimulate recording' (Fussell 1966: 330).

⁵⁹ On many wealthier farms, administrators and farmers are using computers and special software to monitor their herd's 'performance'. Some of the cow's records include the name of the bulls that provided semen, calving date, ear number, and milk yield. For each calf is recorded its mother's name, sex, date of birth, and date of first grazing. The Co-op has implemented a couple of managerial projects ('Monitoring System for Dairy farms' and the 'National System of Experimental Stations') to centralise and analyse data provided by volunteer farmers, who, in turn, receive an individual report comparing their statistics with the national average.

members travel to town to receive their payment at the local State bank⁶⁰. In addition, applying for loans through the Co-op or other organisations means several journeys throughout the year to Montevideo, Minas or San Ramón, depending on what procedure they have to follow to get an authorisation to go to the bank. Furthermore, payment of various provincial and national taxes takes place in towns.

Recently, some bureaucratic procedures have been decentralised from towns to rural areas. Therefore, they can be carried out in Villa del Rosario itself. For instance, once a year a form has to be completed indicating the farm's livestock and the value of a holding for tax collection and statistical purposes. Farmers pick up a form and return it to the Police Station in the village. Moreover, electricity and telephone bills are now beginning to be paid in the village's telephone centre or in a local shop.

*Non-dairy production activities*⁶¹

The degree of specialisation of a family dairy farm is relative, if by that specialisation we mean that the *only* productive activities are related to the production of milk. Nevertheless, both objectively and subjectively, dairy farming is the main (pre)occupation of the great majority of the dairy farms I visited: 19 out of 24 considered dairy farming as the chief labour process and the main source of a farm's

⁶⁰ Most owners of non-family farms reside in Montevideo; therefore they will collect their payment in the country's capital.

income. However, rearing animals other than milk cows, growing plants other than forage crops and pastures, and many other activities which are not directly related to the production of milk, are not insignificant in terms of time-allocation and a farm's supplementary income. Table 4 shows non-dairy production activity, according to its destination, i.e. for own household consumption and/or markets.

Productive activity	Number of farms ^a	
	Subsistence	Market
Beef cattle herding	6	12
Sheep herding	5	5
Pig raising	12	4
Fowl rearing	20	2
Horticulture	14	3
Household manufacture	3	4
Others		9

Table 4. Non-dairy farming productive activities in dairy farms, according to destination

Note: ^a Where individual farms produce a particular product for both own consumption and the market, it appears in both columns.

Source: Fieldwork.

The above table shows that there is a great variety of production activities outside of dairy farming in the strict sense. Indeed, on many small dairy farms a conscious decision is made to diversify farm outputs to cope with uncertainties originating, mainly, from market forces (CINVE 1987: 114). Yet, diversification can also be found in large dairy farms, though here it is only rarely oriented to household consumption.

⁶¹ I am not including in this section the activities commonly regarded as 'reproduction of labour' such as cooking, cleaning the house and child rearing. I consider them productive in the broadest sense and no less important for the understanding of farmers' livelihood. Notwithstanding, I am focusing at this stage of my analysis on those activities more directly related with growing plants and livestock rather than in the raising of human beings. The distinction might look arbitrary and even contrary to my own thesis of the mutual development of humans and environments. Yet, for analytic clarity I keep the distinction pending the further development of my argument. Interestingly, farmers make the distinction themselves. They do not regard household chores as 'production' though they consider them as 'work', mainly women's work. Hopefully, I will be able to present a more integrated analysis when elaborating on the organisation of labour in the second part of the chapter.

The raising of beef cattle is, in part, a logical consequence of dairy farming. Having enough forage, male calves would be raised in the farm until they could be sold in the market as steers [*novillos*]. Indeed calves, like hogs, represent living savings boxes [*alcancías*] ready to be 'emptied' if necessary, a seemingly common practice among poorer Latin American farmers (see Gudeman and Rivera 1990: 86). There is a never ending debate between dairy farmers and extensionists about the economic viability of herding male calves. The latter try to convince the former that raising calves using milk is anti-economic, and consequently the only 'rational' way to raise them would be using milk supplements, concentrates and grass. Otherwise, according to extensionists, it would be better to kill them immediately after delivery⁶². However, in general, farmers see the raising of calves as a potential solution to unpredictable financial breakdowns. Moreover, buying special concentrates for calves' feed means spending money in the short-term, and is hence not desired⁶³. On the other hand, in those well-off farms I visited, beef cattle husbandry was also seen as a reward for the lower profitability of dairy farming. Indeed, the ecological basis for cattle feeding is the same. Therefore, on larger farms the landlord might shift the emphasis from dairy cattle to beef cattle, while always maintaining his assigned milk quota. Finally, it is worth noticing that on family farms, people do not consume their beef cattle on a regular basis. There is a practical reason for this in the fact that they cannot store the meat of a slaughtered animal, though this is changing rapidly with the general spread of household freezers.

⁶² In England, this practice recently led to tough polemics between animal welfare militants and dairy farmers (Turner 1996). In Uruguay, so far as I know, the animal rights movement has never publicly accused cattle herders of bad practices against animals.

⁶³ Many farmers have commented to me that the average price they are receiving for their milk is so low (in the region of US\$ 0.16/litre in February 1998), that they found it better to use part of it to grow calves and then sell them. Extensionists make their own mathematical calculations, of course. But it seems that the conflict between final 'numbers' is more related to non-quantifiable variables like the imagination of the future from the perspective of the present economic instability.

Nevertheless, it is still more convenient for a small family to buy meat from local butchers or to consume it during community festivals⁶⁴.

Sheep herding is more common on larger farms due to the greater availability of pastures. On large *estancias*, the combined herding of sheep and cattle has traditionally been a way to cope with strong climate variation, since sheep are more resistant to droughts while cattle are not so affected by rain and cold weather (Wettstein 1980: 54). Moreover, both kinds of livestock can graze alternately on the same pastures, though nowadays 'inter-livestocking' on artificial pastures might jeopardise its regeneration.

The raising of pigs is an important activity on half of the dairy farms I studied. It occurs exclusively on family farms. As I mentioned earlier, pigs traditionally represented a 'savings box' among *Canarios* farmers. Furthermore, it is still common practice to perform a *faena* in the autumn, in order to have sausages and other salted by-products to consume over winter. For one or two days, all the family and other relatives gather to work. They share costs and distribute by-products equally⁶⁵. On the other hand, market

⁶⁴ It is always a good advertisement to attract visitors to charity festivals in rural areas to offer the traditional *asado con cuero* [roast beef with hide]. Locals not only eat it during the festival, but buy several portions and keep them refrigerated to be consumed in the following days. Indeed, they state that it tastes nicer a day or two after being roasted.

⁶⁵ Again, the introduction of freezers has changed some of the technical features of the *faena*. Nowadays it can be performed in any season and the quality of food will be conserved. Moreover, supposing that the sharing and distribution of food between relatives and neighbours were reinforced by the fact that it will be rotten if not consumed in a certain period, the option of frozen storage might allow these social pressures to be circumvented. Nevertheless, I would suggest that the social meaning of the *faena* became stronger than its dietary function. It seems to be a less 'utilitarian' feast, though money-saving reasons are still present. For instance, I participated in one *faena* organised by the family-in-law of a farmer I was visiting at that time. Her son-in-law, a livestock producer himself, phoned and asked if she wanted to share the costs of the *faena* that would take place next Saturday. Otherwise, he added, he would call other interested people. My hostess agreed, and on Saturday her two sons and I spent the entire afternoon and evening helping in various tasks and had a barbecue in the evening. The head of the dairy farm did not go because somebody had to stay for milking. The eldest son was not very keen on going to the *faena*, but an adult had to represent the family and co-operate, and I was only a guest. A week later, the food was distributed in similar fractions between the four participating nuclear families.

oriented pig raising has been enhanced in recent years in Villa del Rosario through the co-operation between farmers and University extensionists. The latter are promoting a more scientifically informed practice in the context of farmers' collective action. Pigs ceased to be merely scavenging animals. Indeed, crops and meadows have been grown exclusively to feed them, and some improvements in pigpen building and animal breeding have been made, due to the new value of hogs in the household economy.

Fowls are raised mainly for domestic consumption, both on small and large dairy farms. Nevertheless, the occasional selling of eggs can be another source of irregular cash on many small farms. Moreover, eggs are sometimes bartered for other consumer goods. Hens and chickens wander about freely or are kept in relatively large poultry yards. They are fed mainly with 'home-made' grain.

Horticulture is generally practised in a small fenced plot (never bigger than half a hectare) near the residential houses. Vegetables and roots are grown for household consumption, though sometimes they are processed and sold in the market (e.g. tomato sauce). The main things grown are tomatoes, sweet potatoes [*boñatos*], white potatoes, beans and squash. On some farms, there are fruit trees which provide seasonal fruits to the household and might be used as well to prepare fruit jam for sale⁶⁶.

Finally, under the category of 'others' I have included some market-oriented activities like raising rabbits, growing selected seeds, producing fodder, and forestry. These are performed on just a few farms.

⁶⁶ A couple of years before I conducted fieldwork in Villa del Rosario, a group of women received official training to start an artisan manufacture co-operative. The collective enterprise failed, but some women have continued to make jam which is sold in towns, local shops or directly in their farms.

Part 2. The social domain in dairy farming

In the previous sections, I described the multiple productive activities conducted on family dairy farms. Now, I shall turn my focus on the way people organise themselves to carry on these activities. As I explained in the introductory section of this chapter, my analysis will be guided by a distinction between non-commodified and commodified labour relations. In this part of the chapter, I include household chores, which were not previously identified as productive activity in the strict sense. However, as can be seen below, it is not possible to understand the organisation of labour in family household estates without incorporating activities like house cleaning, care for the elderly, and so forth, as relevant variables to highlight the patterns of labour organisation on and off the farm.

Non-commodified labour relations

The intra-household domain: inter-generational relations of labour

I start this section with an analysis of the current land tenure system, which is intimately related to household estate inheritance and household reproduction strategies. It will allow us to better understand the current interrelations between activities and who might perform them according to age, and thus the kind of inter-generational co-operation and conflicts that emerge among farmers.

I have demonstrated in chapter 2 that changes in the predominant land tenure system have been a significant element in the way people have gained access to natural assets.

Over the second half of the 20th century, most farmers in the country became private owners of their lands. The last agricultural census shows that almost 60% of farmers in the province of Lavalleja are private owners of their land. Moreover, if we also consider those who appeared in the statistics as not only owning a plot but also leasing another plot, the percentage of landowners in the province rises to 74%, a similar pattern to that for the whole country (Dirección de Censos y Encuestas 1994). My own observations in Villa del Rosario coincide with this general trend towards private ownership of land. Indeed, my survey shows that 18 out of 24 dairy farmers own their land, though 6 of them also rent land (Table 5)⁶⁷.

Land tenancy			
Proprietor	Tenant	Proprietor+tenant	Total
50	25	25	100

Table 5. Land tenancy among Villa del Rosario's dairy farms (in percentage)
Source: Fieldwork.

Those dairy farmers who rent land do so either from a relative or the State and rarely from private landowners (see table 6). I believe this fact provides farmers with a sense of security for long-term farming on rented plots. Nevertheless, as my informants always stressed, neither relatives nor the State are regarded as 'for-ever loyal partners'. For instance, a landowner may be more inclined to renew the tenancy agreement of a relative, or even to sell the plot to him/her at a price below market values, although, as many cases demonstrate, there is no warranty that such a kinship affiliation could lead the landowner to reject a better offer from elsewhere. Although the experience with state-owned land has been quite positive, people feel that the State and its representative organisations are not politically neutral. Thus, its policies might change

⁶⁷ A survey carried out by the Faculty of Veterinary Medicine among Villa del Rosario's pig producers in 1997 shows that 18 out of a total of 20 farmers own their land (personal communication).

according to the 'colour' of the party in power, or even be driven by the personal or corporate claims of someone taking a superior position in office. Consequently dairy farmers in general, though not exclusively, are very cautious in their investments in rented land. Nonetheless, artificial meadows, which are considered to be a medium-term investment indicator, are being established on rented lands, showing that farmers have confidence in their access to the results of their work. This finding to some degree contradicts historical interpretations of the limits imposed by the dominant leasing system on the intensification of agriculture (e.g. Kirby 1975)⁶⁸.

Origin of rented land	Number of cases ^a
Official land (INC)	4
Relatives	5
Private agent	5

Table 6. Social origins of rented land among dairy farmers in Villa del Rosario.

Note: ^a Where a farmer rents land of different social origins, it appears under more than one category.

Source: Fieldwork.

To sum up, land tenure shows a trend towards private ownership that affords, in principle, the necessary confidence for farmers to work their farms (cf. Netting 1993, for a similar conclusion in a worldwide comparative study of smallholders). Nevertheless, from the point of view of farmers, the ideal situation would be to own the totality of their land. This might give them, among other things, the chance to access better rural credits by using the land as collateral. However, this utilitarian reason seems to me not enough to explain farmers' eagerness to secure private ownership of land. I would suggest that among farmers, to work the land and/or make improvements to the farm is seen as present action with future results. Yet, this kind of future cannot be

⁶⁸ Kirby wrote: 'Uruguayan lease holders suffer from instability of tenure—hence, their inability to invest in fixed improvements. [...] [T]he basic security of tenure is five years, [...] such a short term is not sufficient for an intensification of farming systems, which would require the establishment of artificial pastures, subdivision of fields, and so on' (1975: 270). (See Plottier and Notaro 1966 for a different interpretation.)

abstractly measured in years or decades. Indeed, farmers seem to have a sense of environmental transformation that transcends the short-term scale, that is usually associated with leasing land. Farming is not only the growth of particular crops, animals and so forth in the present. Human labour is also incorporated in the land and nobody is willing to lose its fruits. Moreover, I would contend that land is not external to the domain of social relations. Indeed, land mediates interpersonal arrangements, as was discussed in the case of leased land. The working of the land is not only a technical relation but also expresses social relations. Long-term relations between persons, centred on working a particular piece of land, will afford a longer-term subjective attachment to it. Consequently there exists a basis for regarding land (which encompasses a series of different environmental components like trees, ravines, hills, and so forth) as, paraphrasing Marx, the 'inorganic extension of human bodies'. On the other hand, the mediating character of the land lies not only in the temporal dimension but also in the possibility of making a living with it. In this regard, I would not say that in the current situation of economic crisis the sense of future extends further than the imagined lifetime of an adult farmer and his children. The concept of 'future generations', so commonly used in the discourse of promoters of 'sustainable development', seems to me alien to family farmers' own concepts, if we assume that the timescale of the notion of sustainability involves an indefinite number of still unborn generations. Thus the attachment to the land weakens when land as an object and means of labour cannot provide the livelihood for the family as a whole or, at least, most of its members. (I return to this in chapter 4.)

Having presented a brief analysis of the land tenure system in Villa del Rosario, I shall turn to an exploration of the organisation of labour in the temporal dimension of

households' reproduction cycles. Every household estate has its own particular features but we can still draw out some common features of the organisation of farms according to inter-generational relations. It was concluded in the previous chapter that most of the current household estates in the area under study are mainly the result of past production cycles carried out by four generations of farmers since they settled at the turn of the last century. Throughout this period, children have normally provided labour to the parental estate from a very early age, until they get married and build their own estate with their partners or move to town. However, one of the children, generally a boy⁶⁹, becomes the successor to the parental estate. Among other responsibilities, he will look after his parents once they retire from work⁷⁰. Through various informal and formal procedures, parents normally transfer control over their assets long before they retire. However, land might not be completely inherited until both parents die. Some authors understand this mechanism as the only way parents have to secure part of their successor's labour for themselves in their old age. Furthermore, if the proposed successor were to abandon the estate, parents who still own the land would be able to secure a source of income by leasing it, or selling part or the whole of the plot (Papma 1992: 36).

Generally, the successor gets married and continues to live in the parental household with his spouse and children, conforming to the pattern of the 'stem' or 'lineal'

⁶⁹ Graña (1996) has recently pointed out that among dairy farmers in southern Uruguay parents develop various ways to avoid the transfer of the rural enterprise to female offspring.

⁷⁰ The institution of *minoret* has been described in many agricultural or peasant societies (Papma 1992: 27; Stanek 1993: 59). *Minoret* is the inheritance of the parental household by the youngest son. In this way, parents ensure that when they would become too old to work the land and produce food and/or income, the youngest son will be in the prime of life to work and give his parents material support. I cannot confirm if *minoret* was the common pattern of inheritance among crop-farmers in the past, but it is not the general rule nowadays. Indeed, it seems that parents co-opt as their successor that boy who shows more inclination, motivation and skills for agriculture work, despite his age.

household (Blanton 1994: 5) (Plate 8). The new nuclear family usually dwells on the parental plot, but in a separate house consisting a residential compound or household cluster (ibid.: 6). The successor's family would become an independent unit of consumption, but the farm, as a productive entity, would remain united (see chapter 4). Parents would keep control over their retirement pension and their part of the income from productive activities, while the successor would become responsible for paying the farm's debts and bills (e.g., council tax). The main workload is carried by the successor and his family, though elders continue to provide a significant part of the labour in the production process, as well as giving advice on pending decisions based on their experience. This is reflected in table 7 below, where it is shown that both older men and women will continue working at their traditional tasks even after the legal age of retirement. Indeed, they might fill labour gaps in the different productive processes, depending on their current physical and intellectual capacities.

ACTIVITY	Sex		Age ^a		
	Men	Women	Children	Adults	Elderly
Agriculture					
Tilling the soil (ploughing, fertilising, etc.)	✓✓	×	×	✓✓	✓
Maintenance (weeding, re-fertilising, fencing, etc.)	✓✓	×	×	✓✓	✓
Crops and hay harvest	✓✓	×	×	✓✓	✓
Storage of fodder	✓✓	⊗	✓	✓✓	✓
Cattle management					
Cattle driven to pastures and water	✓✓	✓	✓	✓✓	✓
Sanitary treatments	✓✓	✓✓	✓	✓✓	✓
Insemination	✓✓	×	×	✓✓	×
Feeding calves	✓	✓✓	✓	✓✓	✓
Keeping records	✓	✓✓	✓	✓✓	×
Milking					
Milking	✓✓	✓✓	⊗	✓✓	✓
Cleaning parlour	✓	✓✓	⊗	✓✓	✓
Machine washing	✓	✓✓	×	✓✓	✓
Bulk tank washing	⊗	✓✓	×	✓✓	×
Bureaucratic work					
	✓✓	✓	×	✓✓	✓
Non-dairy farming production					
Pig raising	✓✓	✓	✓	✓✓	✓
Poultry	⊗	✓✓	✓	✓✓	✓
Horticulture	⊗	✓✓	✓	✓✓	✓
Household manufacture (cheese, jams, etc.)	×	✓✓	✓	✓✓	✓✓
Household chores					
Meal preparation, dishwashing, house cleaning, caring for children	⊗	✓✓	✓	✓✓	✓✓

Table 7. Gender and age division of labour in family dairy farms.

Key: ✓✓ Almost always performed; ✓ Occasionally performed; ⊗ Only if nobody else might do it; × Never performed.

Note: ^a Age categories are defined as follows: 'children' from five years old until they finish primary school (around 13 years old); 'adults' after finishing school until legally retired from work activities around 60 years old; and elderly, after official retirement.

Source: fieldwork

The decision making process and inter-generational relations involved in the case of lineal households, have been affected by changes in technology and managerial practices. It seems that in the past the head of the household kept the decision-making

process under his almost uncontested control⁷¹. Once a prosperous livestock farmer told me how difficult it was for him to convince his father to establish artificial meadows and replace oxen with a tractor in the late 1960s. His experience resonates with other peoples' accounts. For instance, an informant in his sixties said:

My father rejected my idea to buy a tractor. Maybe because he was afraid of applying for credit to do so. I was 18 years old, the age you have to go and do things. I went to see my schoolteacher, a very clever man. He told me: 'Leave him alone; go step by step'. He talked to my father and finally convinced him. This was in 1952. We were finally able to cut the traditional cycle of maize, wheat, and tomatoes.

It seems that as soon as the prevalent practical knowledge became insufficient to reproduce the household estate's economy, the option was to allow a more democratic inter-generational decision-making process. Younger generations were more open to external advice and, probably, more enthusiastic to take the risk of new investments in a context of the expansion of rural credits. The positive results in agricultural yields and economic benefits were the tangible proof that new knowledge and practices were required, and they were embodied in youngsters. In other words, youngsters were able to change their parents' *habitus* (Bourdieu 1998; Bourdieu and Wacquant 1992)⁷². These kinds of conflict are not absent among current family dairy farmers (see text box 5), though there seems to be more openness between adults and the younger generation. To be sure, non-commodified labour relations in the farm do not exclude asymmetrical

⁷¹ An elder man in his 90s pointed out: 'In the past we grew tight to the house [acasados], as if we were younger than we really were. Moreover, the family was always raised very close to the father'. In 1937, an anonymous author wrote in a rural-oriented magazine, an article entitled 'Filial obedience' where it was pointed out: 'The obedience of children towards their parents is the basis of education, and the securest pledge for domestic peace. On the other hand, to disobey will lead in the future to strife, ingratitude, and lack of harmony at home. Needless to say that an undisciplined child is the cause of his parents' grief and sorrow' (Anon. 1937a).

⁷² Pierre Bourdieu wrote: '[...]generation conflicts oppose not age-classes separated by natural properties, but habitus which have been produced by different "modes of generation", that is, by conditions of existence which, in imposing different definitions of the impossible, the possible, and the probable, cause one group to experience as natural or reasonable practices or aspirations which another group finds unthinkable or scandalous, and vice versa' (Bourdieu 1998: 78).

power relations between generations. There is an informal rule that gives parents the right to ask children or youngsters to do particular tasks, though physical violence seems to be rare. Parents have the moral authority to do so. Historically the State has played a significant role in weakening such parental authority by enforcing, for instance, the attendance of children at primary school. Moreover, the easier access to public secondary school and further studies in rural areas has even enhanced the autonomy of the younger generation⁷³. This change in practices and values is reflected in the increasing rate of formal education among rural people (INE 1997b: 14). Indeed, as I was told by a social psychologist, *'In rural Uruguay the youth is every day more youthful'*, attesting the increasing independence of the younger generation from their parents' moral authority.

On the other hand, a common strategy to avoid inter-generational conflicts has been for parents to move permanently to town when retired, thus leaving the successor with partial control over land-use and the freedom to manage the farm. In exchange, parents would ask for a payment for the land rent and available tools, which together with their retirement pension would be the source of income until they both die.

⁷³ A head of a household told me: *'Can you believe that I had to contract a milker when my wife was pregnant, whilst having two adult daughters who are doing nothing at the moment?'* Yet, the girls were part-time students, looking forward to improve their educational profile and find a job in town.

Javier is a young man in his 30s, with a minor handicap in one of his hands. He lives with his parents on a very small dairy farm. The milk produced is sent to the local cheese dairy. Probably, he will be the successor to the household estate, because his sister has definitely left it. In the course of a collective interview at the house, he complained, in the presence of his father, that the latter was too stubborn to allow him to draw money from the estate to buy a milking machine. According to Javier, mechanical milking would give him the chance to conduct the milking routine and thus, to increase the dairy herd. This, in turn—he continued—could be a first step towards the association of the household to *Conaprole* which might represent an improvement in their livelihood. Then his father, after accepting that the current condition of the farm is precarious, replied by saying that the economic situation of Co-op dairy farmers is not brilliant at all. Hence, he added, to imitate them is not a guarantee of success. Javier put an end to the discussion with apparent resignation. Later on, when alone, he told me that he believes the real matter is that his father wants to keep control over the production process and its results. This control might be threatened by Javier's greater involvement in practical tasks, which is the basis for gaining the moral status to claim changes in the way the farm is run.

Text box 5. Inter-generational strive.

To complete our account of inter-generational relations, some remarks are needed regarding the position of non-succeeding heirs. The latter have sometimes received part of their inheritance as wedding gifts. In the case of young men, it seems that in the past, parents used to buy a plot in the area, drawing wealth from their original estate to help the new couple to start their own household. According to some elders' testimonies, parents preferred to settle their sons not far from them so as to be able to collaborate in agricultural work. Daughters, on the other hand, used to receive small farm animals as a dowry. Nowadays, it seems more common for non-succeeding heirs to leave the farm even before marriage, to find a job on another farm or in town. In this case, probably, they would not receive any part of the inheritance until the parents die, which might create strife between those who continue to increase the estate's wealth and those who have made their livelihoods without adding anything to the parental estate. According to my observations, daughters commonly (though not exclusively) receive their part of the inheritance as financial support for their further education, after finishing primary

school. It is believed that having a post-primary school education would help them find employment away from the farm⁷⁴. I agree with Papma (1992: 33) that these kinds of household strategies aim to maintain the unity of the estate in contexts of land scarcity, by excluding heirs other than the successor from its inheritance.

Finally when parents die, according to the civil law, heirs of both sexes have equal property rights over land and capital, unless otherwise stated in a will. Despite efforts on the part of parents to resolve the problem of inheritance while they are still alive, heirs have generally to make new agreements. I did not come across in my study any case of strong disagreement between heirs. In general, the agreements between them are based on economic transactions. The successor might buy other heirs' shares or pay a rent in cash. In the latter case, the decisions regarding production are taken independently by the successor. A number of factors are at work, underlying and facilitating the process of succession, including the commodification of land, the reduction in the number of children and the relatively early detachment of family members from agricultural activities.

Labour co-operation among household members is characterised by a generalised pooling of effort, such that people are expected to perform activities which yield results

⁷⁴ A degree in primary school teaching [*magisterio*] continues to be a desired goal among young daughters aiming to reside in the countryside. However, in the last decades, daughters oriented their further studies to university degrees or professional training as secretaries, baby-sitters, cooks, and so on. They generally have to move temporarily to town or commute, and in most cases, they will end up living in towns. Notwithstanding, there are a few cases of girls who came back to Villa del Rosario after finishing their degrees or training courses. Regarding a similar case in southern Brazil Papma wrote: 'As land becomes scarce, school education is regarded as a legitimate alternative to land. Schooling up to high school level is thought to provide children with the opportunity to find employment, and is regarded as an alternative way of helping a young couple to "get going"' (1992: 33). The similarities in this relation between girls, education and detachment from agriculture, not only in such neighbouring regions as Brazil, but also as far afield as eastern Canada (Stanek 1993: 68), are remarkable.

for the whole household estate. A particular worker assumes that his effort is part of the collective building up of the household estate. Each person will add to the common wealth according to his/her skills, without any kind of objective measure.

During my fieldwork there was an exceptional case that highlights the generally non-commodified character of intra-household labour relations. I asked the head of a household whether he had contracted any worker over the last year. He answered positively and mentioned that a man was paid to do some logging [*monteada*] in order to obtain wood for fencing. Surprisingly, he added that he had also paid his two sons to harvest maize. Later on, I asked some other farmers about this particular case, just to know if I had missed similar examples in my previous conversations. They commented that such an event is uncommon. Furthermore, they stated that this was a troublesome situation. They saw it as an '*exploitative relation*' between father and sons, even though the amount of money was, as they said, '*the normal payment for that job*'. I was told that old and young people should help each other on the farm. Furthermore, this moral judgement was the basis for people's explanation and justification for these youngsters' abiding concern to engage in any off-farm temporary job they could find. Probably, the ambiguous social reputation of the father, as a very hard worker but extremely stingy, is reinforced by this kind of relation with close relatives.

The intra-household domain: the gender division of labour⁷⁵

⁷⁵ I use interchangeably the words gender and sex to mean the socially recognised differences between male and female among human beings. Both, gender and sex, are academic notions that have evolved historically, and cannot be attributed solely either to biological or to cultural characteristics (Hobsbawm 1994: 554).

Table 7 above shows the relationship between gender and practical activities conducted on a typical dairy farm. I wish to draw attention to the fact that there is a clear gender division of labour between field work and household chores, but this neat distinction cannot be applied to other activities on the farm.

Men do carry on with those activities directly related to the growth of plants for forage and livestock herding. It is common to hear among locals of both sexes that men's greater 'innate' physical strength makes them more fitted to perform a variety of tasks in the fields⁷⁶. Although this 'objective' advantage seems to decline with the use of modern agricultural machinery, the ideological assumption that male skills are prerequisite for practical agriculture in the fields is reproduced in new forms. The relationship between gender and tool-using seems to me a stronger ideological basis for this practical distinction, which inevitably hinges on the use and control of tools and machines. Men's affinity with engines and machines appears to be taken for granted, and is expressed without qualification in the commonly heard utterance '*Men love machinery*' [*A los hombres les gustan los fierros*']. Undoubtedly, it helps men to keep control, though not necessarily ownership, of a significant part of a farm's means of production. Moreover, this technical competence is part of the 'form of masculinity' (Kline and Pinch 1996: 778) and reinforces the rural gender system.

⁷⁶ This naturalisation of males' capabilities for fieldwork seems to be common to many agricultural communities. In his comments on Guyer's (1988) 'culturalist' approach to patterns of gender division of labour in agriculture Robert Hunt points out that according to a study in an Indian village conducted by anthropologist Maclachlan in the early 1980s '...cropping success is a function of the thoroughness of plowing and [...] the thoroughness is positively related to upper-body strength, commonly greatest among young males; therefore it makes a good deal of "naturalist" sense for the young men to do most of the plowing. This does not mean that nobody else can plow, only that the most effective plowpersons are young men' (Hunt 1988: 264)

Having said that, I would like to qualify my own argument by suggesting that the gender division of labour between fieldwork and household chores depends more on the ascription of the latter to women than on the emphasis on men's capabilities to work in the fields with sophisticated agricultural machinery. Firstly, household chores also involve the use of new tools and machines. Washing machines, liquifiers, electric cookers and ovens, sewing machines and many other modern artefacts are components of the daily environment of women in the farmstead. Therefore, modern tool-using is not taken to represent a cognitive obstacle for women. Moreover, I was told that in a few cases women might drive the tractor to till the soil, which seems to confirm that nothing is held to lie in the 'genes' or in the 'body structure' that might decrease female 'efficiency' in tool and machine use. Indeed, women increasingly drive motorcycles and cars to travel in and out of the local area. Secondly, child-rearing, feeding the family and health care are almost exclusively women's responsibilities. I did not explore in detail the discursive aspect of this social mandate, but persons of both sexes might say, again, that there is a 'natural instinct' among women to care for their children, their husband and the elderly. In more concrete terms, men and women will argue that 'women do it better' and this is sufficient reason to maintain the traditional denomination of the senior woman as the head of the house [*la patrona*], while the man is the head of the farm [*el productor*]. Thus, women *have to* stay near the houses to fulfil social expectations. Consequently a housewife will be in charge of household chores and other productive activities that can be carried out while allowing regular return to the house to look after meals, children, handicapped elderly people and so on. Fieldwork, even on smallholdings where physical distances are not great, limits one's ability to meet these 'obligations'. Having said that, why did I not find many single and younger women working in the fields? I believe that firstly, there is no need for more

labour in the fields than that provided by a man, or a man and a son if there is one. Secondly, a young girl will be co-opted by the housewife to help with the never-ending tasks involved in the house and nearby areas.

To be fair, things are changing in the realm of the farmstead as they did previously in the fields⁷⁷. Adult young men, according to women's own accounts, differ from the previous generation in that they are more concerned with and do participate in child nurturing. However, this is not a unilateral change. On the contrary, women themselves have demanded their husbands' greater involvement. In addition to new ideological constructs, which might be the consequence of new gender images transmitted in educational institutions and through the mass media, I want to draw attention to two new practical matters among dairy farmers that should be taken into account in explaining some recent changes in the gender division of labour.

Firstly, since the 1980s many women have been employed temporarily as domestic servants in tourist resorts along the southern coast. For a period that might last between a fortnight and a couple of months over the summer, these women leave their farms to be engaged in waged-work. This is called '*hacer la temporada*'. Though not always a regular activity, it has become a permanent source of income in many households. Sometimes, it started as a means to buy a particular good or to pay a debt, but it

⁷⁷ When agriculture work was less mechanised, female labour was needed for many labour-intensive tasks like weeding or sugar-beet harvest.

continued because every year there were 'new' needs and, consequently, 'new' debts⁷⁸.

My point is that, in many cases, men have to look after the house and the family, in the way that, traditionally, women did (see text boxes 6 and 7). Therefore, the engagement of women in off-farm temporary waged work has been a major reason to change daily gendered habits. Nevertheless, as soon as women are back at the farmstead, the gender division of labour seems to return to the traditional pattern.

⁷⁸ Although in the early 1980s both women and men used to find temporary jobs in the southern coast, women are nowadays in a better position to find one, because domestic services are always in demand. Moreover, if a woman develops a good relation with her employer based on trust and efficiency, the latter tends to re-employ her or, at least, to recommend her to other friends. On the other hand, a similar network of contacts has developed in the rural locality. For instance, a 17 year-old girl was encouraged by the local schoolteacher to go for a temporary job as a domestic servant. The teacher found a 'family' for her, through her own employer. The girl told me the experience was ambiguous. On the one hand, the family and job were not bad, but she missed home a lot and got depressed. Anyway, she earned the money to buy a motorcycle, which will be shared with the rest of the family.

When visiting a dairy farm in the evening I was invited to have dinner with the head of the household and his son. I remember how embarrassing it was for them to prepare a Spanish omelette for the three of us. Needless to say, they apologised for the dish and the 'mess' in the house, and explained that the housewife was in the main tourist resort of *Punta del Este*, where she has been employed every summer for the last four years. They agreed that men in the countryside are good at looking after themselves, but the problem arises when they have to look after other people, like guests, children or elders.

Text box 6. New gender roles (I).

Carolina has been employed in a seaside resort as a domestic servant for the last eight years. Whilst she is on the coast, her husband is in charge of the household chores, together with their two children (11 and 7 years old). He does not engage in temporary off-farm waged work until his wife is back. Last year, they bought a freezer with part of her earnings. This summer it was filled up with ready-made food for two months, the time Carolina expected to be away from home. Moreover, the recent installation of a telephone in the house was intended, mainly for them to be in touch in summer for 'any problem that might arise at home', even though the installation and further costs were considered to be a 'luxury' in their current financial situation.

Text box 7. New gender roles (II)

The second practical consideration bearing on recent changes in the gender division of labour concerns mechanical milking. According to table 7, both men and women engage in milking operations. Every normal operation is interchangeable between the sexes. Men might even clean up the bulk tank, even though this is considered an almost exclusively female task. Individual schedules, a journey away from the farm and other factors might have an effect on who would milk on a particular day or during a particular milking shift.

This has two significant consequences. Firstly, men became involved in a working practice that was traditionally conducted among *Canarios* farmers by women and children. This change in practice would lead to a new relationship with animals and the experience of hygiene among men (see chapter 6, part 1). Secondly, women have become fundamental agents in the reproduction of the basic source of income of the farm. Therefore, they have gained a more prominent position in decision-making and

managerial aspects of the farm as a whole. This new position is only partially recognised by men and rural extensionists, though there is increasing concern among the latter to identify women as the target group for training and technical advice⁷⁹. I would suggest that the mechanisation of milking practices led to the merging of two formerly differentiated habitus. It attracted men to milking—a task characterised by its high frequency, an element associated with female jobs in cross-cultural studies (Guyer 1988: 254; see also Mumford 1967: 140). At the same time, it afforded women the opportunity to leave the farmstead to be engaged in socially recognised ‘productive’ activities which might legitimise their status as rural producers.

The above analysis is intended to show a social and cultural trend. I am aware that in many cases a more radical gender division of labour persists, in general keeping women in a disadvantaged position in relation to the use and control of the means of production (see Kline and Pinch 1996: 783). On the other hand, changes among family dairy farmers cannot be generalised to other experiences in the countryside. For instance, in non-family dairy farms, women are less often engaged in milking. According to my knowledge, contracted workers are mainly men, though sometimes their wives or daughters do perform some operations informally (e.g., cleaning the bulk tank). The employment of men for milking in non-family farms reinforces my idea that there are no ‘naturally’ engendered operations, and that men can hold similar values of the working environment as women are supposed to do such as the stress on cleanliness and patience with animals.

⁷⁹ In 1998, a group of former *Conaprole* extensionists organised a training course tailored for women dairy farmers in the nearby Province of Florida, because—they stated in a radio programme—‘women are demanding specialised training as long as they increase their participation in production’. The main themes of the training course were selected by the

Let me make a final comment at this stage of my analysis regarding mechanical milking and gender. Though I mentioned the exchangeability of milking operations, which leads to a sharing of practical control and the acquisition of skills in tool-using, I have to stress the fact that the maintenance and replacement of mechanical parts of the milking machinery is almost exclusively men's work. In this way, the ideological construct of men being better able to cope with machinery is reproduced in practice. Thus, I would suggest, women's control over this particular machine-tool is limited to its use, while the image of men, as indispensable to the material reproduction of the principal means of production in relation not only to milking machines but also to land, tractors, agricultural tools and cattle, is perpetuated⁸⁰.

We may conclude that, in principle, the reproduction of plant and animal life is men's work, while the reproduction of human life is the task of women.

The inter-household domain: reciprocal aid

Non-commodified labour relations were also observed in inter-household work. Whereas in the past, both men and women were involved in inter-household relations of production, nowadays men are the ones who primarily contribute to their development. Several Uruguayan authors have stressed the presence of mutual aid arrangements

participants themselves and included the nutrition of lactating cows and the use of milking machinery with emphasis on bulk tank cleaning (Dinámica Rural 13/7/98).

⁸⁰ I only found men conducting artificial insemination, hence the 'reproduction' of cows and the continuation of the milk herd might be seen, in principle, as men's responsibility, too. As male veterinarians and farmers often say, '*I made this cow*', while referring to an animal that resulted from their artificial insemination operation. I do not know what linguistic expressions are used by women veterinarians. Probably, they might speak in similar ways, which does not necessarily conflict with my interpretation, but might add other gender issues in the formation of professionals.

between *Canarios* crop-farmers since they arrived in the country (Berro 1975: 83; Solari 1958: 317). The main reason found for such mechanisms of co-operation was the shortage of human labour and tools for agricultural activities on individual farms, especially during the wheat harvest before the introduction of self-propelled harvesters. Also, over the sugar-beet period in the 1950s, neighbours and relatives used to reap at the time of the harvest, until this activity was externalised and performed by contracted crews.

Nowadays, mutual aid is still important among dairy farmers, though the number of persons involved on each occasion is much lower than in the past. Local people state that, thanks to this kind of reciprocal agreement, some agricultural work can be finished on time, consequently reducing the risks due to unpredictable weather. Moreover, people see in mutual aid a way to reduce labour costs in peak periods. Also, work is experienced as less boring when shared with other persons. Finally, the exchange of labour may be accompanied by the exchange of machinery and other means of production, thus giving farmers access to agricultural tools they do not own (e.g., a tractor driven disc plough).

The most important co-operative agricultural activity among dairy farmers in Villa del Rosario is the production of individually managed trench maize silage. Maize silage is prepared in the autumn (March-June) to be ready as a winter reserve. Labour might be organised between farmers who are members of the same dairy working team, though not necessarily. Indeed, mutual aid seems to rest more on good neighbourhood and

strategic compromise, than on more formal agreements⁸¹. Between five and eight people will gather for the occasion, including the owner of the farm and his son(s). Probably, not all neighbours will stay all day long. The farmer who builds the silage from his maize plantation pays for the hiring of the chopping machine, the tractor driver and the petrol, and provides a meal and drinks (cooked and served by his wife) to anyone who comes to help him. If a farmer, who has already received others' help, is unable to participate personally in his neighbour's silage preparation, he should send a representative. The same principle is involved if somebody wants to receive aid in preparing his/her own future silage.

The smooth introduction of storage techniques for other crops, i.e. sorghum silage, in the area might affect this co-operative practice. Wet grain silage requires more sophisticated machinery and different skills and has been offered as an agricultural service by wealthier dairy farmers from adjacent areas. Maize silage, a relatively recent way of processing crops, is now called 'traditional silage' in contrast to 'modern wet silage', demonstrating the fast pace of technical change in modern agriculture. Should this new technique be generalised, mutual aid would not be necessary from a pragmatic perspective. The externalisation of agricultural activities could affect the character of inter-household labour relations.

⁸¹ I believe one of the difficulties experienced by dairy working teams is that after a period of openness, they limited the incorporation of new members to keep control of common machinery and debts. Moreover, team members continued their mutual reciprocal exchange with other neighbours in a more informal, and traditional, way. Therefore the working team was only one of the centres of collective action. This kind of diversification of working sociality seems to be guided by the more general principle of having always an alternative 'escape' in case of failure. Such a strategy might reinforce individual farm development and identity, against a more collective project.

Undoubtedly, the way practical agriculture has evolved requires the increasing use of mechanical tools and machines among dairy farmers, though several activities are still carried on manually and/or using animal power. In addition to the private or collective ownership of certain means of production, it is common to borrow agricultural tools from neighbours. Reciprocal tool exchange is a respected social principle, especially among poorer farmers. Yet the current engagement in reciprocal relations does not mean that people are always happy to be bound by this relation. As a young farmer pointed out,

If somebody comes to ask you for a tool, you won't refuse him. However, it often happens that they don't take care of it, and at the end of the day, the tools are not ready for use when you need them. Some folks don't lend their tools. Generally, they are those who have got them all. Hence, they won't need to borrow from anybody. This is why.

Indeed, some tools do not become part of this exchange network, for instance, tractors, baling machines, harvesters, and, sometimes, large disk ploughs. The individual or collective owners of these tools might offer them to let. Therefore, if not owned, access to these machines and tools is generally through a commodified social relationship (see below for further explanation). Although every farmer would agree that private individual ownership of the means of production is the best option, in recent years both reciprocity and the contracting of agricultural services have become more general.

Inter-household aid is organised most of all between pairs of households rather than multiple families. Farmers usually have a favourite 'partner' [*socio*] who might be a neighbour or a relative, often from the same generation, who would have been a school companion, and who is, in general, from the same social class. An informant put it this way,

We, small producers, do help each other. We have no alternative. The big ones also help one another, but they do not require too much help because they have enough machinery.

Commodified labour relations

Commodified labour relations can be seen from two different sides. On the one hand, the dairy farmer might buy human labour to do some job on his/her farm. On the other hand, he/she might become engaged as a permanent or temporary waged-worker⁸².

Contracted labour

According to my survey, only 3 out of 19 family farms had not contracted external labour over the year before my interview. These 16 farms had paid for short-term agricultural and in-farm maintenance work (e.g., fencing). The most generalised form of contract is to pay the owner of a tractor and/or specialised machine (e.g. threshing machine) to do one of the following activities: tilling the soil, sowing, maize threshing, hay cutting and baling, fumigation of crops and logging. Most of these activities are subsumed under the notion of 'work with tractor' [*trabajo con tractor*]. The need to contract a tractor driver and his means of production is generally the consequence of the lack of a powerful tractor or of tractor-driven tools in the household. Furthermore, it is not uncommon to find that the farm's tractor is seriously damaged and it is difficult for

⁸² I consider permanent waged-work as that which is carried out throughout the year and which demands a relatively fixed amount of hours away from the farm. On the other hand, temporary waged-work is understood as (i) jobs concentrated in particular periods of the year according to season and/or (ii) more contingent jobs (e.g. artificial insemination). Temporary jobs are commonly called *changas*, a word derived from the term *changadores*, rural dwellers who used to be contracted by rich entrepreneurs to conduct cattle hunting and hide extraction during the 18th century. Several towns' and rivers' names in the south of the country evoke the most famous *changadores* (e.g. Pando, Solís, Maldonado).

the farmer to save money to repair it⁸³. In contracting independent agricultural services, the control of dairy farmers over 'bought' human labour is only partial due to the provider's ownership and control of his means of production. Moreover, although money is used as the general measure of value for the received service, the renewal of friendship, or at least good neighbourliness, also plays an important part in the contract. Thus money does not, in itself, lead to impersonal, commodified relations.

Contracting permanent waged-workers is rare among family dairy farmers. However, I did observe a couple of cases where waged milkers were contracted. In two cases, this was because a woman was pregnant. Whereas in one of the cases the farmer was sure of the short-term nature of the working agreement, the other couple were thinking of keeping the waged milker after the delivery, to allow the head of the household to devote more time to activities other than milking. In this connection it is worth mentioning the opinion of the General Secretary of the National Milk Producers Association, who pointed out in our interview that,

The term 'family farmer' is not so accurate in the case of Uruguayan dairy farmers, because as soon as the farm's economy gives them a chance, they contract a milker to carry on with the 'hard' work.

Although my empirical data cannot confirm the accuracy of his statement, I think there is some truth in it, even though it is not so much 'hard' work, as 'undesired' work that households would attempt to avoid by contracting waged-milkers. It is true that the two cases noted above were among the most well-off family farms. More important is the

⁸³ This was the case also with one of the dairy working teams I followed during my fieldwork. For more than a year the original tractor and its agricultural equipment had been useless. The farmers who collectively own collectively the tractor could not agree on how to divide the future debt for repairs, because of their different financial circumstances. The negative consequences have been significant not only for these partners (who could not rely on this equipment for themselves and as a source of extra income by renting their service), but also for a couple of more recent associated members who rely on the hiring of this service at low prices.

fact that most dairy farmers, especially women, expressed their wish to be able to pay somebody to perform the milking routine. According to them, there would follow an increase in their 'free-time' to spend on their own and with their families (see chapter 5)⁸⁴. My point is that the apparent avoidance of commodified labour relations among family farms might not reflect any kind of inner cultural model—as suggested by many advocates of the idea of a distinct, traditional peasant rationality—but rather should be seen as the result of particular socio-economic contexts of action (see Archetti 1975). The family farms I studied have experienced periods of bonanza when waged-workers were normally contracted, while in times of crisis, they have relied on their own labour force. Furthermore, not only the external context, but also intra-household situations like pregnancy or the migration of the younger generation, might lead to the development of more 'commodified' labour relations. The presence of a capitalist labour market is the wider context that allows for the pendulum movement between non-commodified and commodified social relations of production in the concrete setting of the family dairy farm.

Another important commodified labour relation has gained significance in the last decade of dairying in the area under study; namely, in the hiring of agronomic and veterinary advice and services. In the previous chapter, I noted that the spread of new dairy techniques and management practices among former crop farmers was partially achieved by the activities of a significant number of extensionists working for *Conaprole* and, on a minor scale, other official institutions (e.g., INC; also the currently non-governmental *Instituto Plan Agropecuario*). In the case of the Co-op, there have

⁸⁴ In a survey conducted in 1995 among 400 *Conaprole* dairy farmers, a significant number expressed the same feeling. For instance, one of them clearly remarked: '*The problem with a*

been two main modalities of rural extensionism. On the one hand, agronomists received farmers for consultation in the so-called 'Regional Centres' [*Centros regionales de extensión agropecuaria*]. Villa del Rosario's family dairy farmers used to travel to the nearest centre in San Ramón to meet the agronomist on duty (plate 7). Occasionally, agronomists travelled to the farms to observe how things were going on. This service used to be free of charge⁸⁵.

On the other hand, one of the main assumptions behind the formation of dairy farmers' working teams since the late 1980s has been the notion that scientific agronomic knowledge can be better transmitted from extensionists to farmers if they meet on a regular basis, at least once a month. The Co-op encouraged the formation of working teams by paying a bonus to those dairy farmers who joined up (the so-called *prima por agrupamiento*). At the same time, the institution has promoted and facilitated the contracting of technicians. The Co-op pays part of their salaries while farmers pay the rest, which is a percentage of an individual's income⁸⁶. In this way technicians are, at least in theory, motivated to push up 'their' farmers' productivity and milk quality. In every group there is an agronomist, but a veterinarian has been increasingly contracted, too. According to Tomassino (1994), agronomists have a more holistic training than veterinarians. Thus, they are regarded as better qualified to give technical and managerial advice to dairy farmers, whilst veterinarians might be called when necessary

dairy farm is that nobody likes to milk, including myself. Dairy farming is a slaves' job and one of the less profitable in the country' (Piñeiro, Chiappe, and Graña 1996: 110).

⁸⁵ During fieldwork many of these regional centres, including the one I mentioned, were closed down by the Co-op directory to reduce costs. This measure was strongly criticised by smaller dairy farmers who saw it as the creation of a new gap between them and the decision-making managerial staff. Rural extensionists, they said, worked as an information bridge between the agricultural and industrial levels of the agribusiness complex.

and paid for reliable services like artificial insemination, deliveries, and sanitary treatments. Elsewhere in this thesis I show that the relations between farmers and technicians might involve aspects other than just a pragmatic evaluation of their knowledge and practices (see chapters 5 and 6). Here, I just want to draw attention to the fact that many family farms in Villa del Rosario do, objectively, pay for technical advice. Therefore, we are in the presence of a commodified labour relation between farmers and technicians. However, the labour relation cannot simply be assimilated to a capitalist-worker one, as might be said in the case of contracting milkers. Firstly, as in the case of agricultural services or 'works with tractor', the technician owns and controls his means of production, namely practical and theoretical scientific knowledge concerning agriculture and/or animal health. Secondly, therefore, the farmer—or group of farmers—is not in control of the technician's labour time. They do not 'exploit' him/her in the pure economic sense. Indeed, because of the high social value attributed to intellectual labour and its increasing importance in the daily production process, it seems that the relation of domination and control of labour is sometimes turned against farmers, even though they are the ones who pay. The commodified character of the relationship between dairy farmers and extensionists is an issue not very often analysed in studies of the social relations of family farming. I myself only became aware of this somewhat hidden circumstance after a period of participant observation, while in my interviews with an open questionnaire, none of the respondents who paid for their technical advice included the extensionists as hired labour.

⁸⁶ The seven dairy farmers who are members of the Villa del Rosario working team were paying, in 1998, around US\$25 a month to each of their two technicians, which represented 312 litres of milk per month to get their advice and services. On the other hand, then, each technician was earning in the region of US\$175 a month directly from the whole working team plus the part

Engagement in waged-work

Let me now turn to commodified labour relations that involve dairy farmers' off-farm work. This can be divided into permanent and temporary jobs (see footnote 82). Table 8 shows who, among surveyed family-farmers, engaged in off-farm waged work according to generation and sex.

Generation and sex	Type of off-farm waged work	
	Permanent	Temporary
Head of household (man)	2	7
Spouse (woman)	1	3
Young boys	2	7
Young girls	2	1
TOTAL	7	18

Table 8. Number of individuals who performed off-farm waged-work in the 1997-1998 year, according to generation and sex.

Source: Fieldwork.

Men, including heads of households and sons, engaged more than women in waged work in the surrounding rural area. Most of them leave and return to their farms on the same day over the period of off-farm work and, in principle, this does not interfere significantly with their own work on the farm. Indeed, according to my informants, off-farm work has diminished since the development of modern dairy farming. Moreover, those who do engage in permanent waged work do so on a part-time basis, and then not far from their farms. Those who are temporarily contracted receive a piece-work or a day-work payment. Men might perform similar tasks as they do on their own farms: tractor work, baling, fencing, manual maize harvesting, artificial insemination and cattle driving, to mention just the most important jobs. Two heads of households and a young boy were contracted for their more specialised skills: as an otter hunter, house

paid by the Co-op, which is 2.5% of the total production of the team up to a maximum of 50,000 litres of milk.

builder and engine mechanic. There is an average payment for particular tasks, though it is often a negotiated deal⁸⁷. In general terms, it is an irregular source of income. Young boys keep their payments for their own expenditure, though sometimes they might decide to share it with the rest of the family.

Women engage in off-farm waged work less often than their husbands, sons or brothers. When they do so, they normally move to towns and stay out of the farms longer than men. I have already mentioned the case of seasonal domestic services. This was the only available temporary waged work for women⁸⁸. Those who were employed permanently (3 women) worked in Minas. One of them was a secondary schoolteacher and the other two girls worked as domestic servants.

Summary

From the above description of the technical and social aspects of modern dairy farming as developed in Villa del Rosario, we can draw a series of common trends, despite the distinctive nature of each family dairy farm.

⁸⁷ Tilling with the tractor was paid around US\$1.6/hour (summer 1998). The eldest son who was mentioned in the exceptional case of intra-farm commodified labour earned in 1997-1998 around US\$3000 (summing all his temporary and seasonal jobs).

⁸⁸ The monthly salary in Punta del Este, the main tourist resort, is between US\$600-US\$1000 (summer 1998), depending on the kind of jobs (cleaning, cooking, etc.) and 'antiquity' of the relation with the employer.

Firstly, the form of production is a combination of extensive livestock herding with an increasingly intensified agriculture, the latter especially seen in those farms with less available land (Ferrari and Lazaro 1990)⁸⁹.

Secondly, there is an economic need to increase the amount of milk produced on the farm with the reduction of the price received per litre of milk (the so-called 'paradox of the dairy farmer'). Dairy farmers respond to this challenge by increasing their herd of milking cows and improving the provision of forage for each lactating cow. This process means a search for a delicate balance between the number of animals and the availability of fodder, dependent on the seasonal rhythms of plant and cattle growth, as well as financial opportunities to buy animals or fodder in the market if this is necessary. Having said that, the presence of two 'types' of milk—'quota' and 'industry' milk—with different market prices works as a counter-weight, leading many small dairy farms to produce just the amount of milk required to retain the assigned (and subsidised) quota, which represents a higher average price received per litre of milk⁹⁰. Nevertheless, local people have to cope with new debts arising from changing conditions of production (e.g., veterinary products, petrol, taxes) and living expenses

⁸⁹ An indicator is the difference in the objects of rural credit applications between poorer and richer dairy farms. In 1992, the former used 20% of the total loan applications for cultivating artificial meadows; whilst the latter only 8% (FIDA/MGAP 1992).

(e.g., telephone bills, transport) that push them to increase productivity in milk production, in addition to other temporary strategies to improve farm income (see Noske 1989: 25, for a similar trend among British and Dutch farmers).

Thirdly, and closely related to the above point, there is a trend towards a market-oriented diversification of production. The production of milk became the economic basis to sustain the household, yet other alternative sources of income are in place, including beef cattle herding and pig raising. On the other hand, it seems that the production of staple food exclusively for domestic consumption has declined. The case of horticulture is paradigmatic. More and more people normally buy vegetables and fruit from groceries or even rural schools. Along with diversification of market-oriented production, most family farms rely on temporary waged work and/or official social benefits to complement their incomes from agriculture.

Fourthly, there is an increasing fragmentation of the process of production that goes hand with hand with the 'externalisation' of several partial processes. For instance, cows and calves' concentrates are brought from outside the farm, as well as frozen semen; agricultural machinery and skilled labour for harvesting and baling are hired;

⁹⁰ Stanek (1993: 43) points out that the establishment of a milk quota among Canadian dairy farmers has led to increased productivity, alone with attempts to 'buy' new quotas. The difference between Canadian and Uruguayan dairying is that the quota system in the former country aims to stop overproduction by allocating the maximum quantity of milk per unit of production that will be received by the dairy industry; while in Uruguay, the quota system has been used to guarantee the satisfaction of internal market consumption of fresh milk, hence to avoid underproduction of milk on the farms. Having said that, in Uruguay the allocation of more quotas than the minimum received by every member of the Co-op (60 litres/day), depends on productivity. Nowadays, milk quotas are 'left' vacant by those dairy farms that go bankrupt. Then, larger dairy farms try to appropriate these freed quotas (that represent an extra profit) by augmenting their remittance of milk to the dairy which in turn gives them priority in the redistribution of the fixed national quota. Thus, the observed limitation of production of milk among small family dairy farms responds more to a contingent cost-benefit analysis, rather than

veterinary and agronomic knowledge is put into practice through the advice of experts. Consequently, there is a trend towards a more extended social division of labour and the specialisation of skills. Having said that, it is possible also to observe a counter-tendency among poorer dairy farmers. Through formal and informal training, farmers still possess a great many of the intellectual and manual skills needed to control the whole process of dairy farming. Indeed, instead of the externalisation of partial activities, it seems that there is a complementary process of increasing the technical division of labour along with a redistribution of tasks and knowledge among family members, which might act as a catalyst for co-operation between generations and sexes. Undoubtedly, mutual aid between farms also helps to spread knowledge and skills. Nevertheless, some objective technological changes in the process of production seem to weaken farmers' chances to 'internalise' skills. For instance, much needed sophisticated agricultural machinery—which is designed to be used in other social and ecological contexts (Llambí 1988: 367; Cushman, Diverso, and Villaverde 1995: 21)—cannot be afforded by individual farms and must be collectively owned or hired, which has called for an expert machinist (see Augsburger 1990). The same could be said about the use of hybrid seeds and chemical inputs, manufactured off the farms, that have led farmers to depend on expert evaluators and extensionists. In short, modern dairy farming bonds family farmers increasingly to other local, national and international agents, in what Archetti has called 'strong industrial integration' (1983: 93). Among Co-op members, the institutional mediation of *Conaprole* is clear, acting as a buffer for many negative effects of such interdependency. Simultaneously, it does also represent the narrowing of individual choices. The Dairy Co-op, as an example of a particular type of agribusiness integration, 'set up demands for a given quality of

a permanent dynamic. It is not a matter of differential rationale but rather a question of the scale

products, regular deliveries, specific hygienic conditions of the production process, rational management, and so forth' (Archetti 1983: 93). Furthermore, this narrowing in the farmers' scope for decision-making is reinforced by increasing the dependency and indebtedness of farmers to public and private financial capital through the Co-op (FIDA/MGAP 1992), leading to their further integration into a kind of 'putting-out system' (Carrier 1992). (See also Fitzgerald 1991: 115 for the United States.)

Fifthly, the organisation of labour in family dairy farms shows a combination of non-commodified and commodified relations of production. Contracting permanent waged workers is exceptional, while the contracting of agricultural services follows seasonal needs for heavy machinery (e.g., harvesters) or human labour. I believe the distinction between kinds of labour relations involved in the different labour processes, including household chores, is useful to throw light on the differential practical relationships of people with non-human components of the environment. I suggest that the increasing commodification of labour relations, which entails an increasingly mediated process of environmental transformation, might lead to a rather estranged way of relating with the environment. Thus, there would emerge a more objectified 'Nature', as an external domain confronting human action. In other words, I shall contend that the gradual commodification of labour relations represents a cultural disembedding not only of human labour, but also of the non-human environment. I would suggest that family farmers integrated into the dairy-agribusiness have to cope with both the estranging consequences of the use of new agricultural technologies and the estranging consequences of commodified labour relations, in their attempt to keep social control over the processes of production and their material results.

Sixthly, the current economic circumstances—and structural limitations of household estates—push family members, especially youngsters, to seek waged work in agriculture or other activities. Youngsters come back to the family estate regularly when engaged in temporary jobs, yet many of them (mainly women and non-successor men) will definitely abandon the farm when forming their own families or even before.

Finally, the gender division of labour shows the continuation of the traditional pattern of men being responsible for fieldwork, cattle management and machine maintenance, while women take care of the farmstead and surrounding area, and child-rearing. Nevertheless, the increasing involvement of women in milking and the nurturing of calves has put them in a more prominent position with regard to decision-making on the farm, and consequently the role of women in the 'formal' rural economy has begun to be recognised. In addition, women's skills provide the basis for the development of alternative sources of income (de León 1993: 15).

This general overview of the form of production in dairy farming has had as its aim to provide the context for further elaboration of peoples' evolving transformation and perceptions of their physical and social environments. Moreover, my analysis shows that the technical and social domains are intimately interwoven and synergistically constituted: technologies embody particular social relations; social relations embody particular technologies.

Plate 7. *Conaprole* milk processing plant in San Ramón.

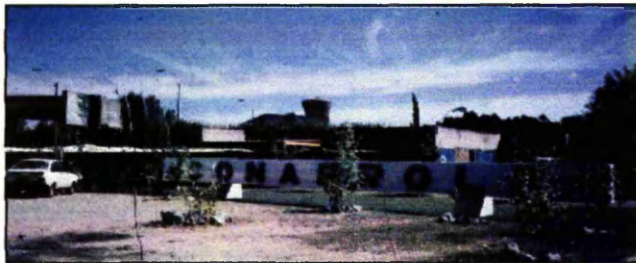


Plate 8. A portray of four generations of farmers dwelling in a dairy farm.



Plate 9. New technology for storing forage: humid silage.

Chapter 4. The perception and meanings of places in the environment

Introduction

The environment for a person or a group of persons is not chaotic. It is structured in particular patterns which different subjects through their actions and according to their skills can perceive, and to which they can relate. Some of these patterns are designed as 'places'. Gibson wrote,

The habitat of a given animal contains *places*. A place is not an object with definite boundaries but a region. The different places of a habitat may have different affordances. Some are places where food is usually found and others where it is not. There are places of danger, such as the brink of a cliff and the regions where predators lurk. There are places of refuge from predators. Among these is the place where mate and young are, the home, which is usually a partial enclosure. (1986: 136)

He also added,

[...] smaller places are nested within larger places. They do not have boundaries, unless artificial boundaries are imposed by surveyors (my piece of land, my town, my country, my state)[...] A very important kind of learning for animals and children is place-learning, learning the affordances of places and learning to distinguish among them—and way-finding, which culminate in the state of being oriented to the whole habitat and knowing where one is in the environment. (ibid.: 240)

Significant places, then, are 'attractors' (Lewin 1992) in peoples' environment that invite the performance of particular activities and at the same time help people to know not only their geographical whereabouts but also their socio-historical 'emplacement' (Feld and Basso 1996; Casey 1996: 31). Or as Thrift points out,

[Places are] socially constructed parcels of time-space [where] 'subjects' and 'objects' are aligned in particular ways which provide particular orientations to action [...] and particular resources for action (which will be more open to some subjects than others). (1996: 43)

It should be noted from the above quotation that places and their resources might not be appropriated by all people to the same degree. Indeed, the perception of places always involves differential access to what they afford and consequently their potential transformation according to people's changing needs. Reed states that

[...] because we live in a shared environment, a social environment inhabited by others of our kind, direct perception is not necessarily private. Privacy of perception and action is possible, by means of occluding edges and their use in preventing information from becoming available to others. (1988b: 151).

Consequently, in this theory of places, a political dimension is implicit.

In this chapter, I shall draw attention to the material and symbolic transformation of places among dairy farmers and other rural agents in the context of the modernisation of life in general, and particularly of agricultural practices. My aims are twofold. Firstly, I want to show that people clearly dwell in, and identify, a series of nested places whose boundaries are flexible, though in a historical perspective some of them acquire relatively more persistence. Secondly, I attempt to show that the tacit knowledge involved in perceiving places is increasingly objectified in forms that approximate to the idea of 'space'. In other words, I intend to describe the processes of abstraction and detachment of people from places. Abstract space, as I use it here, means a notion of a territory 'devoid of landmarks or any privileged centre' (Bourdieu, in Gell 1985: 272), where the subjects and their interrelations have somehow disappeared. In other words, a perception of space might involve 'some abstracted inventory of [Nature's] contents, in which items are cognitively detached from their habitat and reorganised according to a limited number of morphological or functional criteria' (Ellen 1996b: 110). I argue that growing up and living in certain economic and social contexts might lead to the emergence of a conceptualisation of the environment as 'abstracted space' against

'practical space' (Bourdieu, in Gell 1985: 272), even though it does not preclude at all the direct engagement of people in their environment. It is my contention that in the context of modernisation, local people increasingly think of their environment as separated from them, as an entity that is being, or could be, alienated. However, I suggest we should differentiate between two notions of space in the current transformation and perception of the environment among local farmers. On the one hand, there is the emergent idea of space as derived in a dialectic relation from people's direct experience with the environment, or what could be defined, following Lefebvre (1991: 165), as 'appropriated space'. On the other hand, there is a notion of space whose source lies in administrative and financial arenas far from the reality of local people's practical engagement with the human and non-human components of their particular environment, but which is destined to be imposed upon this reality. This latter notion of space is a conceptual tool that, when put to work in practice, might transform peoples' places in a very disruptive and unpredictable way, because it focuses only on a partial dimension of a complex environment, producing a 'dominated space' (Lefebvre 1991: 164-5). The relations and tensions between place, appropriated space and dominated space will now be addressed.

The meanings of a dairy farm

A typical dairy farm could be considered as the enclosure of land where different nested places afford the particular activities that people carry on in daily life. In figure 4 are shown in schematic form the principal domains of a farm: '*las casas*' (translated as farmstead or household compound), and '*los campos*' (the fields). For my purpose of analysing the new meanings of places, I shall focus on the most salient changes in each

domain in recent times. In the domain of *las casas*, I centre my analysis on the residential house and the milking parlour. On the other hand, in the domain of the fields, I draw attention to the new forms of tilling the land. Then, I shall return to the novel meanings of the farm as perceived and stated by local dairy farmers.

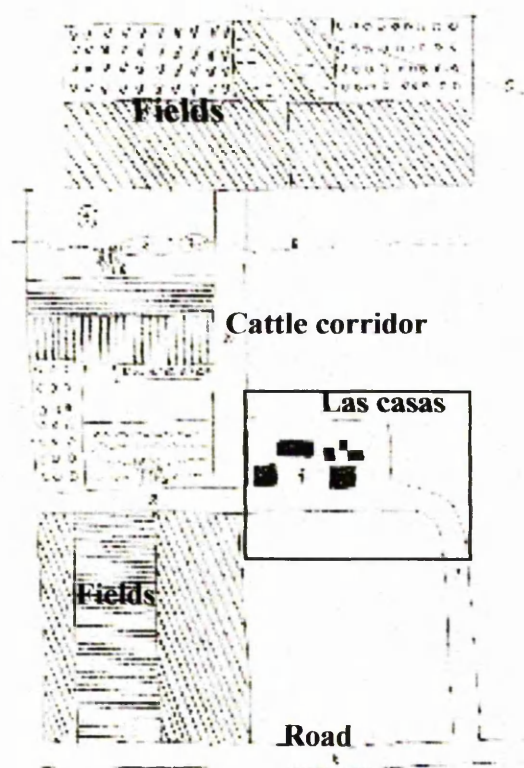


Figure 4. A schematic layout of a dairy farm: 'las casas' and the fields.
(Based on a farmer's design)

Las casas

The house

Most family dairy farmers in Uruguay are sedentary producers in the sense that for the greater part of the year, they wake up in the same bed, in the same room of the same house, and work the same fields. Even when they leave the farmstead and immediate surroundings to travel elsewhere (for work, leisure, or any other activity), they normally come back to have dinner and rest at night at the family household estate. Moreover, when a family member does engage in temporary jobs and has to stay away from the farm for a certain period, he/she always has the farmstead as a point of the reference to

travel back to when the job is over. The farm in general, and the farmstead in particular, are the material and symbolic centre of the family dairy farmers' world⁹¹. (See Leroi-Gourhan 1971: 316, for a comparison between hunter-gatherers' and sedentary farmers' concepts of space; also Tapper 1988: 54.)

According to the literature, until the second half of the 20th century, there was a distinctive rural dwelling among poor families (Wettstein 1969: 42; Chiarino and Saralegui 1996: 210). This was a house of a temporary nature. Houses were built mainly with local materials and had walls made from clay blocks and roofs of straw [*quinchado*], delineating a typical *rancho de barro*. Chiarino and Saralegui wrote that,

The lack of attachment to the land leads peasants to build just a rustic *rancho* for their family whilst staying on a plot. Not only because agriculturalists know that their permanence there is relatively ephemeral, but they also know that the landlord will not compensate them for the house they build when they depart from the exploited plot. Hence, when moving, and after taking its doors, windows, and any useful parts, they destroy the *rancho*. (1996: 246)

In Villa del Rosario, this was the situation among family crop farmers until they were able to buy their land or become tenants of official lands from the 1950s on, as shown in chapter 2. Therefore, a stronger feeling of belonging to the land and the establishment of a permanent 'home' have emerged. Yet, the sense of attachment to a particular piece of land is not absolute, but relative to both the economic feasibility of the family enterprise and inter-generational co-operation. There is a permanent

⁹¹ It must be stressed that my account reflects the experience of the typical family household in contrast to the situation in a non-family rural enterprise. In the latter, the landlord might not dwell on the farmstead, but rather travels regularly from the city to his/her plot to control the performance of waged workers. However, the particular cases are very heterogeneous. There are cases where a landlord delegates most of the control to a foreman who works with single waged workers. On the other hand, there are farms where a nuclear family is contracted, whose members work the land and carry on cattle management in a way that does not differ significantly, in a technical sense, from a family household that owns the means of production. I believe that many of my findings would apply also to this latter case, though there are still important differences in the sense of where 'home' is.

ambivalence between the experience of being freer to shape the form and content of a farm, and the enduring feeling that one day the family might have to move away and look for better horizons elsewhere.

This contrast between the attachment and disengagement of people to their land is expressed in the actual design of residential houses and the household compound. I should make it clear that I am not taking the house and other buildings as 'classifying systems' that 'inculcate and reinforce the taxonomic principles underlying all the arbitrary provisions of [a] culture' (Bourdieu 1998: 89). Rather, I see the building of houses and barns as the material objectification of the changing relations between people and between people and the physical environment through time⁹². My analysis of the house and the farmstead aims to introduce a less static relation between built environment and culture. Particular groups of people might share a common ideal of the world and they would try to make it happen, but it seems that in practice, the constitution of the built environment at the farm level responds more to people's coping with the changing physical and social environment than to the imperatives of a received cultural tradition.

⁹² Anthropologists and other social scientists have 'read' in the design of houses and other buildings a set of limits and possibilities as 'models for action' (Wilson 1988) or 'systematizations of thought' (Rapoport 1969). For instance, Rapoport argues that, 'Buildings and settlements are the visible expression of the relative importance attached to different aspects of life and the varying ways of perceiving reality. The house, the village, and the town express the fact that societies share certain generally accepted goals and life values. The forms of primitive and vernacular buildings are less the result of individual desires than of the aims and desires of the unified group for an ideal environment. They therefore have symbolic values, since symbols serve a culture by making concrete its ideas and feelings.' (1969: 47) My ethnography shows that there might not be a unity of aims and desires towards an 'ideal environment'. On the contrary, I found that individual families were constantly re-evaluating what their ideal environment might and ought to be.

The designs of current houses and compounds among family farmers in Villa del Rosario are very heterogeneous, depending on economic resources and personal options⁹³, and on whether the buildings are inherited. Nevertheless, it is possible to find some common features. The house normally has the main entrance, or front door, facing the entrance to the farm from the road, while the back door, if there is one, communicates to other buildings in the household compound. In general, smallholders have built their houses near the road at one end of their farm, though it is not exceptional to find houses relatively far from the roads and on more elevated terrain in order to have a better view of the fields (see Solari 1958: 206)⁹⁴. The walls of dwellings are made of hollow concrete blocks or bricks, generally covered with a layer of lime both on the outside and on the inside. The outside might be painted in temperate colours. In each wall there is, at least, one window with glass that affords visual engagement with the surroundings. The ceiling is generally a heavy concrete surface covered by an inclined roof made of corrugated sheets of zinc, or otherwise covered with red tiles. Floors are made of concrete, sometimes covered with paving tiles. Most materials used in the building of the houses, and other buildings in *las casas*, are brought from the city. Local materials like wood might be obtained from in-farm resources, though not necessarily. It is common, also, to re-use old parts of derelict or abandoned barns for new constructions. In the front of the house, there is normally a

⁹³ In terms of who builds the house (and other buildings), we could talk of a 'pre-industrial vernacular' type of building when a farmer is 'very much a *participant* in the design process, not merely a *consumer*'. (Rapoport 1969: 4). Normally, a building tradesman co-operates with farmers in the construction of a house, but there is no gap between the designer of the house and the user. To be more precise, it is not 'everyone' who knows and builds a house, but mainly men. Nevertheless, women might contribute with ideas on spatial arrangements and, sometimes, with their labour.

small garden with various plants, flowers, and a few fruit trees, that women take care of.

Houses have only a ground floor. Although the plan of the house differs between households, there are still certain common spatial arrangements (see figure 5). There is normally a spacious kitchen encountered as soon as a person comes into the house through the front door. The kitchen might be said to be the 'heart' of the residence. In many houses, despite the generalisation of gas-cookers, women have retained a more traditional firewood cooker (the so-called *Cocina Económica*) on which to cook, bake or, simply, to boil water for *mate* (Plate 11). It also helps to warm up the room during cold days. Undoubtedly, the kitchen is the busiest place in the house. It is regarded as a female domain, because women do most of the work there, though men might help to 'make the place', for instance by fetching firewood for the cooker, or just stay in watching TV, listening to the radio or chatting. Also, men are in charge of any necessary repair of the material structure of houses (i.e. roof, walls, and floors).

⁹⁴ What in principle might be seen as an advantage of this house location in terms of better control, mainly, of what is going on in the fields, has more recently represented a constraint on production and household comfort. The geographical distance between the farmstead and the road means that it costs more to be connected to the electricity grid, which not everybody was able to afford. Certainly, physical distance in this case objectifies social distances between poor and wealthy farmers.

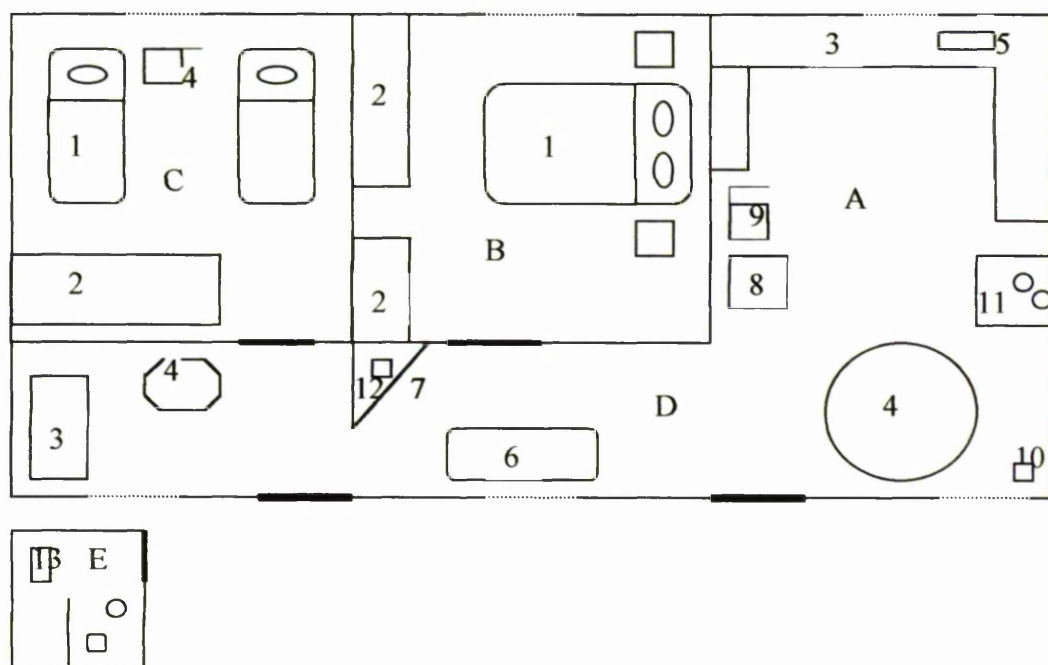


Figure 5. Layout of the plan of a house.

Key: A. Kitchen; B. Parents' bedroom; C. Children's bedroom; D. Living room; E. Toilet and shower; 1. Bed; 2. Wardrobe; 3. Cupboard; 4. Table; 5. Sink; 6. Sofa; 7. Fireplace; 8. Freezer; 9. Refrigerator; 10. Telephone; 11. Gas cooker; 12. TV set; 13. Washing machine; filled line=door; dotted line=window.

The toilet and shower are normally together and, increasingly, inside the house. It is still common to bring water from outside the house to flush the toilet, but installation of pipes in the house is becoming more general⁹⁵. Warm water might also be brought into the room in order to take a shower using a traditional camp shower [*ducha de campaña*], though the use of electric boilers has increased⁹⁶. Otherwise a cold shower or body washing is the rule. As with the rest of the house, the tidying of the toilet is the responsibility of women.

⁹⁵ On several occasions I observed men not using the toilet-place but hiding in a nearby bush in order to perform their bodily needs. They stated that it is more 'practical' and also reduces the risk of filling up the cesspool.

The spatial location of bedrooms does not follow a common pattern. The number of bedrooms in a house depends primarily on family size and childrens' ages. It seems that in many cases bedrooms were built following the arrival of new children, by expanding the area of the residence or sub-dividing a previous room. Adult couples have their own bedroom and children might share one until they grow and move to their own room. Access to bedrooms is generally through wooden doors that are normally half open during the day, and closed whilst people are sleeping. Though bedrooms are mainly used to sleep in during the night or during a siesta, they are also the most intimate domains in the house for individuals. Although the average family has between 3 and 4 members (INEa 1997: 17), the number of bedrooms and beds in almost every house I visited affords room for many more people. The first thing that is apparent is the out-migration of family members. Frequently, I was 'introduced' to family members who had left the farm, through photographs taken when they were younger, which are commonly hung in their former bedrooms. Instead of pictures, there might be formal education or training diplomas, which also show the high valuation placed by families on their members' educational records. On the other hand, the availability and maintenance of spare sleeping room might be a response to the frequent return of relatives to visit the household estate. (When I asked people if I could stay at their farms during my fieldwork, they always had to think if any visitors were coming during those days, especially when they coincided with official holidays.)

⁹⁶ I found it quite surprising that in many houses where there is connection to the electric grid, families did not install an electric water boiler. It is not that people prefer to take a cold shower after a hard working day, but rather an electric boiler is an appliance too delicate for the hard underground water used in the farmstead. Normal boilers might accumulate crust in the pipes or get easily rusted. On the other hand, boilers made of more resistant materials are too expensive.

The interior decoration of a house is simple. I found three common objects hanging on the walls: a wall-clock, annual calendars (sometimes from previous years), and family photos. Other elements of decoration are plants (natural and plastic ones), catholic images or symbols (e.g. a rosary), pictures of animals and country landscapes, and drawings made by children at school. The interior of the house is, mostly, a place for people. The only animals allowed to stay in the house are cats, which are not only regarded as friendly pets, but are kept to hunt mice both in the house and in nearby barns.

The above description of the house design might indicate people's continuity on the farm, and certainly peoples' attachment to the land. On the other hand, the interior design of a typical house also shows traces of out-migration, and consequently the detachment of certain people from the household estate. Despite the common features noted above, nothing resembling an 'underlying cultural model' seems to guide the current design of the house on family farms. What seems apparent is the gradual transformation of any archetypal 'rural' dwelling that might have existed to an 'urban' model. More importantly, the houses show a high degree of personal choice, limited mainly by the household's economic resources. I would suggest that the house, as well as the household compound as I shall show below, do 'serve the needs and possibilities of a group' (Lefebvre 1991:165). Lefebvre pointed out that

Peasant houses and villages speak: they recount, though in a mumbled and somewhat confused way, the lives of those who built and inhabited them (...) It should be noted that appropriation is not effected by an immobile group, be it a family, a village or a town; time plays a part in the process, and indeed appropriation cannot be understood apart from the rhythms of time and of life. (1991: 165-6)

This temporal dimension in the emerging meanings of place becomes clearer through an analysis of the structure of the household compound, and of the current distribution of houses in particular. The spatial distribution of dwellings in the household compound might also be an expression of peoples' attachment to the land, as well as a representation of newer inter-generational relations. The co-residence of more than one nuclear family is a response generally to the succession cycle of the household estate, as seen in the previous chapter. More often than not, two or three generations of farmers may be observed living in the same compound, though not under the same roof. I shall illustrate the relation between the spatial arrangements of the residences and family cycles with a particular case.

When Andrés's great grandfather arrived from Spain in the last decade of the 19th century, he settled in the province of Canelones. From there, one of his sons (Andrés's grandfather) moved to Villa del Rosario at the turn of the century and illegally occupied a plot on an *estancia*. He stayed there whilst engaging in sharecropping with the landlord. In 1951, the Colonisation Institute expropriated the land and leased it to the occupiers. The plot was then subdivided into three parts of around 30 hectares each. Andrés's grandfather kept one of them, his uncle a second one, and the remaining one was given away to another colonist. Later on, in 1969, Andrés's grandfather signed an agreement with the INC making him fully entitled to the land. However, it was not until 1993 that the land was transferred to the family as private property. After the death of Andrés's grandfather, his successor Alonso (Andrés's father) became the head of the household and owner of the land. Nowadays, Andrés and Alonso work the land together. However, in 1997, Andrés bought a new plot of his own.

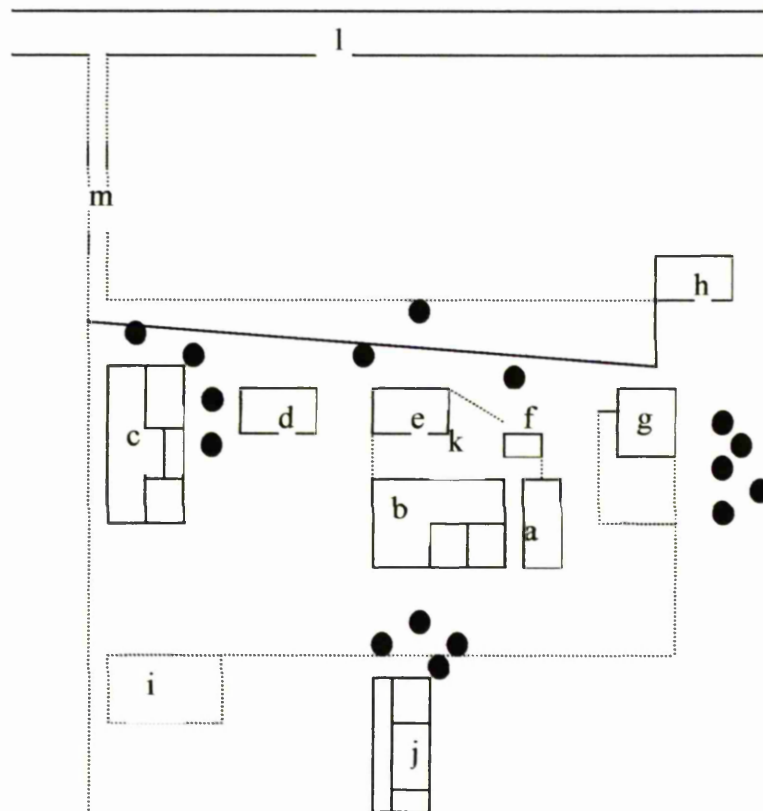


Figure 6. The houses and 'las casas' area in Andrés's dairy farm

Key: (a) Aida's house (grandparental house); (b) Alonso and Adela's house (parental house); (c) Andrés and Alicia's house (successor's house); (d) grain storage barn; (e) old kitchen, current changing room and bike shed; (f) toilet and shower; (g) milking parlour; (h) fodder storage shade; (i) orchard; (j) pig-pen; (k) garden; (l) main road; (m) lorry's entrance; black dots represent trees; dashed lines represent wire-fences.

This household history is anchored in the spatial distribution of residential houses. In the above figure, houses (a) and (b) represent the co-residence between Andrés's grandfather and father (Alonso). The oldest house (a) is made of wooden walls and corrugated sheets of zinc and is where his grandfather lived. Nowadays, Adela's

(Alonso's wife's) mother lives there, having moved in when she became a widower. She helps her daughter with the housekeeping and shares meals with her and Alonso. On the other hand, the current parental house (b) is newer, bigger, and made of more durable materials. The physical distance between them is minimal, though they do not intercommunicate. The toilet and shower (f) are shared by (a) and (b) dwellers. Andrés's house (c), on the contrary, was built at a greater physical distance (around 30 metres) from that of his parents. Andrés had lived for 31 years in his parents' house. His elder sister left the farm and moved to town to study, and then she married a man from the town and settled in the city. In 1996, Andrés married his current wife, Alicia, who was born in the area, near Ortiz train station, but was a toddler when her family moved to Minas in the late 1960s. Indeed, Alicia is a distant relative of her husband, though they did not know each other before they met at a dancing party a couple of years before their marriage. Because their own house was not built at the time of the wedding, they lived separately for almost a year, even though their son was born in 1997. At the end of this year, Alicia left her job at a factory and moved with their son to her husband's farm. The young couple lived temporarily in the parental house for a couple of months. Finally, in the summer of 1998, the new house was ready to move in to. A simple house-warming party was organised, with the presence of a Catholic priest who blessed it. As I was told, the new couple were seeking more privacy. The orientation of the house with its entrances facing the road and the fields, instead of towards the other houses, reinforces the idea of autonomy. Moreover, though the preparation of meals might sometimes be shared, generally each nuclear family has meals on its own. Indeed, household domestic expenditures are independent, too. On the other hand, however, the 'physical' distance between generations is shortened by other kinds of daily exchanges.

For instance, besides co-operative work in the production process, child-minding is also a bridge between generations.

The above example shows the desire of the successor's (Andrés's) family to stay on the farm, as well as his parents' desire to have him close by, giving continuity to the household estate. I would suggest, however, that the distribution of residences in space reveals an increasing concern to separate nuclear families and generations. There seems to be a greater distinction between the sphere of work and consumption in terms of inter-generational relations. Family members of different generations co-operate in working tasks, while consumption has been focused around the nuclear family. Nevertheless, the limits are flexible and people accommodate their behaviour to particular circumstances.

The material improvements made to the residential house, as well as the creativity in adapting the spatial structure of the farmstead to satisfy new personal and family needs for more independence, show that people play an active role in shaping the affordances of the house and compound. Moreover, the transformations of these dwelling settings shows the strength of peoples' feelings towards staying in the countryside. Yet the willingness to stay on the farm is tempered by a concern for the imagined continuity of the family household. This became evident among adult couples, who expressed their willingness to stay on the farm only if at least one of their children remained there with them. Otherwise, they were seriously considering moving to town, following their children or even without them. Consequently, the co-operation between generations is a significant clue to understanding the attachment of family dairy farmers to the land as their 'home'. The meaning of the house, as a metonymy for the household estate as a

whole, is associated with the continuation of the rural enterprise. It was not rare to hear adults stating, sometimes with a clear sense of resignation, that, with the money they would make by selling their property, they would be able to buy a modest house in town and live the rest of their lives with their savings and retirement pensions. This shows a high degree of potential detachment between people and agricultural land. People's livelihoods might continue far from the family land. Conversely, from the point of view of the farmers, the land might develop without them. Farmers, somehow, do not see themselves in a relation of 'oneness' (Hutchinson 1996: 60) with their land. In other words, people might separate their sense of self from the land they actually work.

The milking parlour

In the realm of *las casas*, together with the residential house(s), we might find other salient places like a pig-pen, several storage barns, a garage, the water well or even particular places without neat boundaries to keep agricultural machinery, raise calves, or tie a horse. However, it is the milking parlour or *tambo* that emerged as the most significant nested place on the farm in the context of the reconversion process. It has enhanced the importance of *las casas* on smallholdings. The main reasons for building the parlour in this part of the farm are the proximity to the electric grid, access to the main source of drinking water and minimising the distance to the milk bulk tank for the milk lorry. Furthermore, participation of women in the milking routine has established spatial continuity between the house and this new working environment.

I shall first describe the material structure of the milking parlour and then explore its multiple meanings as place. The design and construction of a milking parlour on a

family dairy farm is likely to follow a process of pre-industrial vernacular building (see footnote 93), though the advice of more experienced rural extensionists, or even of a professional parlour builder, has been significant. Moreover, unlike any other material structures on the farm, the milking parlour on a modern dairy farm requires initial authorisation and regular control by the Dairy Co-op (or the local sanitary authorities in the case of non Co-op farmers), concerning the actual conditions of floors and walls, as well as the quality of water. Consequently, the construction of the parlour is more constrained by formal norms⁹⁷. Other elements that people take into account in shaping their milking parlours are the current and potential size of the herd, the characteristics of the milking machine, the comfort of the milkers, and, obviously, the costs of construction. The combination of these elements has led to the construction of quite different working settings, though some common features can be observed. The milking parlour is generally oriented to avoid the coldest winds blowing from the south, for the better protection of milked cows and milkers. It is generally erected on elevated terrain in order to promote the drainage of effluents (water, dung, urine, and chemical detergent) into a ravine or dell, normally through a narrow canal. The milking parlour consists of four main areas: (i) the cows' waiting room; (ii) the milking room; (iii) the room for the bulk tank; and (iv) the room or box for the engine (Figure 7).

⁹⁷ House design and construction might also be inspected by official organisations if farmers applied for a loan from an official bank for building or refurbishing.

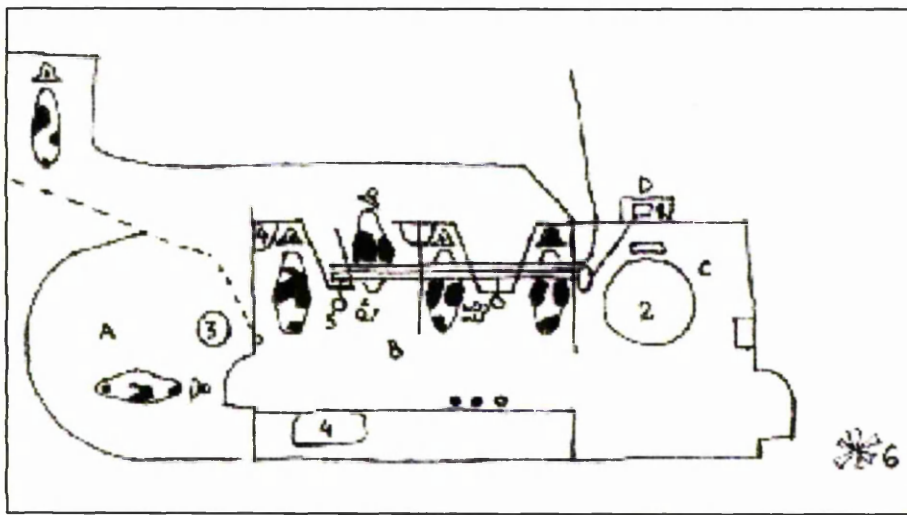


Figure 7. Milking parlour.

Key: A. Waiting room; B. Milking room; C. Tank's room; D. Engine box; 1. Engine; 2. Bulk milk tank; 3. Drinkable water; 4. Concentrates; 5. Churn; 6. Fire to boil water.

The waiting room is normally an open space, surrounded by a wire or wooden fence with a dirt 'floor'. On the other hand, the milking room and the room housing the tank have proper walls and roofs. The walls might be constructed with hollow concrete blocks or with corrugated metal sheets. Corrugated metal sheets are normally used for roofing, too. (Plate 10 and 12). Floors are always made of concrete to facilitate the cleaning-up during and after milking. In the more sophisticated parlours, there might be a trench for milkers or, more generally, the floor of the stalls would be raised above the level of the floor area of the milker by a single step to make the udders more accessible to the worker. In every case, milking rooms are lighted artificially. Among family dairy farms, the most common milking system is the so-called two stalls/units abreast [*bretes a la par*] as shown in the figure above, or a small-scale version of the herringbone system (figure 8).

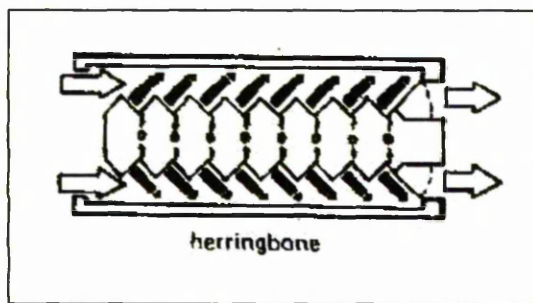


Figure 8. Herringbone milking system
 Source: Clough (1977).

The cultural meanings of the milking parlour, which are intimately related to its current material features, are threefold. Firstly, it represents a new working environment characterised by providing shelter to humans, animals and machines. Therefore, it allows production to continue independently of weather conditions. Secondly, it is the place on the farm where the practical connections between agriculture and industry become most apparent, mainly through the maintenance of hygiene standards. And thirdly, the building and daily experience of the milking parlour through practical activity goes hand in hand with the development of the self-identity of dairy farmers as specialised producers.

The milking of cows is a crucial activity in dairy farming. Undoubtedly, it could be said to be a 'key-task in the rhythmic structure of work' (Guyer 1988: 255). Its significance deserves more detailed analysis, which I pursue elsewhere in this dissertation (chapter 6). Here it is enough to present the basic features of the milking routine in relation to the constitution of an 'industrial' working environment. Lactating cows are driven twice a day from the fields to the milking parlour where milking is performed. Unlike other central productive activities on the farm, milking is performed daily regardless of current climatic conditions. Nevertheless, milkers do face different constraints on their working routine depending on the weather. For instance, the increased amount of mud in cows' teats on a rainy day requires more careful washing of udders before the

attachment of the milking teatcups. Also, seasonal variations in the quantities of milk produced by the animals might mean that the milking routine takes a shorter or longer time. Therefore, the perception of weather events cannot be underestimated in understanding the form of the concrete process of production in the milking parlour. Having said that, in more general terms, the milking process is rather similar every day of the year. Furthermore, the milkers' goal is to keep it like this in order to achieve the best possible results.

In this respect, the maintenance of hygiene in the milking parlour is a constant concern among dairy farmers, due to the required (and relatively changing) industrial standards for the quality of milk to be accepted at the processing plant. The milking parlour should be an antiseptic place, a place of cleanliness and tidiness. This is something the parlour shares with the residential house, and, not surprisingly, women are regarded as the best persons to keep the parlour and the milking machinery 'really' clean, as they do the house. However, while the condition of the house is based on interpersonal judgements and the degree of subjective arbitrariness of what it means for cleanliness is high, in the case of the hygiene of the milking parlour there is a rather objective, though indirect, standard measure. This is the quality of the milk submitted to the processing Dairy plant. The milk from a dairy farm is collected and transported by an isothermal milk tanker from the farm to the Dairy. The lorry driver, before draining the milk from the bulk tank to the lorry, takes two samples of milk. The first sample is used to conduct the so-called *prueba del alcohol* [alcohol test], when milk and alcohol are mixed in a special gun-shaped tool, to verify that milk is not rancid. If the chemical reaction is positive, then the milk will not be collected. If this first test is negative, a second sample is taken and kept in refrigerated conditions until it reaches the Dairy. A label with the

number of the dairy farm is attached to this latter sample, to identify the milk with its producers when further analysis of its qualitative features (i.e. levels of proteins, butterfat, bacteria and somatic cell counts) are conducted. Consequently, the transported sample of milk embodies the personal 'touch' of each dairy farm⁹⁸. Then, once a month, a report is sent to the farms with a quantified average of the quality of milk expressed through a rating from A to C (A being the highest standard, which is also divided into hierarchical sub-ratings with triple A being the best rewarded.) This rate shows, indirectly, not only the current sanitary condition of milked cows but also the hygiene achieved in the milking operations and the general maintenance of machinery and the working setting (see Vaillant 1998: 10). There might be seen here a process of estrangement of the milking parlour as place—and perhaps the embodied capabilities of milkers—in the sense that the evaluation of its features is divorced from people's own immediate perceptions. Moreover, dairy farmers have little to say about the standards used to judge the quality of milk, which are established by the Co-operative management following international guidelines. This manner of reaching decisions is commonly criticised by local farmers who believe the hygiene requirements are too high. Furthermore, the procedures of sample taking were a constant focus of strong debates, giving rise to suspicions about the lorry drivers' skills to conduct them⁹⁹, and anxiety over the lack of control of dairy farmers over the whole process of milk transportation. The point I am pursuing here is that the milking parlour has become an 'appropriated space'. Farmers are led to look at it in a more abstract way than is

⁹⁸ I would make an analogy between milk and children in this respect. As milk embodies the family's 'cleanness', similarly children who attend the local primary school embody the family's (and mainly the mother's) carefulness about hygiene and tidiness. This is expressed clearly in the daily efforts made by mothers to dress their children in a clean and ironed white robe and blue neck ribbon, the official school uniform, a quite hard task, bearing in mind that during school time children normally work in orchards, with animals, and play in dirt playgrounds.

⁹⁹ Not many farmers are present in the milking parlour while milk is being collected, despite their claims.

actually required of them to perform within it. Nevertheless, they are constantly moving from place to space and back again, and the unfolding of affordances is still under their personal control.

Finally, the meaning of the milking parlour extends to the social identity of the whole farm and the family. Historically, farmers have called themselves, and are recognised by neighbours and outsiders, according to their more specialised working practices. Most of the farmers I worked with were once *chacareros* (extensive crop farmers), later on *remolacheros* (sugar beet growers), and now they called themselves *tamberos* (dairy farmers). Moreover, the whole farm is called a *tambo*, and the family is known as a *familia tambera*. It is a working identity carried with pride (though not always as the really desired one, especially among youngsters). The term *tamblero* connotes, in general, hard working people, scientifically informed producers who are settled in the countryside, and progressive land users, all descriptions generally in contrast with their own past as 'backward' *Canarios* crop farmers. This pride among farmers has evolved as the result of their being able to 'survive', or even improve their livelihoods after many critical periods. Moreover, this feeling is reinforced by the social recognition of the role played by them in the 'survival' and partial dynamism of the whole area of Villa del Rosario. The milking parlour objectifies the social identity of dairy farmers, as an 'accretion of tasks into a "package", a specialized work-life-style for a person or category of the population' (Guyer 1988: 255).

To sum up, I would suggest that the milking parlour, as a singular place in a dairy farm, might be seen as the emplacement of the combined experience of the most significant recent changes in the lives of dairy farmers. It is, firstly, the objectified form of their

(asymmetrical) relations with the dairy agribusiness. Secondly, the design and daily experience of this working setting informs the make-up of their personal identity in contrast to other rural producers in the area, which in turn might be linked to the constitution of wider networks with other people in the country based on criteria of professional specialisation (more on this below). Undoubtedly, local people have shaped their milking parlours according to their needs and possibilities. Furthermore, if there is a place in the *las casas* area, outside of the residential house, where farmers envisage changes and improvements for the near future, it is the milking parlour. The latter is the objectified form of farmers' past desires and the object of future ones.

Fields

Human domination and the recovery of strength

The fields [*campo(s)*] represent the largest area on a dairy farm. Because modern dairy farming is a system of cattle herding based on a relatively intensive arable farming strategy, soils appear for people as one of the most salient constituents within the fields' environment¹⁰⁰. The current practical and symbolic meanings are rooted in people's previous experience of working the lands as specialised crop farmers. Having said that, the application of new agricultural techniques and land-use management have entailed a different relationship between people and soils.

¹⁰⁰ Morphologically, soils are characterised as a mixture of superficial and deep soils. The deep soils to the east and north of the area under study are highly suitable for the practice of crop-farming, while the stony soils to the south and east are more suitable for cattle grazing (Cayssials and Alvarez 1984; OPP-OEA-BID 1992: 10). Indeed, this heterogeneous soil configuration affords a variety of agricultural practices, but at the same time requires delicate management to avoid increasing soil erosion due to human activity, what Boerger calls "accelerated" erosion as against "natural" erosion (in Solari 1958: 238).

The 'fields' as a differentiated place on a dairy farm afford, foremost, the opportunity to cultivate cattle food. Since the agricultural and cattle management activities are performed almost exclusively by men, the *campo* is a male working domain (Plate 13). Fields on a typical family dairy farm are divided into paddocks on average not bigger than 6 hectares, enclosed by a fixed wire fence. On most farms there is a central fenced corridor [*callejón*], through which cattle and machinery are driven. Paddocks connect to this central corridor through gates [*porteras*]. Each paddock would be cultivated with a crop, or as a meadow, or a mixture of both, according to the agricultural cycle and the farm's cattle feeding strategy. Despite the variations between different families, there is a relatively common pattern of crop rotations in each paddock, alternating crops for forage with pluriannual 'artificial pastures' or meadows. (For a full account of the crop rotation and its relations to seasonality, see chapter 5.)

I would suggest that family dairy farmers increasingly see their fields as the object and result of their labour, though 'natural forces' are always considered as co-operating for good or bad. Indeed, a paddock that is not tilled is generally regarded as missing productive possibilities—surely a deplorable situation. Although extracted from another ethnographic context, I believe Frake's reflections on current English farmers might fairly but not exclusively describe the way family dairy farmers in Villa del Rosario relate with their fields:

It is improvement that makes the place. Even 'nature' needs improvement to become, or be restored to, a 'natural' place. The alternative to improvement is to let it go, to invite decay, spoilage, unruly growth, untidiness. One's place can be 'lost', but never should it be abandoned. (Frake 1996: 250)

Among modernised farmers, the positive valuation invested in working the land might have arisen historically, in contrast to what has happened on the traditional livestock

ranches or *estancias*. The latter have relied almost exclusively on natural pastures to raise cattle, and this would have constrained productivity. Barrán and Nahum (1984) wrote,

From far-off colonial days, our natural pastures had made it possible to obtain economic assets with the least technical effort and smallest labor force possible. From this point of view it was a blessing.

But, from another, nature never necessitated an inventive response from society, or required its active intervention; on the contrary it acted as an anaesthetic. It gave life to one of the specific aspects of our cattle-based civilization: an adherence to the 'gifts of nature'. It re-created an old myth of the primitive peoples and fed it with economic success that grew out of its faithful observance: only tradition is wise. (Barrán and Nahum 1984: 665)

Therefore, the extensively exploited *latifundio* had been identified by the advocates of modernisation as the main obstacle to national development since the turn of the century (Chiarino and Saralegui 1996; Wettstein 1969; Quijano 1984). On the other hand, as I have already mentioned elsewhere, *Canarios* crop farmers were also seen historically as embodying constraints on national development, due to their 'primitive' agricultural techniques and attitudes towards conservatism.

Today, people's narratives about their fields as place are undoubtedly linked to active human care of the land. Here, I am using the term 'care' to denote a sense of carefulness with, and nurturing of, the earth. I believe it refers to a current shift in the relation between farmers and the physical environment. It is not rare to find that the literature of the first half of the twentieth century, at the same time as promoting the modernisation of the countryside, uses metaphors which portray humans, and mainly arable farmers, as having to conquer Nature to satisfy their needs and become civilised. For instance in 1910, a group of official agents stated that marginal people in the countryside would be integrated and disciplined, according to the modernisation

project, when they will be able 'to perceive the warm emanations exhaled by the virgin earth as it is cut by the plough' (García Acevedo 1967: 61). The metaphor of the earth as a woman to be violently raped is clearly indicating a dominant ideology of both strong patriarchalism and a Promethean standpoint. At the turn of the 21st century, people are still using metaphorical expressions which show such an asymmetrical power relation between men and the earth, as in sentences like 'to break the land' or 'digging the plough', but people increasingly talk of a human agency as needed 'to cure' or 'to restore' Nature's wellbeing. In other words, Nature—or soils as a metonym of Nature—is still an external object to work upon. Moreover, humans are the dynamic pole of the relation, with Nature as a reactive entity. Yet, the idea of a more dialogical relation, rather than a unilateral action, seems to be gaining ground as the basis for the current notion of modernisation of agricultural practices.

In this regard, memories of the recent past have always emerged as the background for understandings of the current and desirable relation between people and the soil. Farmers would compare their current situation with that of the time of the sugar beet agribusiness, which, as already mentioned, coincided with the experience of the 'golden age' of the rural community. For my purposes, it is important to recall the main consequences of the kind of working practices in the fields at that time. One of the most significant effects of decades of sugar beet cultivation was severe soil erosion in the whole area of Villa del Rosario. The main reason was that farmers ploughed their plots following the land's gradient, aiming to drain rainwater and consequently avoid the rotting of the crop in the land and the spread of weeds. Consequently, the drained water swept aside the most superficial and organically rich layer of the soil. These are called washed lands [*tierras lavadas*]. Even in parts where erosion was not too severe, the

fertility of the land decreased. The lack of crop rotation was taken to be the primary cause. People planted sugar beet time and again in the same paddock to take advantage of previous applications of chemical fertiliser. Meanwhile, in the rest of the fields, they continued to grow wheat, maize and a few other crops without manuring, which resulted in the impoverishment of the soil¹⁰¹. It should be noted that the company's technicians advised people on the amount and type of fertilisers without any previous soil analysis. One of my informants sent a sample of soil to a laboratory to be analysed a couple of years after he ceased to grow sugar beet on his farm. The results showed him that the soils on his farm, as in most of the region, were too acid for this crop. Moreover, the physical characteristics of the soil, namely its low degree of permeability, presented other constraints due to the accumulation of water in winter and the fermentation of organic matter in summer. He concluded: *'These lands are not suited [aparentes] either for sugar beet or potatoes'*. Having said that, dairy farmers would describe the positive consequences of the growth of the sugar beet when asserting that particular plots have higher fertility due to the accumulation of phosphorus from the continuous addition of chemicals. Indeed, some producers believe that the relatively high prices of land in Villa del Rosario are partially due to this fact, though the use of chemicals continues to increase. Nevertheless, it was common to hear farmers' opinions stressing their ignorance and negligent attitude at that time. As one of them pointed out,

Everything seemed easy. There were many facilities to work. Yet, we were not fully aware of the damage we were doing to the land.

¹⁰¹ Since the 1970s the 2nd of September was officially declared the national day for soil conservation. The problem of soil erosion became so important that, after 1980, loans were allocated mainly to those farmers who had begun to practice soil conservation techniques, like the rotation of crops with leguminous meadows. Moreover, the national development bank (BROU) sent their technicians to promote cattle raising among sugar-beet producers to control

Another example of new affordances brought about by the use of different techniques and crops is the working of *blanqueales* or white spots. *Blanqueales* are spots of eroded land, which have lost their vegetation cover. However, by ploughing deeper with heavier agricultural machinery and the application of fertilisers, together with crop rotation, which gives a kind of 'active rest' to lands, these spots are now seen as 'good land' again. A young dairy farmer put it this way:

Almost nothing remains of what I learnt from my father. Everything has changed a lot, even the type of soils. Plots that in the past could not be worked, white spots, have improved considerably with the growth of meadows, and nowadays can be used in production.

My contention is that people have learnt from past experiences, and mostly from their mistakes, but also that the economic context has changed and the result has been a more 'sustainable' relation between production goals and the reproduction of the biological conditions of soils. However, there is another side to the story. The agricultural system is increasingly fragile, as shown by the need to use more chemical inputs to maintain productivity. The fragility is not only 'ecological' but also social. To maintain or improve their livelihoods, farmers have to increase the level of productivity in their fields, which has meant more debts owed to the banks. It is not a coincidence that people draw some parallels between the land and producers. As one poor dairy farmer put it when I asked him about the increasing use of chemicals in modern farming:

The land is worn out like the people. It has no strength. The earth's fatness is gone. If I don't put on fertilisers, it won't nourish plants. We need to apply fertilisers to the land, and people need better loans.

Though almost every farmer would agree that the application of chemicals is needed for positive agricultural yields, the feeling that the earth has lost its strength is not generalised, but rather depends on the economic position of the household. For

soil erosion in meadows and to diversify their production and improve their household

instance, another dairy farmer who is in a better situation, and moreover believes that the current way dairy farming is carried out represents 'a future' for the wellbeing of the household, told me, as he ploughed the land with his tractor in order to cultivate a new meadow, that

Can you smell it? These vapours emanating from the earth give strength to all those of us who might feel them.

I would suggest that to perceive the earth's strength, as well as the erosion or degradation of soils, is not just a sensorial matter, but involves a wider evaluation of the self in the current historical context of action. Probably, most people who work the land might *smell* the earth's odours, but to *feel* its strength requires another kind of attention. The earth's strength is not a physical feature, but rather an emotional relation between a producer and his environment that cannot be divorced from the awareness of the social and economic position of the household. I agree in principle with Green (ca. 1994), who points out that,

Perceptions of concepts such as 'erosion' or 'degradation' are not self-evident, but are informed by an interweaving of a community's interaction with the environment, which is itself a multiple-layered and historically rich process. (Green ca. 1994: 307).

However, my ethnography shows that it is not only the history of a community, but also the particular histories of individual households, that contribute to an understanding of the presence of different perceptions of the environment. In the case of Villa del Rosario, the term 'community' might hide the significant differences that have evolved in the last decades between households.

I would like to end this section with a brief reference to another salient presence on the fields as perceived by local people, namely trees. Whilst the human traces left by working the soil are constantly changing, trees represent a lasting sign of culturalised nature and human temporality anchored in the landscape¹⁰². It must be remembered that the landscape is characterised by rolling prairies cross cut by rivulets and narrower seasonal ravines. In this rather flat landscape, trees rise from the ground in isolation or in groups. They provide shade and shelter to cattle. Besides their function in cattle raising, trees are significant as landmarks for spatial orientation. This meaning is realised every time you receive or give directions about how to reach a particular place, both on and off the farm. Moreover, trees in the landscape also represent 'time-marks' in two related senses. Firstly, people might remember who planted them and when, thus trees, like the birthday of household members, act as anchors to the passing of time. Secondly, trees are more often than not associated with the previous settlement of families who migrated from the area, leaving behind them the ruins of their former houses, the so-called *taperas* (Plate 14). Therefore, trees, in a sense, embed social memory in the landscape.

The fields and the development of perceptual skills

The fields as place represent a constantly changing landscape for those who are actively engaged with them. Also this landscape might be said to influence the development of

¹⁰² The human trace represented by trees in the Uruguayan landscape was nicely expressed by the local writer Morosoli in his famous story '*El viaje hacia el mar*'. A countryman invites an acquaintance who has never seen the sea to visit the sea shore. This is one of their dialogues:

'- So, Rataplán. What do you think? Is the sea large or not?

- Yes, it is... it is. But, there is no boat on it... And I believe that a sea without boats is like a field without trees....Do you understand what I mean?... You draw a field and if you don't put in either a farmhouse or a tree, it doesn't mean anything...' (Morosoli, quoted in Wettstein 1967: 73).

vision as the privileged sensorial system to apprehend its ecological values, though other senses like hearing, touch and smell should not be underestimated in the way affordances unfold. Visual skills have evolved, in principle, as the most efficient way of perceiving changes in this rather open environment. As an extensionist put it,

Sight is fundamental, because everything is irregular and constantly changing. For example, I cannot wear sunglasses, because they change my perception of colours and certainly the maturation of plants does manifest itself in their colours. You know the seasons according to the colours in the fields¹⁰³.

Having said that, I would suggest that the development of a relatively biased visual engagement with the environment is an 'adult' perspective, rather than a universal way of perceiving the fields. Perception does not mechanically reflect the characteristics of the salient environmental components, but rather is strongly influenced by the purpose of the perceptual act, which, in turn, is the result of a process of education of people's attention. Whilst walking or riding on horseback through the fields, for instance when driving cattle, people look out for salient forms in a rather open landscape. Wire fences, gates, grazing animals, springs, trees, farmsteads and people are the objects perceived in the distance, whilst low vegetation is continuously inspected and evaluated in the more immediate surroundings. Adults' attention is focused, mainly, on crops, pastures and cattle, as well as on the presence of weeds and toxic plants for animals (e.g. *mío-mío* [*Baccharis coridifolia*]). On the other hand, young boys seem to be more aware than adult farmers of the presence of bushes and medium sized vegetation in their continuous search for traces of hidden small 'wild' animals. Such as hares and partridges. Indeed, children learn practically about the behaviour of small animals while moving through the fields on foot or on horseback. They are 'insatiable' hunters.

¹⁰³ The predominant colour palette of the visualised landscape towards the horizon goes from a dark green in wintertime to yellowish over summertime, though it might change according to current weather conditions.

Children of school age (between 4 and 11 years old) are not commonly allowed to carry guns, so they develop more proximal hunting strategies. For instance, at that age, partridges are hunted with traps installed in their tracks¹⁰⁴. Later on, youngsters start using shotguns and move on to shooting from a distance, the common hunting technique among male adults. When visiting families with children, I always spent a considerable time listening to them as they explained how to hunt a hare or a quail, and described every aspect of the life of otters and ants, and so forth. I am aware that my presence could have motivated their interest in showing me such environmental objects and events; adults, however, did not find it so important to refer to such things in our conversations. I would call the children's attitude an 'exploratory perception of the environment'. It is based on free movement through paddocks and a multisensorial appropriation of objects. On the other hand, adults are more aware of plantations and cattle conditions. They seem to notice in the fields those objects and events that are related to activities in the sphere of the household economy. I would call this a 'productive perception of the environment', which might be said to stand closer to a kind of 'practical reason' (Sahlins 1976). In other words, the value of perceived objects is mainly constituted by economic utilitarian goals. Productive perception does not need a continuous closer look at objects because the expert adult farmer can notice if something is not right from a more detached stance. He/she does it by moving through more fixed paths and, if doubts arise, going for a closer inspection of an object. Therefore, a shift between productive and exploratory attention is possible and necessary. A clear example is that of rural extensionists and farmers who work together

¹⁰⁴ Traps are made of an inverted U-shaped piece of metal which is dug into the soil. An invisible fine string with a lasso in one of its ends hangs from the frame. Maize grains are normally used as bait and put in a line that passes under the frame. A partridge would pick the grains without noticing the lasso, in which its neck is caught at once. Hares may be hunted in a similar way, but using larger traps.

in the evaluation of a particular plantation by touching crops. However, I believe the attention of the expert farmer in a daily routine is a 'panoramic' one (Schivelsbuch 1986), and sight becomes the dominant sensorial system. As most adult farmers said: *He who doesn't see, doesn't know*¹⁰⁵.

Fields are socially complex

As I said before, one of the most important changes in the cultural value of fields has emerged from their function as a practical storage place for forage for animal feeding. Compared with crop farming, modern dairying is a more mediated process of production. The shift to dairy farming amounts to an almost totally new form of land-use and management centred on maintaining the wellbeing of dairy cows in order to obtain their milk¹⁰⁶. Yet, this process involves not only a direct relation between a farmer and his objects of labour, but coping with social forces as well. The following examples highlight three such variables: the mediation of the Co-op in relation to what would be sown, the mediation of the domestic organisation of labour in the choice between technical alternatives, and the mediation of fellow farmers and rural extensionists in the planning of production.

Case 1. A couple of years before my fieldwork, Bermejo (46), a dairy farmer with a technical educational degree, went to buy seeds at the Co-op's shop. Although he planned to get a particular proportion of red clover and lotus seeds for a new meadow, the required quantity of the former type of seeds was not available at that moment He

¹⁰⁵ In Spanish: '*Quién no ve, no sabe*'. The dominance of visual perception might also underline the traditional proverb: *El ojo del amo engorda el ganado* [The master's eye fattens the cattle], which implies the association of seeing with control not only over animals but also over people.

remembers feeling 'obliged' by the circumstances to seed '70% lotus and 30% clover'. Then, he observed that the effect was beneficial in decreasing the risk of *meteorismo* because, he explained, 'the cows just "pinch" the clover whilst eating the taller lotus'. From then on, he has repeated this combination of seeds on new meadows. He spread the news among his fellow dairy farmers and said some farmers did follow his example.

Case 2. Julio, an adult dairy farmer, had grown 3 hectares of maize at the end of 1997. He told his fellows in a dairy working team meeting of his intention to produce trench silage with it when it was reaped. Farmers and technicians debated at length about the kind of silage that would be most convenient for him, according to his herd size and feeding needs, as well as the household's financial resources. A couple of months later, I saw the heaps of corn standing in his fields, which meant that the idea of the silage had not been realised. He explained to me that to make silage would have meant applying for a new loan and he was currently too indebted to do so. Consequently, he decided to harvest the maize by hand and use it as dry fodder to feed his herd. According to his expectations, he added, the dairy herd would not require more fodder than that which might be provided by using dry maize. Moreover, at the time of the harvest, his son was back on the farm, after failing to be included in a professional football team in Montevideo. Therefore, there were enough 'arms' for manual harvest, which in turn, helped in taking the final decision. Although he was happy with the end result, he stated that next year he would go for a mechanical harvest and silage production, because he was really fed up with the manual job.

Case 3. On a cold winter's night, a dairy working-team met at Rosa's home. An agronomist, four men, the hostess and her younger son, and myself were discussing not only Rosa's case, but also more general topics on dairying. We were sitting at the table in the warm kitchen, while eating pizza, a sweet cake and two *mates*¹⁰⁷ were passing around. After the agronomist's detailed report on the current situation of Rosa's *tambo*,

¹⁰⁶ I am aware that, on many farms, crops for human consumption are still grown (e.g. potatoes). Moreover, growing meadows to obtain clean seeds [*semilla fina*] for the market has also been an increasing option. However, they represent a minor part of the total fields, which are nevertheless worked in the kind of rotation described in this section, for cattle raising.

the conversation turned to the planning of forage and, particularly, to the growth of summer crops. An extract from my fieldnotes follows,

14/8/98

Agronomist: I shall repeat this. You should begin to think right now about silage, maize and grains; because, we are approaching the time to apply for a loan. (...)

Dairy farmer 1: I am thinking of making silage of maize, because I am tired of manual work.

Dairy farmer 2: If you make an early silage, you could make a second one immediately after it.

Agronomist: I don't recommend it. It is better to seed early oats. (...) It is important to reduce the risk of missing the best period [end of spring] to do things, and a second maize silage is expensive and a very sensible option.

Dairy farmer 3: What about the kind of seeds and fertilisers available at the Coop's shop [*PROLESA*]?

Agronomist: You might have access to seeds for maize, sorghum for grain, and Sudan-grass. They are very cheap. Those seeds are produced by 'Pioneer' [a multinational company].

[Discussion on how the Dairy Co-op has chosen the available seeds and other inputs¹⁰⁸]

Dairy farmer 3: What shall we do? Shall we talk about our needs, right now?

Agronomist: If you have any doubt about what to plant—maize or sorghum—just ring me. Nowadays, everyone has to look out for himself and act accordingly. It isn't worth applying collectively for a larger amount of seeds anymore [as in the past]. This is because we must look at the actual balance of each person's bank account; who is overdrawn and who's not. Nevertheless, I suggest we should go for maize silage, and together we ought to buy a chopping machine.

The above cases exemplify the ways in which the appropriation of the fields' resources is socially mediated. Moreover, they show that farmers do not have a fixed 'indigenous knowledge' of the environment, but that knowledge is constituted through a continuous exchange between different points of view and practices in changing social conditions.

¹⁰⁷ Paraguayan tea.

¹⁰⁸ The Co-op organises an annual competition of seeds and buys from the winner to resell them to members. The agronomist, who attended the final session of the last competition, stated that he did not understand the decision of the Co-op judges because, according to his opinion, the technical results achieved by the winning company's seeds were not the best. Therefore, he placed a question mark on the potential efficiency of future seeding, as well as raising doubts about the objectivity of the managerial decision. More interestingly, one of the managers of the winning multinational company in Uruguay runs a dairy farm in Villa del Rosario, and he is well-known among local people as having been involved in shady business during the time of the sugar beet industry, when he used to give technical advice to crop farmers. This fact was considered by a couple of farmers to provide an analogy between what happened with their livelihoods after the collapse of the sugar industry and the possible future of dairy farming.

Richards's (1993: 63) concept of 'improvisational capacities in the technological arena'

seems applicable to understand the way farmers work their fields. In his words,

[M]uch of the material that gets woven by the anthropologist (or the observer) into a satisfyingly complete, free-standing 'indigenous agricultural knowledge system' is often nothing of the sort, but rather the product of a set of improvisational capacities called forth by the needs of the moment. (Richards 1993: 62)

These improvisational capacities are not only imbued with technical knowledge, but also involve a complex handling of relations within the family, with the Dairy-Co-operative, with technicians, the State, and so forth. People's appropriation of fields through their work cannot be understood in isolation from the relations between people. Let me consider the third case a little further. I believe that the sharing of experiences between farmers and technicians through formal and informal meetings has not only changed the way dairy farmers work their lands, but has also led to more reflective thought. The latter by no means leads to final, close-up and systemic knowledge. Yet it does provide a context for the emergence of a more abstract and detached notion of farms in general and of fields in particular.

The relation between technicians and dairy farmers might be seen as an evolving 'zone of proximal development' (Vygotsky 1978). Vygotsky defined it as,

[T]he distance between the actual developmental level [of children] as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. (1978: 86)

He went on to propose that,

learning awakens a variety of internal developmental processes that are able to operate only when the child is interacting with people in his environment and in cooperation with his peers. Once these processes are internalized, they become part of the child's independent developmental achievement (ibid.: 90)

I would not put the farmers in the role of 'children', neglecting the fact that their attitudes within the environment when becoming dairy farmers were already informed by the accumulation of past experience. Furthermore, technicians were not just independent 'teachers', who came to the area to guide people on problem solving. On the contrary, they have been part and parcel of a more complex institutional framework with its own objectives guided by new industrial needs. Technicians had to deal with these needs in mediating between the Dairy Co-operative and the new members. My point, however, is that in the case of dairy farmers changing the social environment of their practical engagement with natural resources likewise led to the emergence of a new zone of proximal development. When technicians and farmers plan the sequence of rotations in the fields, draw diagrams of the farm, calculate the amount of chemical fertiliser required, present productive projects in written form when applying for a loan, and so forth, the results are not just ephemeral activities. People learned new ways of doing things when the theoretical model started to be grounded in each particular situation. Technicians have provided the tools for present and future 'problem solving' that dairy farmers took, compared and used according to their own understanding. One of these tools was a more integral view of the physical components of the fields domain, which, I suggest, farmers have retained and developed as their own. The use of this cognitive tool has been a more abstract way of knowing the farm and fields. This new spation of farms was expressed in people's drawings.

As part of my interviews, I asked my informants if they would draw the farm for me. In almost all cases, people began by drawing the contour of the farm, which represented the so-called 'legal fence' [*alambrado legal*] that acts as the material boundary of the

real estate. (See farmers' designs in appendix D). People did so, not only for the main plot, but also for other more distant plots they might own or work as tenants. After this initial line, there follows the internal subdivision by paddocks and, often, the presence of buildings or other salient environmental components like trees, rivulets or water reservoirs. This kind of representation of a farm shows an 'aerial perspective', which might be interpreted as the historical development of farms as space, i.e. a location where people's movement could be neglected in favour of a more static structuration of external entities. Furthermore, nobody attempted to sketch animals in place, which I think reinforces the idea of lack of movement. Significantly, when more than one person was present at the time of the interview, people selected the one who might outline the farm in a nicer way. In this regard, I did not find any gender or age bias as regards the person whom the family selected as the best draftsman. Moreover, nobody refused to carry on with the drawing when alone at the time of the 'exercise'. I believe this fact speaks of a generalised representational skill, which strongly contrasts with the differential pattern of movement and action in the various domains of the farm. On the other hand, this latter difference between practice and representation became evident when I asked people to indicate the current crop or kind of meadow they were cultivating in each paddock. At this point, most adult women recognised their total or partial ignorance and advised me that I should ask the men of the household to collect accurate information about that. Although I have not explored in depth the process whereby farmers acquire the aforementioned representational skills, I would add to the interaction between farmers and technicians, which I have already described, two other instances when this practice has become necessary for local people. Probably, it is at school that local children first face the task of developing this aerial perspective, when they have to learn how to interpret a geographical map, something that, according to

one school teacher, is not easy achieved. Also, a similar exercise to that which I proposed to my informants is commonly set as homework for schoolchildren, conducted in co-operation with their parents. A second instance where aerial mapping of farms is of importance relates to the legal procedures of land entitlement, inheritance and/or transaction. As an integral part of the documentation that farmers keep and actuaries consult, there is always a drawing of the farm, in addition to a written description of its current assets.

To sum up, dairy farmers cope with many complex biological and social relations in their fields. People feel they must improve and give a strong hand to 'nature' in order to yield more positive productive results. They also feel it is important to learn new techniques, try new seeds, take care of cattle feeding, listen to technicians, and so forth. In short, they are open to experiment in their fields, though on their own terms which are mainly guided by caution about contracting debts. The farm's fields have become a more coherent space where human labour has an increasing role in influencing yields and the reproduction of soil conditions. Moreover, the use of modern techniques and management strategies has significantly helped people to control the process of soil erosion and depletion, though the growing use of chemical fertiliser is sometimes felt as a counterforce. In short, most farmers would look at their farm as a place to exercise ingenuity. Furthermore, I would suggest that the relatively good yields achieved have reinforced their sense of domination over nature.

Dairy Farms

Scarce space

The above discussion prompts me to explore a common assertion among family dairy farms, namely that their land is meagre. The 'objective' size of the majority of family dairy farms in Villa del Rosario is less than 150 hectares (see table 9 below). According to national and regional socio-economic evaluations of dairy farms (Ferrari and Lazaro 1990; Giarraca 1996), almost all surveyed family farms would be regarded as smallholdings in relation to the available technology. Consequently, dairy farmers constantly need to expand the carrying capacity of their lands for cattle raising. On the one hand, they have intensified the use of land to increase its productivity per hectare by speeding up crop rotation¹⁰⁹. On the other, they try to enlarge their plots considerably. In this respect, the familiar strategies are various. Firstly, they would buy new plots if low-interest credits were available (preferably through the Dairy Co-op). Otherwise, farmers would seek to rent land not far from their main plot. The presence of official lands in the area (see chapter 2) has allowed a couple of dairy farmers to obtain new lands paying lower rent and on better contractual conditions. Secondly, dairy farmers engage in sharecropping arrangements, mainly with other producers not oriented to dairy farming. For instance, a dairy farmer might grow feed crops to create reserves in a neighbour's paddock, and after harvesting will seed a meadow for the landowner. Thirdly, the organisation and management of collective rearing fields [*campo de recría*] has been one of the most publicised innovations among dairy farmers and has been brought about by the work of *Conaprole's* rural extension experts. In these rearing fields, farmers feed non-lactating cows (e.g. young heifers and dried-off cows), whilst reserving their main plot for the current lactating herd. During my fieldwork, a group of

¹⁰⁹ Many agronomists, based on controlled research, believe that it is possible to raise one milk cow per hectare of land. However, this potential ratio of cow/unit of land does not necessarily reflect the real conditions of forage production in a particular farm. Soil diversity, weather conditions, accessibility to assets and labour time, among other factors, are not included in the

dairy farmers in Villa del Rosario were applying for a nearby plot owned by the National Air Force, and another working team succeeded in getting access to a plot owned by the INC¹¹⁰. On the other hand, individuals might use their kinship or neighbour networks to find a rearing field. In short, dairy farmers cope with the limitation of workable land by strategies of both intensification and geographical expansion.

Size (in hectares)	Number of family farms	Number of non-family farms	Total farms
< 50	7	1	8
50-150	9	3	12
>150	1	3	4
Total	17	7	24

Table 9. Size of dairy farms in Villa del Rosario, according to type of farm.

Source: Fieldwork.

I would suggest that the concept of 'scarcity of land' has developed in relation to people's current agricultural practices. Furthermore, modern dairy farming has reinforced this sense of lack of space. In the national literature, 20th century Uruguay stands out in the Latin American context due to the absence of any kind of 'land hunger' like that observed among poor rural producers in other countries (Quijano 1984: 19). Indeed, the historical attempts at land reform aiming to redistribute land among smallholders were promoted by the political and intellectual elite, rather than being the result of grassroots movements. This happened even during the 1960s, when

eco-economic formula. Nevertheless, the experience of some dairy farmers has confirmed this ratio and it has become a guiding principle in planning the future of their farms.

the idea that agricultural land ought to be possessed by those who actually work it became a central proposition of the social forces opposing the power of the traditionally rich landlords. On the other hand, current small and medium scale dairy farmers claim that the government should take measures (mainly to facilitate people's access to cheap loans) that would allow them to improve the viability of their rural enterprises¹¹¹. Thus, the cultural value of farms cannot be understood separately from the current economic and technical changes, against a historical background of land concentration in a few hands. This state of affairs is not manifested in strong conflicts over land. The expansion of private landlords is not politically contested, but rather is taken for granted. Smallholders and larger holders of land develop a relationship of symbiosis. The former might provide their labour while the latter contribute with job opportunities or even by lending their own 'space' (e.g. a barn to dry seeds or a forest to keep horses). There are no explicit politics of place.

Accessible places

At the end of the 1960s, an anthropologist stated that Canarios crop farmers were self-marginalised people, who rarely communicate with other social agents beyond their neighbourhood. In his words,

¹¹⁰ Significantly, their collective application succeeded against some other individual applications for the same piece of land. However, later on, it became clear that not all farmers who signed the petition were raising their cows in the fields. Indeed, half of the petitioners could not afford the payment of their part of the rent and production costs and consequently had not got access to the asset. We have to understand that the collective action of dairy farmers' working teams is based, generally, on individual responsibility over equally divided debts. Therefore, a group's functioning depends on the previous social differentiation between its members. Moreover, it seems that grouping does not constrain the differentiation of initially 'equal' farms.

[*Canarios*] are distrustful people, captious, and reject all what they ignore. They are poisoned by their piece of ground, which leads them to isolation within their plots to the extreme that they only travel to town during the [religious] festivities of *San Isidro Labrador* [15th of May] and the *Día de los Difuntos* [Old Saints' Day]. (Vidart 1969: 41)

Apart from my doubts about this kind of generalisation, I can hardly contest this judgement with more objective data from that time, although, according to my collected testimonies, social life was always very intense and by no means limited to the family domain. However, even assuming a certain truth in Vidart's observations, the current situation shows just the opposite. People are mobile, and religious motives for travelling have become rather weak. Moreover, people actually reject both geographical and cultural isolation along with the experienced changes in communication infrastructure. Certainly, farms have become nodes of multiple networks in a traffic of people, commodities and information.

One of the main changes experienced recently by dairy farmers and other rural dwellers has been the improvement of terrestrial access to farms, which, in turn, is closely related to the development of modern dairying. Although the development of better roads has long been a concern among rural dwellers, it was during the first years of farmers' reconversion to modern dairying that the lack of well-maintained farm entrances was strongly felt among dairy farmers. At that time, dairy farmers had to take their milk churns in horse-drawn carts or on foot to the main road to be collected by the Co-op's lorry. The distances varied from 20 metres to 12 kilometres and consequently the time allocated for this particular task was in many cases a significant constraint on the normal functioning of the farm. It was a hard job, especially during rainy periods

¹¹¹ Between 1980 and 1990, 660 dairy farms disappeared, most of them smaller than 50 hectares (Dirección de Censos y Encuestas 1994). Moreover, between 1993 and 1997, another 10% went

when farm entrances and secondary roads became muddy. Since the early 1990s, the provincial authorities channelled an international loan from the Inter-American Development Bank (IDB) to build macadamised entrances and improve road conditions. Indeed, this change became a basic requirement when, in 1995, *Conaprole* took the decision to collect only bulk milk from the associated farms, using isothermal milk lorries. Thus, the presence of these well maintained roads and farm entrances crystallise the link between agriculture and agroindustry. Certainly, people felt satisfied with this change. Its significance reaches the point where, according to a general opinion among farmers, a former provincial mayor was re-elected to his position in 1994, mostly because of his administration's concern about the improvement of the road infrastructure. On the other hand, many informants judged that this improvement happened too late for the survival of the rural community. As one of them put it,

Now we can take our products out of the farm easier than ever. However, there are not many people to do the job, not to mention the lack of goods to be transported.

Yet, the meaning of the farm as an accessible place is not restricted to the plausibility of the coming in and out of persons and goods throughout the year, no matter what the weather conditions, but rather to the continuous flow of information through the household. During the 1950s, rural people experienced the innovations of radio culture. Older people's memories coincide with Hobsbawm's (1994) reflections when he pointed out that,

[The] radio transformed the life of the poor, and especially of housebound poor women, as nothing else had ever done. It brought the world into their room. Henceforth the loneliest need never again be entirely alone. And the entire range of what could be said, sung, played or otherwise expressed in sound, was now at their disposal. (Hobsbawm 1994: 195)

bankrupt. All of them were smaller than 200 hectares, whilst on the other hand, the number of

In 1958, a local sociologist foresaw the increasing influence of urban styles in the rural areas and stressed the importance of the radio in this process. In his words,

We are witnessing a kind of 'urbanisation' of rural culture. Above all, the radiotelephony affords a permanent source of updated information about the rest of the world, among a great number of rural dwellers. It helps to break down their psychological isolation and increases the significance of indirect experience. Moreover, it turns people into full participants in forms of entertainment which, until recently, were exclusively urban. (Solari 1958: 163)

Indeed, the historical significance of the radio in rural households is intimately related to its function as a medium for political propaganda. In the late 1950s, a 'ruralist' leader known as *Chicotazo* helped to put his party in power through his radio messages aimed, mainly, at rural producers, changing the previous rules for electoral campaigns (Castro 1961: 74; see Hobsbawm 1994: 196 for similar examples in the Western world).

Since that time, the 'voice of the radio' has been part of the daily 'soundscape' (Murray Schafer 1989) on the farm and, besides its informative and entertainment functions, it has also promoted interpersonal communication at local level. For instance, in the early morning, in almost every household, the radio is tuned on to listen to the local station that broadcasts news about one's fellows' lives (mainly deaths and illness), information on cattle and agriculture markets, and social events in the rural and urban areas over the week. Furthermore, a traditional system of communication between people through the local radio station is still in place, the so-called *telegramas radiales* [radio telegrams]. People phone the radio station and leave a message for particular receivers. Although the text is better understood by those directly involved, on many occasions any listener might grasp the meaning of the message due to their common experiences and personal

large dairy farms (more than 500 hectares) increased (*El País Agropecuario* 1998: 33).

knowledge. Therefore the radio telegram is a relatively public document and a topic of family conversations.

However, as more people get their own telephones, the usefulness of this communal service is reduced, and it might be suggested people's way of being in touch are shifting towards greater intimacy. The recent installation of telephones on the farms is another important step in the constitution of the farm as an interrelated place. It has meant a new affordance for the household estate: the possibility of instant communication to other persons in the neighbourhood and more distant places. Only one year before I conducted my fieldwork, people had to travel to the Phone Centre in the village to make and receive phone calls. Due to its inconvenience in terms of time and distance and its particular opening hours, people made use of this service only when they absolutely needed to. Dairy farmers were the first in the area to try an alternative solution to avoid travel-time and isolation. At the beginning of the 1990s, a group of them installed a radio transmitter to improve communication between themselves and with the local farmers' association based in the provincial capital. Later on, wealthier farmers and technicians introduced the use of mobile phones. Finally, since 1997, the state communication company (ANTEL) has developed a project to expand telecommunications into rural areas, introducing a fixed cordless telephone, the so-called *rurancel*. The consequence has been that an increasing number of dairy farmers ring up their neighbours, rural extensionists, veterinarians and shopkeepers, and that this replaces face-to-face interactions. Farmers do not have to move from their houses to arrange appointments or communicate with other people, but can stay where they are. As an extensionist pointed out,

Nowadays, if a dairy farmer wants to survive, he needs to know not only how to work his land, but also how to speak on the phone and to whom.

On the other hand, and as a countertrend to individualisation, a house with a telephone receives frequent and, sometimes, regular visits from neighbours without telephones, who ask to make or receive a call. Therefore, the house has become a place for new personal interactions mediated by the presence of the *rurancel*, which, in passing, sometimes leads to silent animosity among owners about the financial cost of this provided 'service'¹¹².

Finally, I shall mention the relation between people and television. It is no surprise that the opinion of local people on the changes brought about by this mass medium was always analogous to the radio 'revolution'. In most cases, the TV set occupies a central location in the house, being installed in the kitchen or the dinning room. People do turn it on at different times during the day, though mostly between early evening and bedtime¹¹³ (more on the relations between TV and daily schedules in chapter 5). Most families I visited have a colour television set, though black and white ones are still in use. In many cases, a colour TV set 'invites' relatives and friends to visit their hosts to watch a particular TV programme (e.g. soap operas) that has not the same appeal if watched in black and white. People normally watch TV while carrying on with their conversations or other tasks in the house, and it is rather a familiar habit. Most people would agree that to be able to watch TV at home is a positive thing, though many regret

¹¹² Interestingly, although everyone agrees that the introduction of the *rurancel* has been beneficial, some local people are nowadays claiming that it is not fair that they cannot connect to the Internet through them. This has pushed the government to find a solution to this 'citizenship inequity'.

¹¹³ TV programmes are transmitted from around 6am till after midnight. In Villa del Rosario, people can tune in to the four open-channels of the capital Montevideo, plus another one whose station is located in a neighbouring province. On wealthy ranches satellite TV can be found.

the displacement of other activities, mainly reading¹¹⁴. In this respect, I must say that I was always puzzled about the lack of books in most residences, taking into account the high degree of formal literacy among dairy farmers. Having said this, textbooks are in place if any child is actually attending school. Moreover, in almost every dairy farm associated with *Conaprole* it is possible to find a couple of technical magazines, especially a bi-monthly one ('*El Tambo*') edited by one of the Co-op members' association (i.e. ANPL). Its contents revolve around union activities, dairying and agricultural debates at national and international levels, scientific and technological advances, and plenty of trade advertisements.

The recent development of rural communications facilities has meant that most activities people conduct on the farm are directly mediated by the functioning and policies of the State, as well as private companies' strategies in the market (e.g. service costs, technical maintenance, and so forth). The farm has become not only a materially connected place, but rather it is institutionally interwoven at a more abstract level.

The meaning of place beyond the farm: neighbourhood, zone and virtual spaces

In the previous sections of this chapter, I showed the changing meanings of the farm among family dairy farmers, as well as the more particular understandings of nested places in a typical dairy farm. The methodological standpoint was to keep the person at the centre of the perceived world, though I also proposed that peoples' representations

¹¹⁴ An older informant expressed his perceptions of the change brought about by TV in the following terms: 'Nowadays we know more things. Indeed, we have more topics of conversation whilst in the past people had to invent stories because not many things happened worth talking about'.

and practices might lead to the constitution of farms as a human decentred space. In this part of the chapter, I shall follow the same methodological premise. Namely, I shall look at the interface between place and space outside the limits of the individual farm by putting people's activities at the centre of my analysis, following their movements through the landscape, and consequently the establishment of networks in the physical and social domains of the environment. I argue that there exist three 'emplacements' beyond the spatial reality of a dairy farm: the immediate neighbourhood, the zone, and the virtual space of the nation-state, regional market and the global planet. People's experiences of these domains show an increasing estrangement from other people and other components of the environment, whilst moving conceptually from the neighbourhood to the region, though this is related not to geographical distance, but rather to social distance.

The neighbourhood

Imagine that you are a male adult farmer and want to till a piece of land, but you need a heavier plough. Where might you borrow one? Imagine that your mare fell down into the cesspool when your grandchildren were riding it. Who could you call to help you to rescue such a heavy animal? Imagine that you are a recently arrived rural entrepreneur and need somebody to fix a wire fence. Who will you ask to do this job? Imagine you want to share the costs of travelling to the cattle market. Where would you find a partner? Finally, imagine you would like to drink some milk, but you have not got a milch cow. Who will you ask for some? All these situations and their resolution are daily occurrences through which the sense of a neighbourhood is constituted. In local Spanish, the English term neighbourhood is translated as *barrio* or *vecindario*.

According to Solari (1958), the constitution of a *vecindario* was characteristic of social life among small-scale arable farmers during the first half of the 20th century and, moreover, its origins were rooted in 'peoples' need for mutual aid and extra-family linkages' (Solari 1958: 364). Nowadays, the meaning of the neighbourhood remains tied to its function as the perceived place where an individual family or rural producer might reliably find support to sort out an unpredictable daily problem. Needless to say, the boundaries of the neighbourhood are not fixed but changing.

Two kinds of interrelated 'distances' between people are involved in the definition of the neighbourhood: geographical and social. Geographical proximity between farmsteads was an important factor in the development of neighbourhood relations, especially when the transport infrastructure was underdeveloped. The possibility of reaching a farmstead on foot, horseback, bicycle, motorcycle or a tractor, by a journey that would not interrupt the continuity of the daily schedule, is still an important element in the definition of who might be considered a 'neighbour'. Indeed, those families and persons who dwell physically closer to a farm are the prime subjects to be approached in case of necessity. However, the geographical distance between neighbours has changed dramatically in the last two decades, for two main reasons. Firstly, the accelerated out-migration of rural dwellers has meant that there are fewer approachable persons in one's immediate surroundings. Secondly, travelling to other farmsteads is easier and less time consuming, due to the use of faster means of transport and better roads. There is indeed a time-space compression, even though the 'objective' measure of the distance of the journey would be longer than in the past when people used to cross the fields to visit a neighbouring farm, instead of following a fixed network of roads and secondary tracks.

Having pointed out the importance of geographical distance in the definition of the neighbourhood, I shall stress that the physical distance is increasingly subsumed under the social distance between people. Social distance and proximity might be defined in terms of degrees of interpersonal trust, friendship or assumed compromise. Probably, the steady elimination of environmental obstacles to travelling and working, and the fact that people are no longer so subject to strong forces in the physical environment (e.g. flooded rivers), reinforce a certain autonomy in the social domain. In terms of the kind of sociality involved in the interweaving of the neighbourhood it seems that the founding of neighbourhood networks on the basis of kinship relations was more prominent in the past than nowadays. Nevertheless, kinship-based relations might still be important in those areas where cognates and in-laws continue to dwell nearby. Sometimes, farmers explicitly avoid assimilating neighbourly relations to the 'given' condition of kin, because they feel that interpersonal relations based on kinship involve a more permanent reciprocal attitude, whereas the positive thing about neighbourhood is that the relation has to be rebuilt time and again. Consequently, personal reliability might be put under permanent scrutiny, and the person seems to be freer to choose to develop, break or 'keep cool' a former relationship. The flexible nature of neighbourhood relations, centred on the efforts of an individual family farm to increase its sources of help of various kinds (labour, machinery, information, counselling, etc.), has allowed the relatively easy inclusion of newly arrived entrepreneurs as local partners. Significantly, these new rural producers are, in most cases, wealthier than the established family-farmers, or in the latter's words: *'The money comes from another source, not from agriculture'*. These wealthier people represent, in the eyes of most local people, potential sources of permanent or temporary jobs, especially for young

boys. Also, they might become sharecroppers. Finally, these newcomers have in many cases brought with them new agricultural techniques, machinery or 'different ways of resolving common problems', which are, in general, welcomed by cautious but open-minded neighbours. It must be mentioned that local people do discriminate between those rural incomers who want to work the land and town people who have just invested their money in land and normally visit the plot with family and friends during weekends. Local farmers are more willing to engage in neighbourhood relations with the former than the latter, because they feel the money investor might 'fly away' at any time, whilst those who till the land might last longer. Interestingly, it was through people's conversations about the relatively recent arrival of new producers and 'visitors' in the different neighbourhoods, that the perception of the 'monofunctionality' of the countryside emerged in their discourses. In other words, confronted with other ways of engagement with the environment, local people stress that the countryside affords the production of wealth from the natural resources (soils, animals, and plants) while other uses of the countryside are regarded as at least suspicious, if not completely useless.

Finally, it is possible to observe among family dairy farmers a certain link between previous neighbourhood relations and the spatial location of current modern dairying. For one thing, dairy farms are not far from each other (see figure 9). I suggest two main reasons for this geographical proximity between dairy farms. Firstly, farmers must cover the costs of milk transportation from farms to the Dairy plant. Therefore, when the agreement in the late 1980s was reached with *Conaprole* to collect farmers' produce, the intended reduction of transport costs required as many farmers as possible to be in a circumscribed area. Hence, influential farmers who had decided to reconvert their farms

succeeded in convincing the neighbours in their immediate surroundings to follow their example. The action of the Co-op extensionists had the same objective, and should not be underestimated¹¹⁵. Secondly, and very much related with the previous point, it is the habit among farmers to evaluate and imitate neighbours' technological and economic strategies. People might 'copy' practices and productive strategies, in so far as they believe it is successful in economic and social terms (CLAEH/CINAM 1963: III.4). In chapter 2, I showed that over the first stage of the productive reconversion process, dairy farming became one of the most attractive alternatives for family farms. It is not surprising, then, that once a family has started to develop a dairy farm, many others have followed it¹¹⁶. Furthermore, it is important to emphasise that Co-op members do not directly compete among themselves as commodity producers, a fact which might in turn enhance co-operation. The fundamental institutional principle of the Co-op, to receive the total amount of milk produced by its members under particular conditions of hygiene provides a context for the development of an ideology of mutual symbiosis rather than conflict. This is not to say that relations between neighbouring dairy farmers are without strain. Yet, conflicts are not directly related to market dynamics, as happens

¹¹⁵ Extensionists' attempts, with relative success, at the formation of machine-sharing groups among dairy farmers, required two main assumptions. The first was a short geographical distance between partners to allow an efficient use of the collectively owned agricultural equipment, especially during peak periods when all of them were engaged in similar tasks (e.g. baling hay). And the second was a certain feeling of trust between partners, which was supposed to be an intrinsic feature of neighbourhood. The practice of those groups has shown that both assumptions were wrong.

¹¹⁶ I partially disagree with Richards when he states that '[i]n any agricultural application it should be, in the first instance, "learning by doing" (as distinct from the "participant observation" practised by anthropologists which is often mainly "learning by talking")' (1985: 157). Drawing upon my ethnographic data I would suggest that there is not a two-step process of 'doing' and then 'talking'. In becoming dairy farmers people were engaged simultaneously in both practical and representational learning from fellow farmers and rural extensionists. This is not to deny the fact that farmers rely heavily, like everybody else, on the past experiences of doing things. Moreover, they do not 'listen' to everyone as bringing the truth of the matter, but mainly to those 'experts'—being farmers, technicians or media presenters—with whom they have built a relationship based on trust.

between direct producers who might compete with the same product in the same market sector (e.g. pig producers).



Figure 9. The location of dairy farms in Villa del Rosario.

Key: *Conaprole* members (black dots)

Send fresh milk to local cheese dairy (white dot)

Sell milk to middle men (black/white dot)

Year of starting market oriented dairy farming e.g. 97 stands for 1997.

The zone: the local still

Beyond the immediate neighbourhood, people do recognise a wider place, which they call the zone [*la zona*]. In many ways, and from a person-environment perspective, it is a continuation of the neighbourhood in the sense that the limits of the zone may be expanded or reduced along with the development of personal networks and the use of objects in the environment. For instance, people say that access to tools and machines depends on their ‘presence in the zone’, and dialectically, the zone would be defined as

the place where tools, machines, and labour might be found. Farmers would ask, 'Is it materially possible to bring a particular machine to the farm?' If yes, 'Is it likely to turn up when required?' And finally, 'Can the farmer afford to pay for its transport?' This example of machine-zone-person relations shows that a phenomenological definition of a place's boundaries (in this case, 'our zone') is rooted in the practicalities of day-to-day life rather than in abstract geographical features. In reality, the above definition of zone is more common among male farmers than women because the former are directly engaged in the several networks of tool and agricultural service exchange. As I show below, the perception of the zone as place among women is linked, though not exclusively, to other kinds of movements of people, information and objects more related to formerly identified localities [*localidades*].

Having pointed out some continuities between neighbourhood and zone, it should be said that the latter as a recognisable place seems to present less flexible boundaries than the former. This characteristic of the zone derives, in principle, from its origin in formerly well defined localities. Unlike the neighbourhood, localities are actually named, and each name could be said to express 'a chunk of concentrated information' (Sebeok 1988: 68)¹¹⁷. As Frake pointed out:

The limits of a name serve, like a verbal fence, to enclose an individual place as a spatial self. Peoples differ in how they mark off continuous spaces into bounded places. (Frake 1996: 235)

Named localities (e.g., Ortiz Train-Station; Roldán; Villa del Rosario; Barrancas) generally coincide with official administrative divisions aimed, for instance, to organise the population census. However, people's awareness of their locality is strongly related

to the presence and influence of the rural school based there. It might be difficult to assert what came first, the school or the identity of a particular locality, but undoubtedly the school is the main landmark, allowing an outsider to know that this place might have a name and a particular social fabric. It is common to use the number of a rural school to refer to a whole locality (e.g. 'It is there, at the 23' [*Allá, por la 23*]). Indeed, the school is the main focus of social life in rural communities (Plate 15 and 17). Parents of children who are currently attending the school, in many cases the same school they themselves attended when younger, participate in the 'parents' committee' [*Comisión de Fomento*]. This committee helps the school director and teachers in organising communal events like *beneficios* [charity festivals] or meetings to debate any particular problem in the community (e.g., rural electrification projects). According to my survey, among family dairy farmers, participation in the school's parents' committee was almost the only regular experience of participation in any social organisation, especially for women. Furthermore, schools in the area under study lend their buildings for use as the headquarters of at least two rural youth clubs that have experienced a certain revival over the last decade¹¹⁸. But, due mainly to out-migration,

¹¹⁷ To name a place, or an object, does not mean that that place or object was not previously known. Knowing a place is firstly to experience it. To name it is a manifestation of the social recognition of its significance in peoples' lives.

¹¹⁸ These clubs are members of the nation-wide Rural Youth Movement (*Movimiento de la Juventud Agraria*) created in 1948 by a group of professional agronomists aiming to improve the living conditions of the youth in the countryside. Nowadays, it receives financial support from the state and the Inter-American Development Bank. Besides the organisation of sport events between the different youth clubs, the Movement's main objective is to give loans for productive projects conducted by youngsters (defined as younger than 32 years-old).

localities have been losing their meaning as autonomous places and became amalgamated in the wider notion of zone¹¹⁹.

The case of the village of Villa del Rosario itself (officially identified as a *caserío rural* [rural cluster of houses]) shows the changing nature of peoples' identification with, and attachment, to place. In chapter 2, I showed that the historical origins of Villa del Rosario could be traced to the settlement of European crop farmers and the establishment of general stores, warehouses and a small mill. The population of the village in 1963 was estimated to be 130 inhabitants (Brusa 1963: 139). Almost forty years later, the number of people living in the village is about the same, while other localities have experienced a steady decrease in the number of households. It could be said that Villa del Rosario has become the heart of the district, displacing the former train stations as the referential point for local and non-local people¹²⁰. In the mid 1970s, the Villa del Rosario settlement appeared to be subsumed under Ortiz Train-Station¹²¹ in official documents and maps, although the name of the village could be found in travel guides and on road maps as an independent locale, at least since the 1960s. According to an older person's testimony, the name of Villa del Rosario would have become more public in the mid-1930s, when he was in charge of the post office located in his father's general store and decided to add this geographical referent to people's

¹¹⁹ For the last five years, an education reform has taken place in the country, including the relocalisation of rural schools. To reduce costs, in many parts of the country rural schools attended by a diminishing group of pupils were concentrated in only one building. Moreover, in rural areas near a town, children have been transported in official coaches to attend urban schools. Along with many other criticisms (e.g. the conflict between distance to school and children's work at the farm), a strong contention against the reform was that the closure of a rural school might represent the final blow to destroy many localities which are anyway suffering the breakdown of their social fabric.

¹²⁰ Solís train station was still considered in the last population census to be the only urban centre in the district, though its population dropped from 300 in 1943, to 138 in 1985 and then to 90 inhabitants in 1996 (Chiarino and Saralegui 1996; DGEC 1989; INE 1997a).

envelopes as part of the address. He chose the name as a tribute to the patron saint of the local Catholic chapel, namely '*Nuestra Señora de la Virgen del Rosario*', which was financially maintained at that time by his father (Plate 16). Nevertheless, it seems that the more recent installation, in 1988, of a rural secondary school in the village of Villa del Rosario has played a major role in the constitution of a relatively autonomous identity and the emergence of the idea of zone. Thus, it is not surprising that the name of Villa del Rosario began to appear in provincial newspapers when they were reporting the popular mobilisation and negotiations with the education authorities to build the secondary school in the village¹²². According to the current director, the catchment area of the secondary school describes a circle with a radius of 30km, and around a hundred students attend it during the school term (March-December) (see V. Montero 1996). The mixing of people of different localities in the secondary school has helped to further the integration of the region.

Besides the importance of the secondary school in the new meanings of the zone for local people, I shall mention other institutions that have also contributed to develop the village as a place in peoples' day-to-day life. They are, firstly, the communal health centre, with its own ambulance, which was created around 1987 and upon which people rely for first aid and dental treatment. Secondly, during my fieldwork, a communal sports hall was inaugurated, financed by the provincial government. Also, the proposed

¹²¹ During the 'Golden Age', Ortiz train station was a dynamic place, with a sugar beet storage barn and the headquarters of the local farmers' association (IPRU 1981).

¹²² In Villa del Rosario, there is a football team called '*Granjeros*' ['Farmers'], that has been participating in Minas's premier league almost since its foundation by the local school director in 1953. This team has appeared in newspapers always as 'the team of the 13th district' (see *Diario La Unión de Minas* 1950-1998), showing that Villa del Rosario has not been a significant place-name for non-locals until recent times.

implementation of a social housing project, MEVIR¹²³, to provide affordable houses for older people and young couples, seems to further reinforce the significance of the village at the provincial level. The above transformations of the built environment seem to have complemented the presence of other social institutions like the police station, the football pitch, the dancing saloon, and the mentioned local chapel. I would suggest that the current process of the constitution of the village as a distinctive place manifests a shift from private capital to State intervention. At the beginning of its history, this rural settlement followed the impulse given by private businessmen, who not only contributed to the development of the official school, but also kept going the religious life of the community around the local chapel. Nowadays, by contrast, the village 'survives', thanks to the direct intervention of the State through both provincial and national governments. Besides political interests (i.e. electoral propaganda) in helping the village, the organisation of the community has played a fundamental role in achieving those improvements and the current maintenance of social services. It could be said, without hesitation, that local people have appropriated the village as their place, even though the category of 'local people', in this case, means a minority of active farmers and rural agents, who nonetheless seem to have the support of the more passive majority.

Another important point is that the emerging zone of Villa del Rosario has become a place for interaction between scientific and tacit knowledge. This is not just due to the education programmes of both the elementary and secondary schools, which stress the importance of articulating universal science and local practical agriculture. Villa del

¹²³ MEVIR stands for Movimiento de Erradicación de la Vivienda Rural insalubre (Movement for the eradication of the rural unhealthy dwelling). It is a Catholic inspired para-state

Rosario, and its zone of influence, has also become the focus of activity of at least three different teams of rural extensionists oriented to sheep-farming, pig-production and dairy farming respectively. Local farmers recognise in the presence of agricultural technicians one of the main differences between their zone and others in the provincial context. Although some farms might participate in different extensionist projects, there is a strong trend towards the constitution of function-based networks, rather than those based on kinship or neighbourhood. A possible consequence, following Green, might be the 'compartmentalisation of know-how and a decrease in the total span of the collective memory' (ca. 1994 :312). In short, the specialisation of farms, enhanced by the work of specialised extensionists, might contribute in the long term to a weakening of the significance of the zone for the economic survival of individual farms.

I found it significant that people did not differentiate the physical environment of the farm from that of the zone. In other words, the zone's landscape is a continuation of the farm's landscape. The zone has changed in a relatively homogeneous way, following the shaping of the individual farms. Nonetheless, there is a new salient component of the zone's bio-physical environment, which emerged without the direct intervention of family farms, namely the expansion of forestry plantations (mainly of eucalyptus trees). Industrial forestry has become an officially promoted form of land use since 1987 (Cousillas and Castaño 1996), with various tax exemptions in areas that might present a high degree of soil erosion or other constraints for arable farming. Surrounding Villa del Rosario nowadays, there can be found medium and large forest plantations, though their extent is still less than in the centre and northern parts of the province. Farmers hold divergent opinions about the consequences of this change, in most cases based on

other people's testimony or rumours, or even the confusing reports of the mass media, rather than on immediate experience. On the one hand, some people feel that the planting of forests has contributed to the reproduction of agricultural pests like small parrots and wild boars (Damiani 1990). Interestingly, a material change that, in theory, would fit into the notion of the human domination of fields and nature, is nonetheless perceived and categorised as the creation of a wild space, proving that the definition of 'wilderness' is not technical but social and even politically constituted (Knight 1996). Unlike small forests or isolated trees on the farms, people's narratives of industrial forestry did not reflect the embodiment of social memory. On the other hand, many farmers stated that forests act as barriers against cold winds and consequently have made the local weather more temperate, which, in turn, affords more favourable conditions for cattle raising. Apart from their differences, both groups of people assert that forestry might provide labour opportunities in the area. In short, everybody agrees that industrial forest plantations have changed the visual landscape of the zone, though nobody ventures a definitive conclusion as to the current or potential consequences of such a change. Moreover, despite the mobilisation of environmentalist groups at the national level, I did not hear local people claiming that they might, at least, have something to say about the development and expansion of industrial forestry. Following my previous idea that local people see the zone resulting from the combined activities of individual farms, I would suggest that this example highlights farmers' strong conviction that the private right to decide how to work the land is an incontestable principle that the national laws refrain from interfering with (Cousillas and Castaño 1996: 27).

It should be clear by now that the experience and meaning of places among rural producers in general, and dairy farmers in particular, are changeable. Furthermore, in the perception of places, there is always a tension between permanence and change. As Casey points out,

Places are at once elastic—for example, in regard to their outer edges and internal paths—and yet sufficiently coherent to be considered as the *same* (hence to be remembered, returned to, etc.) as well as to be classified as places of certain *types* (e.g., home-place, workplace, visiting place). (Casey 1996: 44)

In previous paragraphs, I pointed to the presence of centripetal forces that have led to the consolidation of a zone's centre in the village of Villa del Rosario. Yet, to fully understand this process we need to look at a simultaneous, centrifugal process of stretching the practical boundaries of the zone for local people. The increasing mobility of people and goods seems to be the main reason for the sense of expansion of the zone towards not only other rural settings, but urban centres as well. Certainly, the physical constraints on travel have been reduced to a degree that 'time' appears in people's perceptions as the only real barrier to travel from one place to another. Old people might recall the difficulties encountered in reaching the town or other locations when rivers had overflowed. Moreover, many of them mentioned the long journeys they had driving cattle to market. It was necessary to find grazing land on the way, which would have meant not only personal knowledge of the physical environment but also knowing the owners of the land, who might have given permission for the animals to stay in their fields overnight. However, underlying the current temporal salience of travelling is differential access to the means of transport, which depends mainly on social class. Therefore, we should be aware that the appropriation of place is not equal among local people, assuming that travelling is a way to engage with, and consequently to know the affordances of the environment.

The 'transport revolution' of the 1990s, which is reflected in an increasing private use of motorcycles and cars, plus the expansion of public transportation (Figure 10; see also plate 18), has stretched the sense of the zone as travel times have been reduced¹²⁴. To be sure, the livelihood of farmers was never restricted to the traditional neighbourhood or locality boundaries. This is particularly clear in the fact that the life of many local people begins and ends in the provincial capital: new babies are born in the town hospital and the bodies of the dead are exhumed '*at the other end of Minas*', as farmers usually refer to the position of the cemetery. Yet, nowadays the transgression of the zone's limits has become part of people's naturalised *habitus* in everyday life. Today, the circulation of goods, information, and persons is not only an economic reality, but also a goal in itself among the people. In this sense, local people are modern. As Schivelsbuch pointed out,

The notion that communication, exchange and motion bring to humanity enlightenment and progress, and that isolation and disconnection are the obstacles to be overcome on this course, is as old as the modern age. The bourgeois cultural development of the last three centuries can be seen as closely connected with the actual development of traffic. (1986: 197)

Consequently, the traditional links between urban settlements and rural communities (Martorelli 1982) have been reinforced. However, against the commonly held idea of the 'urbanisation' of rural people's livelihoods and values (e.g. Riella 1993: 89), I would suggest that local people are actively involved in the appropriation of the urban

space. It is not that the 'city' expands unilaterally towards the countryside and encroaches on the rural communities, but rather that rural dwellers incorporate towns as integral parts of their appropriated space. For instance, family dairy farmers (mainly men) have expanded the distance and frequencies of their travelling due to increasing trade and bureaucratic activities. They have to travel at least once a week to Minas, San Ramón and Montevideo, to mention the most frequent destinations. Also, access to faster means of transport has allowed daily commuting to work and education among family members. The commuting of labourers between Villa del Rosario and Minas, though difficult to quantify, has steadily increased to the extent that a local radio presenter has called the former locale '*the first dormitory town of Minas*'; perhaps more a premonition than an accurate observation.

¹²⁴ The effect of the transport revolution in inducing the seeming sense of estrangement from the physical environment in modern societies needs further research. I would suggest, following Schivelsbuch (1986), that for terrestrial means of transport the combination of high speed and the building of straight and smooth highways afford the decoupling of human movement and perception. People who are driven in a car or coach at high-speed over a surface without salient variations along the way would experience more distantiation between their sentient bodies and the 'external' world. To walk through the central corridor in a coach at 90km/hour would not help a person to feel the surrounding environment. Moreover, to gaze through a car's window driven at high speed draws attention away from the affordances of the foreground (See Brey 1999: 166; also Rodaway 1994: 125-6).

		1880	1900	1920	1940	1960	1980	1990-
walking								
horseback								
stage-coach								
railway								
bicycle				???????				
motocycle								
coach								
tractor								
car/truck								

Figure 10. Historical development of means of travel in Villa del Rosario.
After Barachini (1981), and fieldwork.

An important practical consequence of the increasing interconnections between the rural areas and towns has been a revaluation of the 'rural' setting as a healthier and more pleasurable place to live. This might be just an ideological construct of space or 'topology' (Brosius 1999: 281) from the urban middle classes (promoted also through the advertisement of property speculators), appropriated by rural dwellers to justify the continued existence of their households despite the difficulties of making a living from agriculture. Nevertheless, the more frequent experience of the city helps to give rise to what seems to be an assessment based on direct rather than on indirect perception. The discourse of local farmers is full of ambiguities in this respect. The city is still portrayed as having more economic possibilities, though they well know that industrial unemployment is high and that small businessmen go often bankrupt. Moreover, especially for the youngsters, the city embodies better opportunities for entertainment, and seemingly, a more favourable and less controlled context in which to meet a sexual

partner. On the other hand, its 'artificiality' is regarded as a negative attribute. Also, the more accelerated rhythm of daily life in the town is seen as unhealthy for the body and mind (especially in the case of the capital of the country, not so much in the case of the provincial capital). Furthermore, the city represents a place of physical violence between people and against private property. On the contrary, in most cases and during conversations not only with outsiders but also between them, farmers display an image of the rural areas in general, and their zone in particular, as a place of personal and collective security and tranquillity, where people might still trust each other, and where food is healthy, to mention just the most commonly mentioned attributes.

Despite the fact that local people might find in the rural setting many examples of the negative features of cities (e.g. homicides), and conversely, parcels of 'rurality' in some urban neighbourhoods, the dichotomy between these two places has been reinforced. What seems more important for my purposes is that this dichotomy is commonly expressed by linking the opposition between the rural and the urban to that between the natural and the artificial. Yet, in accordance with currently dominant evaluations of these topologies, nature means order whereas artificiality means disorder. Moreover, the concept of 'wilderness', traditionally associated with nature and the countryside, is nowadays felt to be more aptly applied to the urban setting, and hence to 'civilisation' in general.

Local place, global space

Until now, I have been dealing with what in the literature is referred to as the constitution of the 'local'. In this sense, the theoretical model of cultural 'emplacement'

seems to work well to describe and analyse people's actions and symbolic representations of place, returning to the centre of the scene the engagement of the person with other persons and with other components of the material world, as the source from which cultural values of places emerge. However, the stress on the phenomenological connectedness between people and places, and their mutual constitution, seems to me to present certain problems in explaining some cultural phenomena in the context of the current development of globalised spaces. I believe that the person-environment approach gives scholars only a partial tool to grasp the differential power relations involved in the constitution of places and spaces, in an increasingly interconnected world (Wolf 1994 [1990]). How does one explain that at the same time that a community of practitioners might be exploring and developing the affordances for their practice of a particular place, another group of people might be acting in a different setting, perhaps completely detached from peoples' 'place', but with real or potential consequences for the shape of the former group's environment and consequently, for their livelihoods? The following example might better illustrate my point. As mentioned in chapter 2, since 1991, Uruguay has become a full member of the *Mercosur*. Even before that time, the idea of an enlarged market place in which to buy and sell commodities provoked intense debates among local dairy farmers, reflecting similar discussions as may be watched, listened to or read in the mass media, about the emerging risks and possibilities for the future livelihood of the country's citizens in the face of the economic and political power of two of the common market partners (i.e. Brazil and Argentina). From the beginning of this process of regional integration, official propaganda stressed the fact that from then on Uruguayans shared a 'common place' with almost 200 million other people from neighbouring countries. Moreover, underlying this ideological construct was the assumption that the new

regional identity would easily emerge, especially if presented as the only alternative to struggling collectively against other international attempts at block formation like the EU and the NAFTA. Definitely, the current regional integration has been characterised by a top-down decision-making process, in which the majority of the people have had little say. Initially, the regional integration process had no real impact on the way people carried out their lives. However, as time passed by the existence of this 'virtual place' crystallised mainly in commercial agreements to decrease the national taxation on imported goods from the region, and consequently the abstract market shifted to a more tangible and interconnected reality. For instance, in September 1999, eight months after a severe financial crisis in Brazil, a dairy family wrote the following to me:

The livestock sector is not experiencing any change, unlike the dairy sector which surely will be affected by the Brazilian stock exchange crisis. It is supposed that Brazil would decrease its costs of production leaving us without our main export market for milk by-products.

The most apparent effect of the Brazilian crisis for local dairy farmers was the lowering of the price for milk paid by the Co-op. This example shows that the consequences of the dynamics of the *Mercosur*, very much related to the globalisation of capital though not absolutely determined by it, have been felt in peoples' daily life without their being engaged in direct relations either with the people or with other constituents of the world from other countries. From a phenomenological perspective (Lave 1993: 18), it might be claimed that the *Mercosur* did not exist for people until some more tangible elements were felt. However, it was presented as a political and economic space before that.

Likewise, some governmental projects have been implemented with a view to a reconstruction of the transport system in the area under study in order to facilitate the

transportation of wood from the country's central and northern industrial forests to the main export port in Montevideo¹²⁵. During the period of my fieldwork, the main roads were indeed refurbished. Also, the local petrol station was moved from a marginal location to the main crossroads in the area to attract lorries and cars driving through on the main roads. When asked about the reasons for these changes, people only had vague answers, if any at all. They just mentioned the benefits these changes might provide for their day-to-day practices (e.g., faster driving). Again, a group of technocrats had decided, without general consultation, the future spatial arrangements of peoples' place, including increased lorry traffic.

I do not deny that ultimately the meaning of place is constituted in the daily engagement of people in the physical world and with other people. Yet, the relation between places and these kinds of spaces requires more attention from anthropologists. I shall return to this point in my conclusion.

Conclusion

In this chapter, I have shown that the components of the environment are not perceived by dairy farmers and other rural agents either as isolated entities or as an undifferentiated continuum, but rather as nested in places, i.e. consolidated locales of past and present human activity. I have identified the most relevant places in people's environment: the farm, which includes among other nested places the house, the household compound, the milking parlour, and the fields; the neighbourhood, with its

¹²⁵ There might also be the chance to build the road axis between the south of Brazil and Buenos Aires, the capital of Argentina, through the 13th District where Villa del Rosario is located, in

rather flexible boundaries; and the zone, which presents clear material and symbolic 'attractors' in the village, the road and towns.

Farmers are active participants in modifying their habitats to make certain affordances available (Reed 1996: 113). This has been exemplified by the organisation of space in the house and the household compound to cope with the different needs that arise in relation to the shift in the economic orientation of the rural enterprise. In particular, the milking parlour appears as the objectified form of the links between families and the dairy agribusiness. Moreover, I showed that both the house and the compound are objectifications of the relations between the older and younger generations of farmers, and of the tension between peoples' attachment to, and detachment from, the land.

On the other hand, it was shown that peoples' perception of their fields has significantly changed due to their use of new agricultural techniques. These new techniques involve not only machinery, agricultural inputs and practical knowledge, but also the exchange of information between farmers and rural extensionists as well as access to information through the mass media. Moreover, the emergence of new affordances in the realm of the fields cannot be explained without taking into account the mediating role of the Dairy Co-op, as the main provider of the means of production. I argued that dairy farmers have been guided to develop a more integral view of their fields and a more abstract notion of their farms. The latter was highlighted through their representations of the farm in drawings, as well as their sense of the scarcity of space for the reproduction of the household economy.

order to facilitate the road transportation of goods between these two major economic poles of the *Mercosur* (Ponce de León 1999).

The neighbourhood and the zone were depicted as places whose boundaries are much more flexible than those of farms, and which are very much informed by the establishment of social networks. In other words, there are different neighbourhoods and different zones depending on people's life-historical trajectories through the physical and social environment. Having said that, the historical confluence of these different trajectories promoted the consolidation of relatively bounded locales, like the village of Villa del Rosario with its various nested places, which afford current access to education, shopping, and recreational services, to mention just the most relevant activities. I have also stressed the role of the State as an active participant in the constitution of the zone as place, without neglecting the continuous organisation of the local people clamouring for such involvement. Furthermore, I emphasised the continuum between the rural area and the towns, as part of peoples' sense of their zone. The improvement of communications, as well as more generalised access to the means of transport and means of immediate communication, have afforded the appropriation of the urban space and 'urban culture' by local people. I pointed out that, on the one hand, the city has become an integral part of farmers' lived world, while on the other, contact with the urban setting has led to a revaluation of the meaning of the 'rural' as place. The latter has meant the emergence of a detached notion of nature among farmers, as something that could be enjoyed or even consumed, though the meaning of the rural place as affording agricultural activities is still dominant.

Beyond the zone, I pointed out that there exists a conceptual space, which in principle cannot be directly perceived. Yet, it has significant consequences for local peoples' livelihoods. Perhaps the presence of conceptual spaces like the nation-state or the *Mercosur* in peoples' discourses does not affect the perception of places, but we need to

disengagement, where practical and scientifically informed knowledge have a relatively symmetrical relation. On the contrary, the other notion of space (i.e. nation-state, regional block) is imposed upon the world by a group of detached observers, with very practical consequences for people who dwell in particular places. The latter might have economic and cultural resources to accommodate themselves to this externally made image and reality, or even to resignify them in material and symbolic terms, but they always do it retrospectively and not always successfully. Indeed, we might say that people work out their places from space in a process which leaves narrower possibilities for those who are economic and politically disempowered.

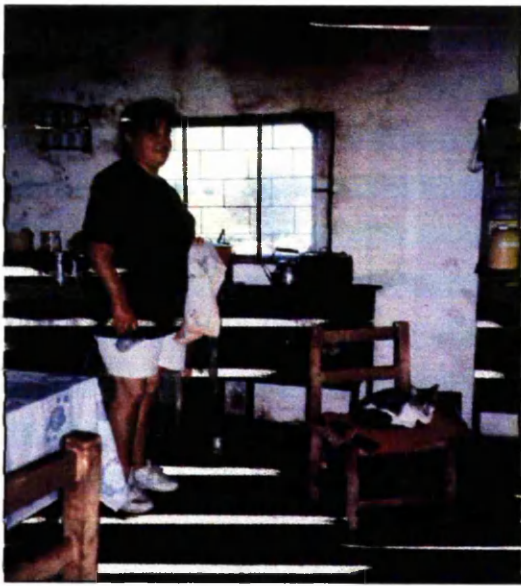


Plate 11. The interior of a house.



Plate 10. Farmers in front of their milking parlour.



Plate 12. Milking parlour. (Above)



Plate 13. Boy in the fields. (Right)

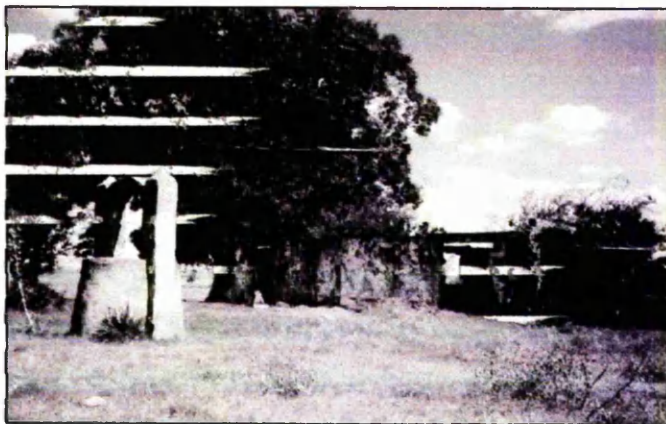


Plate 14. Abandoned house or *tapera*.



Plate 15. The local school and catchment area according to schoolchildren's view.



Plate 16. The interior of the chapel.

Plate 17. Schoolchildren



Plate 18. Motor transport. (Left)

Plate 19. The zone, according to schoolchildren.



Chapter 5. Environmental rhythms and the attitudes of *Canarios* towards time.

Saint Augustine was once asked: what is time? He answered: 'If no-one asks me, I know; if I wish to explain it to one that asks, I know not'. (Sebeok 1988: 71)

Introduction

During my field research in Villa del Rosario I found that farmers, describing their current way of living, continually complained about 'lack of time'. Moreover, when people in their forties or older compared their current situation with that of the previous generation, they always emphasised the recent increase in the pace of both social events and working practices. On the other hand, urban dwellers who visited the area expressed their amusement, and often envy, about local people's 'relaxed' way of doing things manifested, for instance, in their seemingly unconstrained allocation of time to the hosting of unexpected guests on their farms. Moreover, it is common to hear from outside observers, as well as local people, that rural people follow the rhythms of nature whereas urban people have submitted themselves to the sovereignty of the clock, and hence to an artificial punctuation of the rhythms of individual and collective life. For instance, in recounting his recent visit to a tourist ranch an urban visitor made the following observations:

We arrived at dusk, watching the sunset. We were transported to past-times; old buildings and a way of life without urgency, proper to people of the countryside. (O'Brian 1998)

This pervasive idea that rural dwellers live in a somehow lost and better past time, without the encroaching needs of rapid modern life, is quite recent and, I would suggest,

manifests more the discontent with the current urban life style than a real assessment of what is happening in the social life of rural people.

Significantly, the distinction made by public opinion in Uruguay between those sectors of society who live following the rhythms of nature and those who have adapted their habitus to the rhythms of an artificial environment, seems analogous to commonly held classifications of societies and cultures in social anthropology and other social sciences. The greatest theoretical difference has been drawn between Western industrialised or modern societies and the other pre-modern ones. Whereas non-industrialised societies are characterised generally as having a sense of time embedded in the total network of social relations and the practical engagement with natural rhythms—sometimes called ‘social time’ (Ingold 1995: 9; see also Munn 1992) or ‘task-oriented time’ (Thompson 1967: 61)—people in modern industrial societies are supposed to regulate their working practices and, increasingly, their leisure activities according to an abstract, linear, and reversible kind of time, sometimes called ‘clock-time’ or ‘commodity-time’ (Adam 1998; Ingold 1995: 14). According to these two frameworks, non-industrialised or pre-modern societies may not conceptualise time as a detached or abstract scale for measuring environmental events (e.g., Evans-Pritchard 1940), but may experience and represent the passing of time as an integral dimension of the process of ‘forthcoming’—i.e. the unfolding of the potentialities of living and non-living entities in the surrounds of a perceiver (Bourdieu 1966). Therefore, time consciousness among pre-modern peoples is believed to be anchored in the real (or sometimes imagined) life histories of persons, animals, mountains and landscapes, but would never be seen as something moving on its own independently of human agency, as it is commonly acknowledged to

do in the modern 'structure of feeling' (Williams 1977). As Huber and Pederson clearly put it,

In modern societies time and space are abstract and 'external' categories. In pre-modern societies they were integrated, 'internal', aspects of localised modes of social life. Time was 'embedded', or contained *in* localities. It was linked to work on the land, to rituals, markets and other local, social activities, and to the cycle of the seasons. (1997: 579)

Moreover, studies of the impact of modernisation upon pre-industrial societies generally acknowledge a linear evolutionary model which stresses the shift from 'task-oriented time' to 'clock-time' (e.g., Bourdieu 1966; Thompson 1967), and the consequent displacement of people's awareness of their natural environment from the centre of their life in general and the labour process in particular (Mumford 1967: 286; Zerubavel 1981: 44). However, recent studies in social anthropology have shown that the activities of people may resonate with both social and natural rhythms, neither of which assumes any predominant role in influencing people's perception of events (e.g., M. Harris 1998). Also, the radical dichotomy between Western and non-Western societies, based on their differential attitude to, and conception of, time has been qualified by pointing out that, in industrialised societies, senses of time can be found that are based on individual and collective activities which are embedded in the particularities of the location and the social arrangements among people, without reference to any abstract timetable or schedule that should be obeyed (Adam 1994); and conversely, that pre-industrial societies show not only seasonal or 'cyclical' but also linear understandings of highly regulated temporalities (Thrift 1996, chapter 5).

It is my contention that *Canarios* dairy farmers' dominant attitude towards time is based on a basic and tacit notion of temporality which emerges through the tuning of local

people's perception to the irreversible sequence of practical working activities. The latter, in turn, are scheduled following the rhythms of both social and natural local environmental events. Having said that, I shall argue that the temporality of local people is increasingly influenced by the need to cope with 'clock-time' or 'commodity-time', a seemingly fundamental characteristic of people's subjectivity in industrial societies. However, I shall argue that none of these temporalities has completely replaced or subsumed the other historically, but both of them have co-evolved in complementary though contradictory ways. In other words, this chapter has the purpose of describing and analysing the connections that local people make between task-oriented (or social) and clock-oriented temporality. Moreover, it attempts to explain why 'time' seems to be increasingly estranged from local conditions of production and sociality, or why (and how) time has come to be something to struggle against, rather than an integral element of the development of social life in a particular environment.

I shall proceed by presenting two realms of dairy farmers' reality: (i) the tension between task-oriented time and clock-time in the daily cycle of activities; and (ii) the tension between seasonality and the rhythms of the market. I shall then discuss the relations between these different temporalities.

The relations between task-oriented time and clock-time in the daily cycle

The *Canarios* dairy farmers in Villa del Rosario attune their activities, in principle, to the alternation of daylight and darkness. However, as I shall show, this alternating rhythm is constituted not only by the phenomenon of the sun's movement in the sky but

also by arrangements in the social domain¹²⁶. In the following time-space diagram, a typical day on a dairy farm is depicted in schematic form.

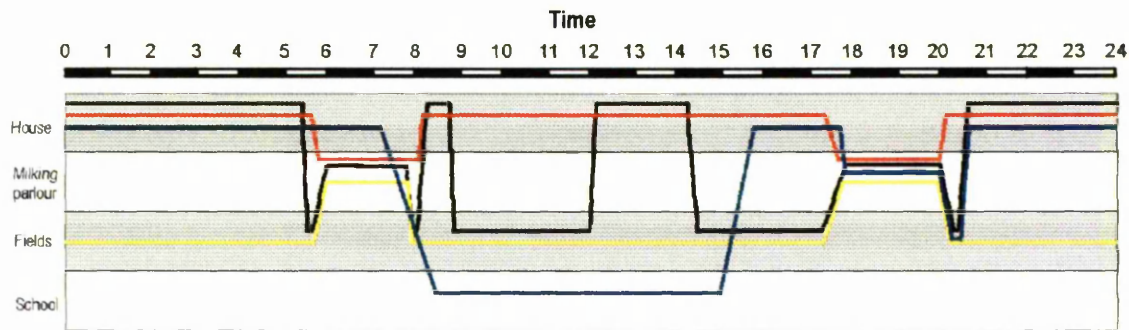


Figure 12. A workday on a family farm.
Key: Man (black); Woman (red); Boy (green); Lactating cows (yellow).

The above diagram shows clearly the main spatial nodes of activity in the household estate, i.e. the farmstead, the milking parlour and fields. Also, it shows that school can be relevant if there are children over 6 or teenagers in the household. Moreover, it depicts the punctuation of the rhythms of the daily cycle centred on three main time-markers, intimately related with the above-mentioned places: meals, milking and schooling. It must be said that this representation of the daily cycle is abstracted from a more complex interaction between activities that might not only vary from day to day, but also respond to different timings according to a weekly pattern, as can be seen in the time-allocation tables of a single family presented in appendix E. Having said that, it is my contention that underlying such complexity can be found nodes of practices that punctuate the daily schedule of almost all family dairy farms in Villa del Rosario.

¹²⁶ In passing, I would suggest that future anthropological research on the personal and collective rhythms of daily life should take into account the discoveries in chronobiology on the interface between endogenous and external factors in the 'entrainment' of Circadian rhythms and its consequences for human performance (Cofer et al. 1999). Our knowledge of socio-cultural environmental conditions for the development of pre-objective time-schedules might be enriched with the contributions of scholars from the natural sciences who have attempted to overcome the traditional dichotomy between culture and biology (e.g. Fogel 1999).

Men and women wake up at dawn and get together in the milking parlour for milking. Afterwards, adults take advantage of daylight to conduct most of the working activities both in the fields (mainly men) and on the farmstead (mainly women). Whilst children are at school, adult farmers come together again for lunch in the residential house only to split up again in the afternoon. The evening milking leads the family members to meet in the milking parlour. When the milking is finished, and the sun has already set, everybody gathers in the house for dinner and company.

Local dairy farmers, particularly the older ones, keep the habit of waking up very early in the morning, even before sunrise. To wake up early is socially recognised as a sign of being hardworking, expressed in the common Spanish saying: 'God helps those who are awake at daybreak' [*Al que madruga Dios lo ayuda*] (Soto Posada 1997: 134). It is not surprising that one of the most popular radio programmes, at least among adult farmers, starts at 6:00am. These farmers also prefer to be home by sunset. On the other hand, waking up 'late' implies laziness; the kitchen clock acts as a reminder of 'being late', and people do criticise themselves for this. The main concern about starting late in the morning is that the 'working day' would be extended until late in the night due to the relatively fixed interval between milking shifts. Moreover, people would have to delay activities in the open air which require natural daylight.

The quite recent combination of electric lighting and private transport has changed the temporal pattern of activities in relation to day and night. Indeed, the realm of the 'traditional' day has expanded. As I shall show, the flexibility of daily schedules, which relies on the artificial lighting of the farm, has increased. This might be seen as part of the modern process of the 'colonisation of the night' (Thrift 1996: 268). For instance,

the electric lighting of the milking parlour affords more flexibility in the time of starting both morning and evening milking shifts. Furthermore, the colonisation of the night has been enhanced through the generalised use of tractors with front and rear lights, which allow ploughing and some other work in the fields to be done while it is dark. It is common, especially during the warmer summer nights, to see (or rather to hear) the roaring of tractors as they till the still moist soils. On the other hand, the progressive colonisation of the night has changed peoples' habits in the realm of the farmstead. The most salient difference from the recent past has been the centrality of watching television, both individually and collectively (see below). Furthermore, the 'day' has also been extended into more public arenas like the recently opened communal sports hall, where the young and the adult men gather in the evenings to play football. Finally, youngsters and single adults might go to local bars or, more frequently than hitherto, they might travel to nearby towns for 'leisure' (e.g., dancing), especially during weekends. It is not uncommon, for instance, for single youngsters who might have been dancing or partying during the night, still to participate in the morning milking routine, if necessary, and then to go to sleep in the 'middle' of the day. Although sometimes disapproved of, this routine is accepted as part of the 'youth stage in life', normally until marriage.

Besides these changes, the rhythms of the daily cycle follow the particular sequential order of activities. These activities are not absolutely fixed in terms of an abstract time scale. Nevertheless, farmers do not 'create' the day from scratch every time they wake up in the morning; there is a certain expectation, a time-schedule, though it might not be explicitly announced or discussed between persons. As mentioned above, milking, family meals and schooling might be defined as the salient time-marker that guide

people's attention to the passing of time over the day. Although the precise of each of these activities or tasks is always changing, the fact that the time and place of their performance remain more or less the same is conducive to their functioning as time-markers (cf. Strathern 1988: 266). Let me briefly describe each of them.

The Cattle-clock

Looking at the above time-space diagram again, we can consider dairy farmers' perception of daily time to be closely attuned to a 'cattle-clock' (Evans Pritchard 1940: 101). I believe the use of the term 'cattle-clock' is quite ambiguous, but that this ambiguity reflects the mixture of 'natural' and 'artificial' elements involved in the practice of dairy farming. There is, among modern dairy farmers, a constant tension between understandings of the cow as an autonomous living organism and a man-made biological machine (see chapter 6, part 2). The temporal dimension of such tension seems fundamental to the evolving social life on the farm and, moreover, resolving this tension on a daily basis is one of the dairy farmer's skills. The different aspects of the 'cattle-clock' are related, mainly, to cattle feeding, cattle driving, and milking. Elsewhere I elaborate on the implications of the biological-cum-cultural process of oxytocin release in dairy cows. Here it is sufficient to note that the production of milk by a cow continues for 24 hours a day during lactation, and its speed remains relatively constant for 15 hours. If, after that interval, the cow has not been milked, the pressure on the udders slows secretion and can even lead to certain udder diseases (Leaver 1983: 120). This is the 'biological' reason why Uruguayan dairy farmers milk their herds twice a day, with an interval of ten to twelve hours between the morning and the

evening milking shifts, and between the latter and the next morning shift¹²⁷. Even when the quantities of milk per cow are low, due to shortage of forage, farmers normally drive their milk cows to the milking parlour twice a day, to keep to animals to their routine. Dairy farmers stress the importance of keeping the twice-a-day routine; as they say: *'It is preferable to throw the milk away than to leave the cows unmilked'*. Otherwise, it seems to take a couple of days to restore the cows to their regular temporal cycle. The point here is that the cattle-clock cannot be understood as external to human performance, since we are dealing with animals, that are already 'humanised'.

Before the installation of bulk tanks on the farms, dairy farmers had to co-ordinate their morning milking routine with the passage of the lorry which collected their milk churns (Plate 21 and 22). As well as fitting in with a 'cattle-clock' they had to cope with a 'transport-clock'. People used to start milking around 4:00am, in order to be able to send their churns with the lorry which collected them at 6:30am. Therefore, the introduction of this new storage device in the 1990s has given more flexibility to one of the most important daily activities. Far from furthering a shift from task-oriented to clock-time, I would suggest that task-oriented time has been actually reinforced by this technical change.

From the above analysis it could be concluded that (i) family dairy farmers have to organise their daily activities according to self-regulating processes in cattle; and (ii) these processes nevertheless cannot be seen as independent of humans' own goals and

¹²⁷ To milk the cows only once a day might result in diseases of the udder and the distress of animals whilst moving or lying in a paddock. On the other hand, to milk the cows more than twice a day means more human effort and financial costs oriented to this job, without better economic results in small and medium scale dairy farms.

skills. Indeed, there seems to be a dialectical development of temporality constituted by animal-human co-ordination. As Clough pointed out,

Whatever assessment is made of the detailed knowledge of the milking machine and the dairy cow [...] the fact remains that the [...] lactating dairy cow, herself working twenty-four hours a day, imposes the age-old rigid discipline on the lives of dairy farmers and their employees. Every day of the year begins and ends with milking. The task occurs with monotonous regularity and has a dominant influence on daily work schedules. (1977: 201)

Nevertheless, the human element has become the more determinant pole of the relation, though not absolutely unconstrained (I return to this in chapter 6, part 2).

Meal time

Meal times are important activities in the organisation of the daily cycle of activities and the co-ordination of personal schedules. In particular, lunch time is an almost unavoidable 'break' at midday¹²⁸. Indeed, farmers refer to lunch time as 'doing' the midday [*hacer mediodía*]. Lunch-time marks the middle of the working day. It might mean changing the type of activity people are conducting, though not necessarily. For instance, one informant said that for him the afternoons are shorter than the mornings, so he would not start to plough a new paddock after lunch and before milking, but perform shorter tasks (e.g., to prepare the feed ration for the hogs). On the other hand, lunch-time seems to be closer to a notion of 'clock-oriented' activity. It is a serious 'fault' to be late at the table. Indeed, the housewife who has prepared the meal might

¹²⁸ In a radio interview, one of the most well-known radio presenters among rural producers spoke of the time of his two daily programmes, i.e. at 12 noon and 5:30pm. He explained that seasonal changes of daylight make the later programme more difficult for farmers to listen to out of wintertime. About the midday programme he noted: 'I believe that the 12:00 programme is the best for the whole family, because by that time all the people approach the house and gather there. If the head of the household is not there by that time, his wife is listening to the programme' (Corso 1999).

call the rest of the family if time passed and they were not there¹²⁹. She might try to keep lunch-time 'on time', so that she can carry on with her other afternoon tasks. The clock not only helps to co-ordinate a different personal timing, but might also end up guiding it. Nevertheless, I would not go so far as to put this clock-orientation of the midday meal among family farmers at the same level as the fixed lunchtime in factories or offices. Besides other differences, lunchtime on the farms has a more or less clear beginning, but not so clear an end. Moreover, it is common to have a *siesta* after lunch, especially during the summer afternoons¹³⁰.

In the evening, dinner is also important, but it has a weaker meaning as a time-marker than lunch time. The food is not so elaborate, and sometimes family members eat independently. Nevertheless, to follow up the previous linguistic metaphor, in Spanish 'to do night' [*hacer noche*] means to eat something and go to bed. However, as I mentioned above, people nowadays carry on many other activities after dinner. Probably in the past, when there was neither electric light nor TV, nor access to faster means of transport, dinner represented the real end of the day until the next morning.

I return at this point to the significance of TV in the creation of more fixed schedules. Television has been an important component of farmers' domestic environment for at

¹²⁹ Morosoli stressed in his narratives the importance of lunchtime among traditional *Canarios*. For instance, in one of his stories, a father advised his son: 'Do not go far...we will call you to do midday' (Morosoli 1967:98). In another one, a widower is explaining to his brother why he was feeling so free after his wife passed away: 'Sometimes, I was ploughing for many hours but feeling as if I had just started, when she began to call me with loud cries: the meal is ready! The meal is ready! And you had to stop your job. You had to go to the house, otherwise she would keep screaming until dead' (Morosoli, 1944: 98).

least two decades. Before the connection of farms to the main electricity supply, local people used to connect black and white television sets to a rechargeable battery that, in turn, limited the time one could watch. Nowadays, one of the most common activities during the evening is to watch soap operas¹³¹. Consequently, farmers might tune into their TV sets at fixed times, just in order not to miss the day's episode. I believe that this is not a marginal phenomenon and probably requires further elaboration in terms of perceptions of time, considering that environmental events shown on TV are grounded in a temporality divorced from that of the real sequence of events in the lived environment.

School time

A new-born infant is raised in a relatively unscheduled environment until he is a toddler. At the age of six there is a significant change: children start to attend primary school. I am not able to elaborate in detail on the temporality within rural schools because this was not a central focus of attention in my research. Nevertheless, for my discussion, it is important to point out that children between the ages of 6 and 12 stay in this educational institution for around seven hours a day, over two-thirds of the year. There are several schools in the area under study, each one covering the population of a geographical area within a radius of 5 kilometres. (Plate 24.) As in the rest of the country, the local school has historically represented one of the most relevant centres of

¹³⁰ A British priest observed in 1868: 'in December, January and part of February, everything sleeps in the middle of the day' (Murray 1871: 99). This is almost true at the turn of this century. For those who would conduct field research not only in the rural areas but also in small towns in Uruguay, it is important to take into account the importance of siesta time for many people. Unless you have made an appointment, it is best to avoid visits to households between 1 and 3pm.

¹³¹ During my field research, almost every family watched a Brazilian soap opera called '*El rey del ganado*' [The King of Cattle]. The script revolved around social life on a cattle ranch, and people of both sexes felt this story was closer to their own reality than previous stories.

social life for rural communities (Chiarino and Saralegui 1996; Wettstein and Rudolf 1969). Public schooling, according to the official law, is free of charge, secular, and compulsory. It is common to find in the literature a strong concern with the difficulties experienced by rural children in attending school regularly, due to the lack of roads to reach the site when weather conditions are unfavourable. Moreover, and more important for my discussion, teachers complained of the absenteeism of children when they had to work on the farms to help their families. Neither of these problems is any longer in Villa del Rosario. Children have full access to schools. Public transport is free and parents want to send their sons and daughters to school, though exceptionally, children might stay at home to help adults, due more to the children's initiative rather than their parents' requirements.

Besides the social importance of schools as one of the most tangible manifestations of the State in the locality, and its significance in the annual social calendar, I believe the school plays an important part in the constitution of meanings of clock-time (see also Thrift 1996: 173). The yearly and daily school activity is highly regulated. The academic year runs from March to December, with three main vacation breaks: one week of vacation in April coinciding with Easter¹³², two weeks of 'winter vacation' in July, and one week of 'spring vacation' in September. Normally during the school term, lessons start at 9:00am, with a mid morning break for free playing (under the teachers' surveillance). At 1:00pm, lunch is served in the school's dining room and children go

¹³² The different names given to this week of vacation express the multiplicity of meanings it affords for Uruguayan people: *Semana Santa* or *Pascuas* (Easter week); *Semana Criolla* (Week of 'criollo' cultural traditions); and/or *Semana de Turismo* (Tourism week). The latter is the most common name in the area under study, though most of the people continue with their normal activities. Yet many visitors pass through the locality on their way to Minas and nearby resorts, and relatives from the cities might stay on the farms for a couple of days.

back home at 3:00pm¹³³. In the particular case of Villa del Rosario's school, most pupils travelled to and from it by public transport. This means that they had to be aware of the clock-time in the morning to catch the bus on the main road; otherwise, they had to cycle to the school or find a lift. I believe that local people develop a more disciplined rhythm of activities during their school attendance than they do on the farm. If there is an experiential basis for the distinction between work and free time during the day, I would suggest that it comes from the experience of participating in formal education. 'Work-time' as opposed to 'free-time' (e.g., vacations) is embedded in the plan of educational institutions. Barrán (1997) has shown that the strict regulation of time in school was one of the means used to 'civilise' the spontaneity of activities at the turn of the 20th century, after the implementation of the so-called 'Varelian' education reform from the 1870s onwards. The imposition of a bourgeois national project, centred in the apologetic defence of the virtues of disciplined work, required the creation of a new sense of order and temporality. Barrán presents several historical records which show the encouragement and inculcation of the moral benefits of punctuality, the division between study and play-time, and the equation of time with money based on the famous aphorism of Benjamin Franklin (Barrán 1997: 35-46 and 89-91). Nowadays, the civilising spirit of the rural school still stands, as well as the inculcation in pupils of the hegemonic conception of time¹³⁴.

¹³³ At the end of my field research, the timetable in one of the rural schools was extended once a week to allow pupils to travel to Minas for computer lessons. The children were delighted with the experience, and did not care about extra-school hours.

¹³⁴ It is no coincidence that the passage from 'free-time' to 'lesson-time' at school is marked with the sound of bells, as was the case in the monasteries of the Middle Ages when, according to Mumford (1967: 286), the most systematic attempts to 'domesticate' the rhythms of human activity took place (see also Thompson 1967: 64 for the relation between church clocks and time-discipline in the 16th century, as well as for the co-evolution of factories and schools in the rise of European capitalism; cf. Thrift 1996: 209-210).

To sum up, the everyday temporality of dairy farmers is characterised by a division between day and night activities, rather than between work and leisure. Among family dairy farmers, the distinction between work and leisure time is practically alien to their task-oriented perspective. However, the work/leisure distinction built into the commodity-time model is considered to belong to an alternative way of living which people frequently value even more positively than their own. Dairy farmers regard the supposed opportunity that waged-workers in town have 'to do what they want' as soon as they finish their working day as an advantage, whereas they themselves have to work regardless of the clock. Moreover, the holiday is a concept more imagined than experienced by adults in family dairy farming. Yet it is highly valued, too¹³⁵. (See Plate 20.) The lack of vacations or days-off from agricultural work is felt to be intrinsic to dairy farming.

On the other hand, unlike the Nuer people of Evans-Pritchard's famous account, *Canarios* dairy farmers consider time as '...passing, saved, wasted, and so forth' (Evans Pritchard 1940: 103). For example, a young farmer remarked, when assessing in historical perspective the replacement of oxen by tractors:

Today we cannot waste our time. We couldn't continue to work at the oxen's pace.

Just as Evans-Pritchard felt how lucky the Nuer were, lacking the experience of time as a constraint (ibid.), local people frequently idealise the past, when their parents or grandparents, according to their memories, '*lived in less comfort, but more tranquility*'.

I would suggest that dairy farmers might find problematic the predominance of task-oriented temporality, due to the tension experienced between the dominant social

¹³⁵ See Stanek (1993:57) for a similarly 'frustrating' conception of leisure time among Canadian dairy farmers.

ideology of time as something to be consumed (for profit or pleasure) and the real temporality of local biological and social processes. Zerubavel pointed out that,

A temporal order that is commonly shared by a social group and is unique to it to the extent that it distinguishes and separates group members from 'outsiders' contributes to the establishment of intergroup boundaries and constitutes a powerful basis for mechanical solidarity within the group. (1981: 67)

I propose that the social identity of family dairy farmers is intimately related to their experience of their differential time schedule determined by the combination of the dairy cattle-clock and the family-based organisation of labour. Both the temporal constraints of the cattle-clock and the constant negotiation of personal agendas to fulfil family labour needs on the household estate work against the possibility that young and adult dairy farmers might resonate better with the dominant rhythms of social life either in the rural locality or in the towns.

However, there is no clear evidence, in the case under study, that this experiential basis has led to the development of a collective or group 'mechanical solidarity', despite the generalisations that dairy farmers make, in their discourse, about the shared daily routine of cattle management and milking. By and large, local farmers' response the challenge of coping with different temporalities was biased towards the need for better agricultural technologies. Their imagined alternative did not include any change in the social organisation of work beyond the boundaries of their farms. Consequently, new technological inputs have become the sole means to gain 'time', reinforcing the idea that the problem is technical rather than social.

Seasonality, social time and the market

The second realm of my analysis of the perception of environmental events and the attitude towards time among *Canarios* dairy farmers concerns the annual cycle of activities. Figure 13 shows the relations between the seasons, the agricultural calendar and the 'non-working' social calendar.

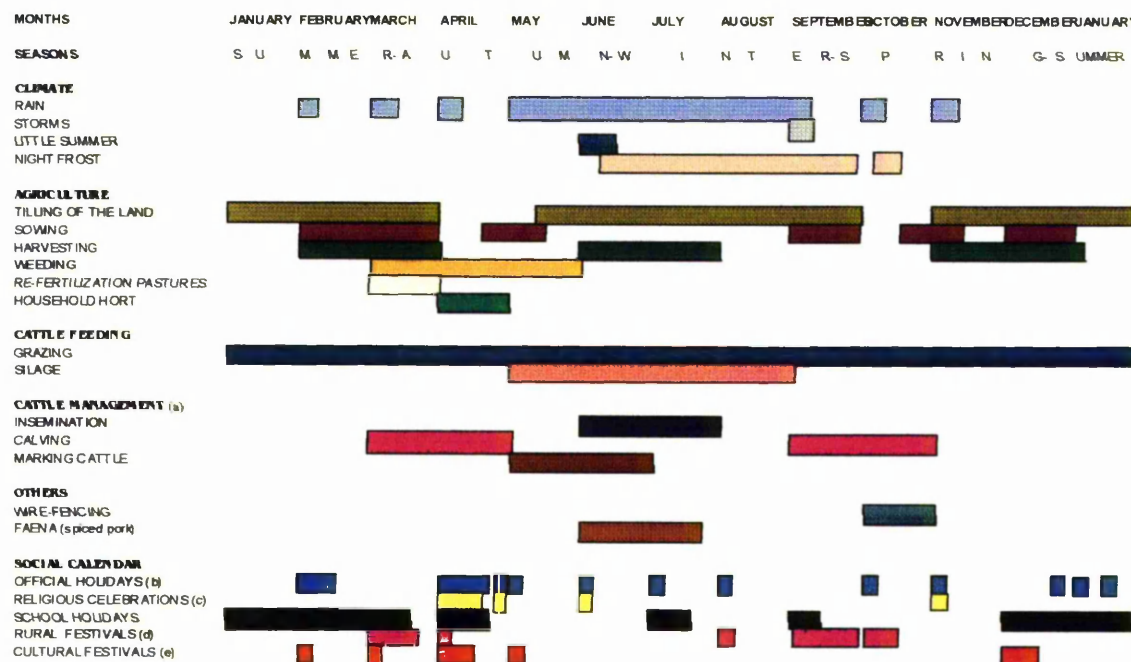


Figure 13. Seasonal, work and social calendar.

Notes:

(a) Cattle Management: this calendar for artificial insemination and calving is just the ideal one according to scientific planning. In reality both insemination and calving often occur throughout the year following animals' own biological cycles.

(b) Official holidays: January 1st (New Year's Day), 6th (Magic King's Day); February 3 days of Carnival (not fixed); April Tourism Week (coincides with Easter), 19th (Landing of '33 orientales', celebrating beginning of the independence war); May 1st (Labour Day); June 19th (General Artigas' birthday); July 18th (Constitutional Law Day); August 25th (Independence Day); October 12th (The Day of the Race or Discovery of America); November 2nd (Old Saint's Day); December 25th (Christmas Day)

(c) Religious celebrations: These are the days which have a minimum of religious connotations at the local level. April, no fixed dates (Easter), 19th (Peregrination to the shrine of the Virgin of Verdún) (see Plate 23); May 15th (San Isidro's Day); June 12th (San Juan's Day); November 2nd (Old Saint's Day); December 25th (Christmas Day).

(d) Rural festivals: Local farmers did visit, and sometimes were active participants in, several exhibitions of agricultural work and produce. Most of them took place in Minas, though a very important one with demonstrations of modern agricultural machinery was organised in the province of Colonia, around 300 km away from Villa del Rosario. Ironically, the most popular rural festivals take place in Montevideo yearly in April and September.

(e) Cultural festivals: Music concerts and folklore demonstrations are commonly associated with rural festivals, though sometimes they are organised independently. I include as cultural festivals those charities organised by rural schools to collect money to complement public funds.

It can be seen from the above table that there is no a clear-cut correspondence between the seasons—with their particular weather features—and the rhythms of agricultural activities. Consider for example, the task of ‘tilling of the land’. It continues almost throughout the year, as do sowing and harvesting. The same can be said about cattle feeding on grass, though the provision of silage and concentrates occurs mainly during the winter. I do not mean that agricultural practices are autonomous from the rhythms of the seasons. For instance the most common rotation of crops in a paddock is as follows:

meadow	→	wheat for forage	→	maize	→	meadow^a
(clover, lotus, alfalfa, <i>festuca</i>)		(or other winter crops like oats or barley)		(or other summer crops like sorghum or <i>moa</i>)		
4 years		6 months		6 months		4 years

^a Oats or wheat might be grown before a new meadow is sown.

Figure 14. Crop rotation in a paddock

An old meadow of leguminous herbs (3-4 years old) would be ‘broken down’ in summer (January-February). Afterwards, a winter crop is grown. It is sown at the beginning of autumn (March-April) to prevent the growth of undesirable weeds [*gramilla*]. Moreover, that winter crop would make efficient use of the stored nitrogen in the soil, fixed by bacteria living in the leguminous herbs. Winter crops have their agricultural value as forage in the form of both winter grazing fields and/or hay reserves. The harvesting and baling of hay take place from September onwards and might last until early January.

After the land is cleaned and tilled, maize or another summer crop is sown between October and December¹³⁶ (end of spring) to be harvested in March-April if a maize silage is to be produced¹³⁷. During the rest of the winter, farmers will start to till the paddock to seed a new meadow. However, if the summer crop has been harvested early enough and the household economy allows it, a new winter crop might be grown. Indeed, a couple of farmers expressed their opinion that more agricultural research was needed to find a stronger type of early maize which would allow them to make more intensive use of their lands. Having said that, most people prefer to plant a new meadow directly after a maize plantation because of the lower inputs required (e.g., of fertilisers and herbicides). Therefore, the paddock's cycle restarts with the preparation of the land to seed a new meadow. Tilling is normally done in the autumn, as soon as the field is cleared of the summer crop. Consequently, the period between March and April is one of the most hectic times of the year, especially if silage has been planned.

¹³⁶ Every seeding period presents an early and later stage. It is a traditional practice among poorer farmers to seed their maize in December, the later stage, when the tilled soil might be drier. In this way, the maize plant has less competition from weeds. Whilst technicians recognise this advantage, most of them would promote the use of chemical herbicides and fertiliser for earlier seeding. Also, in the case of maize, many farmers in the area prefer to sow late to avoid the last frosts of the year that sometimes occur on October. Moreover, people regard soils as 'cold' [*tierras frías*]. Soils need the sun to warm them up in order to achieve the optimum temperature to protect the seed. This latter factor was stressed by a seedsman in an open meeting when presenting a new type of hybrid sorghum which has recently been used as a replacement for maize. He pointed out that farmers should wait to seed until the temperature of the medium layer of the soil is in the region of 15°C. Moreover, he advised the audience to be careful in predicting rain that might reduce the temperature of the earth very quickly and consequently kill the seed. His predicament arose in the course of an argument against an old farmer who expressed his belief in the intimate relation between a particular month of the year and the corresponding agricultural practice. My own observations show, on the contrary, that the practice of most dairy farmers is not guided by the Gregorian calendar, but that they make use of a relatively flexible schedule. The latter is informed not only by ecological aspects, but also by social and economic variables.

¹³⁷ Otherwise, plants will continue their maturation process until dry enough to be harvested in June-July. The grains would be used to prepare home-made foodstuffs, whilst stems and leaves [*chala*] would be given to animals as a source of fibre.

From the above description it can be seen that the diverse crops and pastures local farmers grow in their lands have a particular sequence that follows the rhythm of the seasons. However, as I shall show below, there is nowadays a different resonance between human practices and natural forces, more attuned to particular changes in weather and soil conditions that are not strictly tied to an abstract definition of 'season'. In other words, modern practical agriculture requires that people are alert to more short-term changes in natural forces than the crystallised notion of seasons might represent. I contend that this new relation between work and season is informed by the current tension between local rhythms of work and the more abstract rhythms of the market¹³⁸.

On the other hand, this trend also corresponds to a secularisation of people's attitudes towards natural forces, which has eroded previous cultural expressions of the co-rhythmicity of social and natural temporalities. If we look at the current 'social calendar' in the figure, it would not be easy to match any of the 'holidays' with any particular punctuation of either the agricultural calendar or the passage of the seasons, with the exception of school holidays. I believe that, together with a more homogeneous agricultural calendar, there is a homologous trend towards the homogenisation of social time throughout the year among family dairy farmers, when compared to their past experience as crop-farmers.

Religion, nature and crop-farming

¹³⁸ I am focusing on the dominant working activities on the farms. Had I taken into account other circumstantial activities (e.g. women's temporary work in tourist resorts as described in chapter 3) probably my conclusions regarding the different ways in which seasonality impinges upon women's and men's lives would be different.

One of the most pervasive themes in the depiction of traditional *Canarios* farmers in the national literature has been their historical dependency on the rhythms of natural processes (i.e. seasonality) to obtain their agricultural products. As most authors wrote from a modernising perspective such dependency was considered very negative (Varela 1964; Mourat n.d.: 55; Barrán and Nahum 1973: 253). Moreover, the rhythms of social life, imbued with a strong religious sense, followed the rhythms of the seasons too. The relations between agricultural practices and Catholic beliefs and rituals were apparent until the second half of the 20th century¹³⁹. For instance, the belief that God might provide rainfall at Easter time seemed to be unshakeable. In a narrative of a wedding between *Canarios*, Morosoli (1944) beautifully depicted these relations between God, natural forces and people's livelihoods, as follows:

Drought and the expected rain were in the wedding party, as the new couple was. The former led older men and youngsters to talk.

- Maybe it will rain this afternoon...

Since God is around the world, it has always rained in Easter week.

The bridegroom was the one who needed the water more than anybody else, because he had to break virgin lands which have never received "the iron" before. [...]

Somebody told the bridegroom:

- You will start badly if there isn't rain...

Another person cut into the conversation:

- The most important thing is to be healthy.

- Yet, you still lack the gift of God...

- The gift of God?, asked the bridegroom.

- Water!... and hopefully you will have it soon.

The water was necessary for happiness. Drought and rain regulated happiness.

(Morosoli 1944: 90-1)

¹³⁹ The historical records on this go back to 1799, when, due to a severe drought, the colonial authorities in Montevideo asked the inhabitants of the town to pray for divine help through nine consecutive days of mass in order to bring rainfall (Solari 1958: 246).

According to the historian Zubillaga (1993), the principal mediator between rain and people was the Catholic saint of the peasants, i.e. *San Isidro Labrador*¹⁴⁰. He wrote as follows:

In the time of drought, *Canarios* used to make public worship to *San Isidro*. Preceded by 'novenas' at the farmstead, the farmers went to the fields in a procession carrying the image of the saint and entreating the rain to save the harvest. The simple songs they sang summed up the embodied feelings of expectation among islander migrants: *Patrón San Isidro/Close our cracks/Which because of our guiltiness/We have opened.* (Zubillaga 1993: 38)¹⁴¹

Moreover, according to oral testimonies, *Canarios* used to wait to sow their wheat until *San Isidro Labrador's* day, on the 15th of May. Families in the south-west of Lavalleja travelled to town (e.g., *Solís de Mataojo*) or visited the rural chapels to worship the saint and let their agricultural tools and draught animals be blessed by a priest (Gómez 1970: 15). It was also the day of people's confirmation in the Catholic faith. In Villa del Rosario, a bishop used to come from Minas to celebrate mass at the chapel on that day. The image of the saint was carried by men in a procession. It was a day of feasting and sociality for local communities. Afterwards, it was the time for sowing seeds. The first seeds were commended to *San Isidro*. There was a saying, pondering upon his powers:

San Isidro Labrador does not know how to yoke an ox, but for his just law he can harvest without sowing¹⁴².

Nowadays, these traditional agricultural rituals have disappeared in Villa del Rosario, along with the fields of wheat. The static image of the saint inside the chapel and a

¹⁴⁰ *San Isidro Labrador* [In English: St. Isidore the Husbandman] is the patron saint of Madrid, the capital of Spain (see Thurston and Attwater 1956: 323-4 for an account of the Catholic myth). According to Vidart and Pi Hugarte (1969: 14) the belief in *San Isidro's* miracles and the corresponding rituals originated in the Spanish Catholicism of the counter reformation, brought to Latin America during the colonial era. In Uruguay, since the end of the 19th century, he became the patron saint of a town called Tala in the province of Canelones, which is not far from Villa del Rosario.

¹⁴¹ The song in Spanish: *Patrón San Isidro / Cierra nuestras grietas / que por nuestras culpas / Tenemos abiertas.* (Zubillaga 1993: 38)

¹⁴² In Spanish: *San Isidro Labrador no sabe uncir un buey, pero por su justa ley el cosecha sin sembrar.*

visible cross across the road stand as 'archaeological records' of the former route of the religious procession. Moreover, I was told that in 1987 a group of youngsters suggested the reinstatement of May's procession as a sympathetic performance to revitalise the local economy. Some of them believed that the community had not seen good agricultural yields for a long time, because local people had lost their faith in the saint. In the end, the proposal did not prosper. However, the ritual continues to be performed in some neighbouring towns. Noticeably, during my fieldwork, nobody from Villa del Rosario took part in these ceremonies¹⁴³.

I would suggest that today a more 'secular' conception has replaced previous religious influences on practical agriculture. Of course, local people do have religious beliefs and many of them would appear, from a modern, secularising perspective, to be quite superstitious, but their beliefs seem not to be directly related to the results of production¹⁴⁴. The current formula for success—that combines the 'rational' use of economic and natural resources, human effort, scientific knowledge, and practical skills—seems to have no place for God (and his representatives) in determining a household's livelihood. This secular attitude has evolved in the second half of the twentieth century hand in hand with the introduction of scientific thought in daily

¹⁴³ A group of farmers and I observed a procession on the outskirts of a town, *San Jacinto*, while travelling to a farmers' meeting at a University experimental centre. When I asked my fellow travellers about it, they said: "*It is something from the past*". Some of them had even forgotten the date. The same happened with dairy farmers who met on the day of *San Juan* (12th June) for their monthly meeting. According to the Spanish tradition, people in the household ought to prepare a bonfire on that day (de Humbold 1995: 129). Although I was able to observe dozens of bonfires on my journey to the farm where the meeting took place, most dairy farmers had 'forgotten' to make their own one at home, as they said was common not too long ago. When these adult farmers were teenagers, around 30 years ago, on the day of *San Juan*, they played '*cédulas*', a game to match potential young couples.

¹⁴⁴ According to some of my informants, elder farmers still believe that it is important to sow on waning of the moon [*menguante*]. A young tractor driver was complaining that last year a landlord asked him to wait for such a time to seed a meadow, which had meant a delay on his payment.

practices, through formal education and the rural extensionism carried on by an army of traders, technicians and mass-media presenters. People might allocate their time to meetings where farm management is debated, rather than participating in religious events which have lost their symbolic efficiency, and also appeal for the development of the social fabric. As a farmer commented on the decline of religious activity in the zone:

One thing kills the other. People are more committed to farmers' meetings to find out ways to develop our farms. These meetings did not exist a couple of years ago.

In the midst of a severe economic crisis, the individual farmer (and his/her family) has definitely become the main element responsible for success or failure. I would suggest that it is in this context that the rise of new senses of commodified time should be understood, i.e. time as an entity to be used, managed, consumed, saved and so on. Before I develop this idea, however, I shall explore the current relations between working practices and the meaning of the weather.

Production and weather conditions

Local people acknowledge that in the recent past the rhythmic structures of work were radically different from current ones. For instance, an elderly inhabitant pointed out:

In the past we grew wheat and a few other things. Maybe there was more time. You had not got a party every Saturday as you might have today. However, people used to visit their extended families, or otherwise your relatives might come to your place to stay a couple of days after the threshing of wheat. On the other hand, nowadays in the country, you have always something different to do, every day, every day. To feed a calf, to milk a cow... Time can be less wasted. In the past, you seeded wheat and then you waited. Many youngsters even went hunting and nothing was delayed. Now, every day, there is something else to do.

This testimony highlights the changing rhythms of work that followed the shift from crop farming to mixed livestock production. Extensive agriculture was a working process that required intensive human labour in short periods during the year, whereas livestock herding needs daily, constant human attendance, especially in dairy farming, as I have already shown. This has meant not only a different temporality in the sense of more routine rhythms of work, but also a different relation between human practices and weather conditions. Indeed, if it is true that in the past there was a relatively fixed calendar for certain agricultural activities, today there is a trend towards a more flexible, task-oriented time performance, which involves a more complex set of practices and a more attentive perceptual tuning to natural events.

The Spanish word *tiempo*, translated into English as 'time', is used in two main linguistic contexts. It can be used to refer to the temporal dimension or duration of an event, as for example in the question *¿Cuánto tiempo te llevó el viaje?* [How long did your trip take?] The second usage is linked to the state of the weather, as in the question: *¿Cómo está el tiempo?* [What is the weather like?] Probably there was a traditional association between the two, when time-measure was closer to the perception of weather events. The quality of time was more important than its quantity. Moreover, the original Latin word for time, *Tempus*, is the root for the Spanish words *Temporal*—which means short duration but also a storm, and *Tempestad*, which also means a storm, a tempest or a squall (Mateos 1969). Nowadays, local farmers distinguish conceptually between the two meanings and, moreover, use different means to represent and objectify them. Time is measured by the clock and calendars, while the weather appears objectified in the form of the climatic indicator shown everyday on radio and TV weather forecasts. Having said that, it seems to me that duration and

weather are still experienced as two levels of the same phenomenon. Moreover, perception of local weather events continues to be a basic skill required for farming¹⁴⁵.

As an agronomist pointed out:

All rural producers, particularly crop-farmers and dairy farmers, are weather predictors. They spend their life predicting it. Attention to the winds and the official weather report are their tools.

This important fact of being weather forecasters is manifested in countless sayings in rural areas, which might also reflect the resonance of living organisms to the physical components of the environment. I shall mention just a few of those I heard during my fieldwork: 'If the *teru-teru* [*Vanellus chilensis*] nest in the lowlands, it won't rain'; 'If springtime comes earlier, the *teru-teru* nest earlier, too'; 'If the sun goes down beyond the clouds on Thursday, it will rain'; 'If the winds are blowing from east-northeast, in three days it will rain'. I would suggest that both meanings of time are still melded together in people's current experience, due to particular features associated with so-called global climatic change, and more importantly, to the intensification of agricultural work.

Most people regard the 'past' as the time when farmers had the possibility of carrying on with agricultural practices in more fixed and known periods, whilst the present is described as the more chaotic and hazardous emergence of good days to work. As some farmers stated: '*In the past, you had fifteen days for seeding, but now all the work must be done in only three days*'; or '*In the past, I dominated the weather. Now, it dominates me*'. It is important to note that my fieldwork coincided with a period of exceptional

¹⁴⁵ The importance of external climatic information has increased in people's lives. Many farmers even pointed out that they were not able to predict the weather conditions any more. In a farmer's words: '*Now we have to listen to the weather report while in the past it was enough to observe our surroundings*' (See Huber and Pederson 1997, for an analogous case in Tibet.)

rainfall, especially during springtime and the beginning of the summer. The northern part of the country suffered severe floods, while in the south, the effects were not so marked. Indeed, for livestock producers in the area under study, the rain was at first very welcome because it meant fresh pastures for their cattle, though the rainfall was followed by a period of drought, and afterwards too much rain again, which ended up delaying the work on the land to grow winter crops. Despite people's perception of 'radical' changes in the local weather¹⁴⁶, meteorologists have shown that, according to historical statistics, this was not the case at the national level, though scientists recognise a slight increase in rainfall during summertime over the last thirty years¹⁴⁷. In fact, the Uruguayan weather has been defined as unpredictable by many observers, at least since the 19th century, long before the theme of global climate change arose in the debate among experts and the public. For instance, in 1871, a British priest pointed out:

It is stated by old captains of ships that no one can prognosticate or foresee what the weather would be in this country. Moreover, even for a person who is accustomed to think of himself as weather-wise, the rapidity of storm formation is surprising; the latter comes without giving any indication of its approach. (Murray 1871: 143)

Moreover, one of the most reputed agronomists in the country stated in 1928:

In this country, the influence of the climate over agricultural yields overwhelms the soil factor, universally determinant. When the weather 'accompanies' the crops, good harvests are obtained even in poor, tired and badly tilled soils. On the contrary, the most promising harvests might be lost at the last minute due to one of those unpleasant surprises that characterises the River Plate meteorology, mainly rapid changes of temperature. (Boerger 1928 :21)

He added,

¹⁴⁶ An old farmer was very sure to point out when the 'global change' would have started. He said: *'In the late 1960s there was a very strong frost. I got down from the tractor because I couldn't feel my body. I was just mind. And there was no way to warm up. It was an impressive frost. Since then, the seasons have changed. Nowadays, planning should be made according to the worst possible option'*.

¹⁴⁷ Mario Bidegain, *Dirección Nacional de Metereología*, personal communication.

[For Uruguay], the abnormal is the normal! [...] Climate is the worst enemy of the River Plate's farmers. (ibid.: 24)

I do not deny that exceptional climate changes have been identified both by scientists and lay people (e.g., the effects of the thinning of the ozone layer). Moreover, rural producers have experienced unprecedented changes in their crops, fields and bodies, that they associate with climate changes (e.g., severe burning of crops and of people's own skin). However, I believe that changes in the systems of production among rural producers in general, and among dairy farmers in particular, have enhanced the notion of the weather as a constraint simultaneously with the need, and more often than not the failure to continuously increase the productivity of both their land and their cattle. Therefore, seasonality—which is qualitatively rather than quantitatively perceived—is contrasted with the commodity-time embodied in capitalist agriculture.

I argue, then, that the increasing diversity and intensity of activities on the farms might be associated with the perception of time as more pressing, and of the weather as more harsh. According to Ferrari and Lazaro (1990), the technological package promoted by the Co-op's technicians works against some basic features of natural cycles. They pointed out that dairy farmers are forced to work the land and herd their cattle on the meadows over periods that should be avoided because of the level of dampness in the ground after rain. According to these authors, these practices might lead to an increasing risk of soil depletion that might threaten future land uses (Ferrari and Lazaro 1990: 23). Moreover, they argue that the current application of the technological package (described in chapter 3), indiscriminately in both smallholdings and large farms, has not benefited smallholders, who are unable to buy the inputs required to sustain the fertility and productivity of their lands. My point is that dairy farmers are

racing to gain time (hours) from time (weather) by using more 'efficient' tools (social and material) according to their emerging needs, in the race to increase productivity. Furthermore, as in other historical examples, the intensification of agriculture might lead farmers to describe their lives as characterised by hurry (e.g., German peasants at the beginning of the 19th century, see Guyer 1988: 255).

Coping with the rhythms of the market

In practice, the resolution of the tension between seasonality and market rhythms has acquired an individual and technical rather than a collective form. The purchase of machinery and agricultural inputs is seen as the best (if not the only) way to cope with such an intrinsic, though nowadays reinforced, contradiction in capitalist agriculture (Adam 1998: 140-1). As a young dairy farmer put it:

By using my tractor I control time. Nowadays, you cannot wait. Things must be resolved faster.

I would suggest that modern dairy farmers are biased towards a kind of technological determinism, in the sense that technological innovations and inputs have become the only means to achieve 'efficiency' (measured by monetary income), reinforcing the idea that the tension between temporalities is external to social relations. Certainly, family farmers are aware of the social mediation in the constitution of temporalities, but such tension can be more reliably coped with than otherwise on an individual basis and at the level of the individual farm. For instance, the first dairy farmers' work-team in Villa del Rosario got together to buy a tractor and agricultural equipment for baling. Although there were informal agreements on the order of their use according to individual needs, the fact that more than one farm needed to have a job done simultaneously created the

dilemma of missing the 'right time' to do it properly. Moreover, the continuous use of the equipment not only on members' farms, but also in the course of contracted agricultural services inside and outside of the locality, meant more frequent and serious mechanical faults. Consequently, machines were not ready for use when needed. This led to the parallel individual purchase of machinery, which has resulted in social differentiation between group members. Those who were able to pay for a new tractor or equipment found themselves in a better position to fill the gap between seasonality and practical agriculture, and consequently to adapt to the rhythms of the market.

On the other hand, the relation between individual farmers and agricultural service providers—which represents another source of access to the means of production—did not always solve the conflict between seasonality and commodity-time. The owner of the machinery generally had a busy schedule during peak periods, and it was not uncommon that the final result of his job was poorer than expected, due to delay in arriving at the farm. Moreover, the contracted farmer was also constrained by weather conditions in carrying on his job, which went against his purpose of doing as much work as possible in the shortest period to gain an advantage over competitors. Therefore, individual acquisition and use of agricultural machinery was increasingly seen as the best way to cope with the tension between the natural rhythms of the seasons and production requirements.

The above issues are intimately related to the generalised use of rural credits. The repayment of loans might last a few months, as for example in the case of paying for agricultural inputs at the Co-op shop, or for three years in order to pay for a dairy cow, or for even longer, maybe ten years, in order to buy a piece of land. In every formal

meeting I attended with family dairy farmers in Villa del Rosario, issues surrounding the conditions, risks, and procedures involved in obtaining a new loan were discussed. According to testimonies and the analysis of the year of purchase of working tools and land on most of the farms I surveyed, rural credits were more accessible and more easily paid until the mid 1990s. Consequently, the strong tension between financial obligations and practical results on the farms is relatively recent. Family dairy farmers constantly worry about becoming more indebted, though they have no other alternative but to continue to seek opportunities in both the public and private banking sector, generally through the Co-op's mediation. Obviously, the generalised use of credits means that local people conceive of a viable future. Moreover, this future can be, and is, planned. We are, then, in the presence of a very abstract notion of time, detached from the more immediate sense of 'forthcoming' proper to concrete phenomenological activity (Bourdieu 1966; Lukács 1980).

In this regard, the role of technicians has been fundamental in mediating between task-oriented time and commodity-time. With rare exceptions, dairy farmers themselves are unable to present a production project in such a way that it is accepted by the controlling bodies. Moreover, the continuous change in the quality, characteristics and potential consequences of agricultural inputs, as well as their costs, make the technician, who has better access to these kinds of information, a basic 'social tool' (Bates 1979) for modern farmers. Hence, those who have managed to build a longstanding relation with technicians are in a better position to cope with the clash of temporalities. The following testimony, from one of the rural extensionists who has worked with family dairy farmers since the beginning of the productive reconversion process, seems to highlight this point,

As long as a producer introduces modern technologies, he seems to be more dependent on the technicians. I hope we [the technicians] are not guilty of that, but it is real. The thing is that the production of milk is increasingly aggressive, more competitive... If in the past you produced 1,000 litres of milk per hectare, nowadays you must produce 2,000 litres and it is still not enough; hence, you start already to think of producing 4,000 litres and next year 4,500, and so on. It is a race against the decrease of prices in the international market. Countries like ours are obliged to run in this race in order to catch those prices that we don't influence. It is the only way to keep the enterprises functioning.

Another way to deal with the tension between socio/seasonal time and market time is to be involved in the micro-politics of the Co-op, expecting some extra help to cope with the need for money. As I was informed by a farmer:

I often travel to the headquarters of the National Milk Producers' Association in Montevideo. I go there looking for money. I worked [sic] for the current management during the last elections, so I approach them to receive my share.

Unlike the most common 'technical' answers to the tension between commodity and socio/seasonal time, here the problem seems to be firmly situated in the domain of social relations.

Conclusion

To conclude, at the turn of the 21st century it is common to find that most urban dwellers in Uruguay (and probably in the rest of the world) do think of farmers and rural workers as people without watches, who do not feel any stress or 'hunger for time', in contrast to their own urban style of living and experienced temporality. Moreover, there are many rural producers, sometimes influenced by modern environmental discourse, who claim that their lives are closer to Nature's rhythms than those of their fellow urban citizens. Whereas, in the recent past, these attitudes of

Canarios farmers towards time were regarded as 'primitive' and/or 'backward', nowadays they are seen to some extent as an advantage. My analysis has shown, however, the reality is not black or white. I argue that the perception of environmental events, the attitudes towards time and the conscious representation of temporalities among modern dairy farmers in Villa del Rosario is informed by the tension between the rhythms of task-oriented time and the dominant ideology of commodity-time or clock-time. The former is the temporality embedded in the sequence of practical productive activities and the social arrangements between people at the local level, while the latter is a conception of abstract time, alien to the evolution of social life in particular environments. Task-oriented time is experienced as an integral part of the growing of plants, animals, people and their mutual relations, whereas clock-time is likened to a commodity that should be saved and consumed. The *Canarios*' dominant way of coping with the tension between these two current senses of time is centred mainly on the purchase and use of new productive technologies, and to a lesser extent, on the development of personal relations with particular persons or organisations that seem to have more control over commodity-time, i.e. technicians and directors of farmers' organisations.

My conclusions, in principle, follow Ingold's suggestion that

[...] task orientation, with its attendant socially situated skills and prestations, is the primary condition of our being at home in the world. As such, it constitutes the baseline of sociality upon which the order of modernity has been built, and from which we have now to come to terms with it. (1995 :21)

Moreover, he added,

[W]e are human beings whose lives are caught up in the painful process of negotiation between these extremes, between the dwelling and commodity perspectives. In this process lies the temporal dynamic of industrial society. (ibid.: 27)

However, the idea of coping or negotiation does not mean resolving the tension in harmony. On the contrary, most local farmers fail to achieve this perhaps unattainable goal within the current socio-economic context. This is why 'time' has become increasingly conceived of as something to be faced or struggled against. Moreover, this struggle is conducted by individual families, or even single members of families, rather than collectively. This household 'strategy' could reinforce the ideological conception of time as estranged from the flow of social relations or in other words, the alienation of time. Having said that, my ethnography has shown that the concept of alienated time among local people coexists with a perception and conception of time constituted by the relation between persons, between persons and other living beings, and between persons and physical forces. In this sense, time is a relational phenomenon rather than an object or entity. This might be the reason for the difficulty, clearly expressed by Saint Augustine in the quotation that heads this chapter, of talking about time in itself without anchoring our perceptions of it in ecological events and their multiple relational fields (Gibson 1986: 101). The case of *Canarios* farmers highlights the point that an anthropological study of human attitudes towards time in industrial, and probably in industrialising societies, should not be concerned with the discovery of a unique sense of time among the peoples studied. Rather it ought to be attentive to the movement of different constituents of the environment and the resulting complex interweaving of different temporalities, together with the social struggle to keep under personal and perhaps collective control the resolution of tensions arising between task-oriented and the clock-oriented perspectives of time.



Plate 20. Dairy farmers celebrating their annual feast at the river.



Plate 21. Milk churns waiting to be collected.



Plate 22. Lorry driver collecting bulk milk



Plate 23. Peregrination to Verdún.

Plate 24. Primary school of Villa del Rosario



Plate 25. Men with



tractor and cart.

Chapter 6. Milking: the interfaces between labour, machines and animals

General Introduction

The aim of this chapter is to analyse the nature of *Canarios* dairy farmers' relations with machines and animals. It draws particular attention to the interfaces between milking machines, lactating cows and milkers during the milking routine. Of course, in a typical working day, people use several modern artefacts as means of production: tractors to till the land or carry goods, electric mills to produce animal feed, water pumps to bring water to the house and parlour, cookers to boil water, and so forth. On the other hand, people's interactions with their dairy herd take place in the paddocks while animals are grazing, or near 'the houses' if a sanitary treatment is being conducted, or even on the road if animals must be driven to other plots. Yet during my fieldwork, the twice daily milking emerged as the most salient 'activity system' for analysing recent changes in the perception of the natural and social environment, and, simultaneously, the unfolding of people's subjectivity in relation to the use of modern techniques and technologies. Here, I follow Pfaffenberger (1992) in his definition of an activity system as 'a domain of purposive, goal-oriented action in which knowledge and behavior are reciprocally constituted by social, individual, and material phenomena' (1992: 508; see also Keller and Keller 1993: 127). Drawing upon my ethnography of the working practices carried out by farmers within the milking parlour, I attempt to answer the following question: does the use of milking machines lead to the alienation of people from both their skills and the object of their labour?

In the current debate on the relations between society and nature, many contributors have attributed the global ecological crisis to the uncontrolled development and use of technology for the transformation of natural resources to satisfy human needs. Indeed, it is commonly claimed that modern artefacts embody an instrumentalist-rationalist perspective on nature, which leads to the estrangement of people from the rhythms of the natural world (O’Riordan and Turner 1983; Brey 1999). This idea of estrangement from the natural world has two sides. On the one hand, there is a view of the increasing alienation of people from their inner nature and natural capabilities and skills to engage creatively with the material world, leading to the ‘degradation of labour’ (Braverman 1974)¹⁴⁸. On the other hand, the supposed loss of human skills might correspond to the practical estrangement of workers from the non-human components of the environment, or ‘external’ nature. The use of modern machinery in industrial societies is often regarded as the final stage of such processes of alienation from both internal and external nature.

In this chapter, I shall demonstrate that mechanical milking is not in itself an alienating process of labour. We have rather to understand the ambiguities of this technology in its social context of production and use. The chapter is divided into two parts. In the first part, I focus on how people conduct the milking routine, the particularities of mechanical milking and the effects on the enskillment of milkers, particularly in the

¹⁴⁸ Gaskel (1968), whose work stands as a clear precursor to the Western debate on human deskilling due to the mechanisation of production, wrote in the 1830s:

It is the great aim of machinery to make skill or strength on the part of the workman valueless, and to reduce him to a mere watcher of, and waiter upon, *automata*. The term artisan will shortly be a misnomer as applied to the operative; he will no longer be a man proud of his skill and ingenuity, and conscious that he is a valuable member of society; he will have lost all free agency, and will be as much a part of the machines around him as the wheels or cranks which communicate motion. (1968: 357-8)

changing richness of their sensory capabilities or the tuning of the senses to the working environment. I argue that the use of modern machines does not necessarily displace human subjects from the centre of the process of labour and, as a corollary, that mechanical milking is informed by a 'workmanship of risk' (Pye 1995). The latter entails the unfolding of a synergy between the person and constituents of the environment far removed from the idea of technical alienation.

In the second part, moving on from the description of the milking routine, I further analyse human-animal relations in modern dairying. I begin by presenting the case of modern family dairy farming in southern Uruguay in the context of the anthropological debate on the domestication of animals, showing the tension between the principles of trust and domination underlying dairy farmers' current attitudes towards cows. Then, I move on to explore the homology between human-animal and human-human relations, arguing for a more integrated view of the ecological and social domains as synergistically connected parts of the same reality. Finally, I study the relations between people's practical engagement *with* milk cows and their discourses *of* milk cows. Contrary to commonly held ideas about the increasing estrangement between farmers and animals under capitalist conditions of animal herding, I contend that local farmers' concern with animals is still in place and involves an attentive engagement between people and dairy cattle. However, I shall argue that modern dairying, guided by the logic of capital, may lead to a reified way of dominating animals expressed in, and influenced by, trends in the milking and cattle management systems locally adopted by

For a more recent critique of such a one-sided perspective on the effects of industrial machines upon human skills and subjectivity, see the inspiring compilation by Zimbalist (1979); also, MacKenzie (1984).

farmers. Moreover, the reification of dairy cattle corresponds to a seemingly analogous development in the social relations of production among people.

Part 1. The effects of mechanical milking in the unfolding of perceptual skills

Instead of liberation *from* work being the chief contribution of mechanisation and automation, I would suggest that liberation *for* work—for educative, mind-forming work, self-rewarding even on the lowest physiological level—may become the most salutary contribution of a life-centered technology. (Mumford 1966: 316)

A brief history of mechanical milking in Uruguay

The very first attempts to assemble a machine to milk cows took place in England in the 1830s (Jansson 1973; Fussell 1966; Dittman 1999). Inventors, most of them farmers themselves, sought to make milking operations easier and, if possible, though not necessarily, to reduce the number of milkers on the farms. However, despite many trials, it was not until after the Second World War that the operation of milking machines was regarded as more efficient than hand milking. By that time, mechanical milking had helped to 'improve' and indeed to change the quality of milk sent to dairy plants (Dittman 1999: 271). Secondly, the replacement of machines for milkers became both an effect and cause of the migration of skilled milkers out of rural areas (Barnard, Halley and Scott 1970: 96). Thirdly, new designs and mass production made milking machines affordable and more suited to family farms with medium and small herds, which represented the majority in north west Europe, North America and Australasia¹⁴⁹, to mention those areas of the world where modern dairying had its earliest development. According to Jansson (1973), the research on, and improvements in, the functioning and components of machines were greatly encouraged after 1941, when the scientific discovery of the theoretical principles underlying the physiology of the 'let-

¹⁴⁹ For instance, in New Zealand, the first milking machines were installed around 1910 and by the 1930s the redundancy of human labour, especially of milkmaids, on dairy farms was notorious (Lloyd Pritchard 1970: 278-9).

down' and 'hold up' of milk in cows occurred¹⁵⁰. Since then, the production of milking machines has been guided by the goal of limiting constraints of both the cow's biology and the traditional habits of milkers, in order to enable a relatively fast and clean milking operation that, in turn, would not damage the teats and udder of the animal¹⁵¹. For instance, among other things, the vacuum principle (originally imitating a calf's suckling) was confirmed as the most efficient technology of milking over the alternative pressure principle system (originally imitating human manual milking). The latter was nevertheless already in retreat, based on empirical results, even before the scientific study of suckling (Jansson 1973: 7; Hall 1977: 5)¹⁵².

Taking into account the international history of machine milking, it should be noted that the introduction of milking machines on Uruguayan farms was late, not occurring until the 1970s. Nevertheless, advertisements can already be found in magazines promoting the use of milking machines in the early 1930s (El Granjero Moderno 1931)¹⁵³. Besides

¹⁵⁰ The research was conducted by a team of scholars led by W.E. Peterson from the University of Minnesota in the USA (Hall 1977). It seems to be a clear example of the involvement of science as a fundamental component of the forces of production in modern societies.

¹⁵¹ During the 1960s, hand milking represented on average 126 hrs/cow/year while mechanical milking reduced the timing to less than one fourth of that average, i.e. 30 hrs/cow/year (Barnard, Halley and Scott 1970: 105).

¹⁵² According to Cowie (1977), a calf's or child's suckling does not really differ in its governing principles from the process of hand milking. They are analogous processes 'in that the milk in the teat cistern is trapped there by compression of the base of the teat and then forced out through the teat canal by positive pressure on the teat' (1977: 117). Consequently, the vacuum system of a milking machine would indeed be another way to exercise pressure on the teat, not essentially distinct from hand milking.

¹⁵³ Significantly, milking machines were not advertised as means to produce less polluted milk, but rather as labour saving devices. For instance, one of the advertisements showed that, according to research done by the Swedish company Alfa-Laval, '...one person with four [mobile] milking machines does a superior job in the same time to five people milking manually' (El Granjero Moderno 1931: 34). The emphasis on the relations between milking machines and labour saving was not exceptional, as can be seen in a 1916 English advertisement with the following title: 'Labour Question Solved, Farmers Economise'. The advertisement offered the benefits of a cannulae 'machine', the so-called 'Moreton Automatic Milker', which would have milked '10 cows in one hour' (Hall 1977: 2). It is worth noting that, by the end of the 19th century, according to Fussell (1966), a skilled milkmaid would milk between 6 to 8 cows per hour. Therefore, machines were not radically faster than skilled milkers.

farmers' distrust of the efficiency of available machines in the market—as an old machine installer told me—the persistence of hand milking was probably also the consequence of the low costs of labour, together with the relatively low degree of hygiene required by the dairy industry and urban consumers (Barrán and Nahum 1977: 138-9). Furthermore, during the first expansion of the dairy sector in the country (1940-60), mechanical milking was still exceptional (CINVE 1987)¹⁵⁴.

However, since the 1970s, among other changes in the way milk has been produced on the farms, first, milking machines, and later, bulk tanks were introduced. According to a young but experienced machine installer, it was during the 1970s that private tradesmen, who used to sell frozen semen for artificial insemination, encouraged traditional dairy farmers to install milking machines and cooling systems. Although traders were mostly interested in selling bulls' semen, they realised that artificial insemination was just a small part of a larger technological package in modern dairying and began to promote and sell other 'improvements' as a way to increase their own profits. Nevertheless, it was the second expansion of dairy farming at the end of the 1980s, guided by *Conaprole's* export oriented strategy, that has provided the context for the rapid shift towards mechanical milking and bulk storage on dairy farms. The Co-op's aim has been to 'grant a better quality of raw material arriving at the Co-op's dairies' (CINVE 1987: 55). The effects were twofold. On the one hand, farmers bought and installed milking machinery, using the financial support provided by the Co-op.

¹⁵⁴ The replacement of human labour by machines seemed to happen from the late 1960s. As a machine installer told me: *'Every time I installed a milking machine, a crew of unemployed people followed me on my way out'*. Moreover, in 1972, the trades union that had formerly represented waged milkers (*Sindicato Unico de Peones de Tambo, SUPT*) demanded that the state create a new category of workers in dairy farming—namely, machine milkers [*ordeñador con máquina*], and a 50% rise in milkers' wages (González 1994: 139). It seems clear that the use of milking machines increased labour productivity per worker. Therefore, many waged and non-

Consequently, whilst in 1980 there were around 2,000 milking machines installed (CINVE 1987: 56), ten years later their number had almost doubled, despite the decrease in the total number of dairy farms (Dirección de Censos y Encuestas 1994: 216). On the other hand, the market for milking machines and associated services expanded¹⁵⁵.

My own survey in Villa del Rosario confirms that the introduction of milking machinery is associated with the farm's membership of the main Dairy Co-operative¹⁵⁶.

The decision to mechanise milking operations was taken by family dairy farmers as they became fully integrated into the dairy agribusiness. Their attitude was characterised by a mixture of self-determination and a need to submit to unavoidable change. External forces leading to higher human and animal productivity, new established norms for the quality of milk produced on the farm and financial facilities provided by official institutions were combined with a positive evaluation of the future of dairy farming for the livelihood of the household. This has not been a sudden decision at household level, but a process. Indeed it very often happened that milking machines were purchased but not immediately installed. Their installation was associated with changes such as the increase in the size of dairy herds, the connection to the public electricity network, the

waged milkers might have been redundant. This was suggested in the literature of the 1980s, though there is no systematic data available (Astori et al. 1983: 98; CINVE 1987: 122-3).

¹⁵⁵ Nowadays, there are more than ten different brands of milking machines available on the market, from the most sophisticated ones (worth US\$ 50,000) to simpler ones, locally assembled (worth around US\$ 5,000). A list of available milking machines includes, among others, the following: Surge and Zero (USA), Westphalia (Germany), Alfa-Laval and Stranco (Sweden), Bossio (Argentina), Ruakura (New Zealand with some pieces made in Uruguay), Euromil and Latinmil (assembled in Uruguay). The installation, and sometimes the maintenance, of new milking machines on the farms are normally included in the selling price. The purchase of second-hand machines is common and farmers do install them on their own, though they might call an expert for guidance and co-operation.

¹⁵⁶ A couple of surveyed dairy farms which had milking machines but did not send their milk to the Co-op plant were former Co-op members or were considered to be potential members in the near future.

building of a new milking parlour and the engagement of women in the milking routine¹⁵⁷.

To sum up, when milking machines were introduced on Villa del Rosario's family farms in the late 1980s, local farmers did not regard them as unknown artefacts. On the contrary, the use of milking machinery would have already been partially evaluated in terms of its technical and social advantages (and disadvantages) in the eyes of small and medium dairy farmers. Indeed, the introduction of milking machinery has been another instance of the trend towards the replacement of human labour by machines in agriculture in the context of capitalism (see Linck 1985: 150). Having said that, the cultural meanings of these machines and the working environment they become part of would become apparent among local people only through their working with them. As Costall points out: 'The meanings of things are revealed and realized within activity' (1997: 77), or as Suchman suggests, objects 'are boundary projects [that] can be assessed only in their relations to the sites of their use' (1994: 34). I shall turn therefore to a description of the use of milking machinery within the context of the milking routine among family dairy farmers in Villa del Rosario. In doing this, I shall, where pertinent, note the differences between family and non-family *tambos*.

¹⁵⁷ The current participation of women in milking routines has in a few cases been an important factor in mechanisation, due to their refusal to engage in 'industrial-scale' milking without, at least, a milking machine.

Driving cows and organising the milking room

The daily milking routine (*rutina de ordeño*) on a typical family dairy farm starts early in the morning (between 6 and 8 am) when the milk cows are driven from the fields to the *tambo*. This operation might take from twenty to forty minutes, depending on which paddock the cows spent the night in and the ground conditions, since cows move more slowly in muddy terrain. Children and youngsters drive the herd, if they do not have to go to school. Otherwise, men are generally in charge. A single child or adult is able to drive a herd of tame milk cows simply by shouting or gesturing with their arms. Needless to say, horses and dogs are widely used to help people drive their cattle.

While driving the cows, a farmer might notice if there is any change in the condition of the cattle from the day before by looking at how they graze, how they walk, or any unusual behaviour. For example, one cow mounting another might be a sign of zeal in the mounted cow.

Meanwhile, a second person would be organising the milking room. The milking machine is rinsed to wash out the remaining hyperchlorine solution left during the previous milking shift. The bulk tank might also be rinsed if necessary. The bulk tank's colander is fixed to the incoming hole (see figures 15 and 16 for a schematic depiction of a milking machine and bulk tank respectively). The former is made of a piece of cloth or special filter paper. Heavy sacks of concentrates are normally brought from a

¹⁵⁸ This description follows, unless otherwise stated, my observations of the milking routine in family *tambos* using the predominant two stalls/unit abreast milking system (See chapter 4).

nearby barn and then feeding troughs are filled up using a small container as a measure. Salts may be added to the feed, too. Concentrates are always put in the manger before a cow enters the milking room. The quantity of the given ration depends in small *tambos* on the milkers' assessment of the feeding needs of a particular animal.

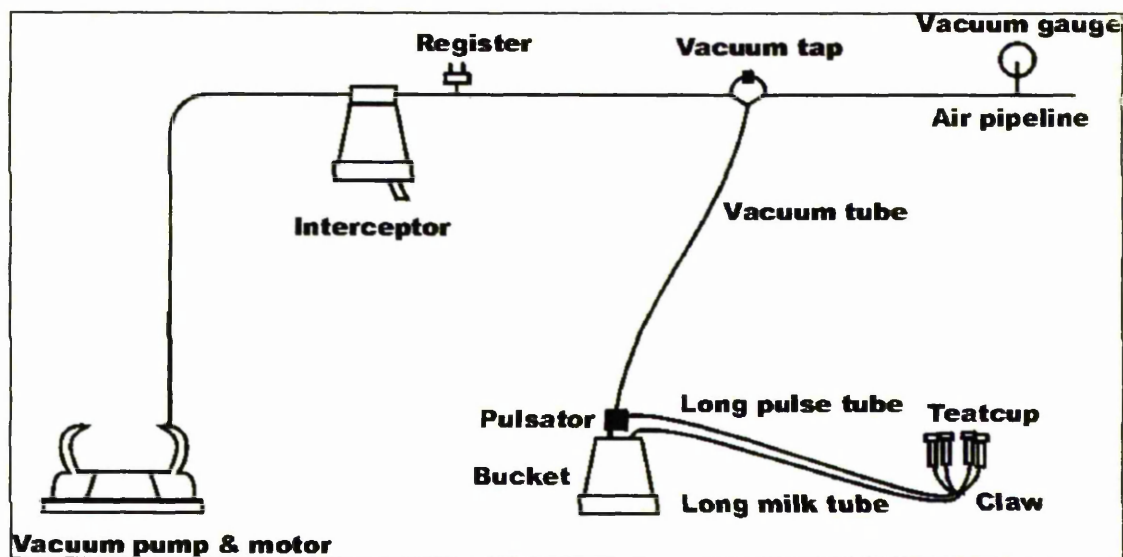


Figure 15. A schematic layout of direct to churn or bucket milking machine.
Source: Akam (1977).

Also, the level of oil in the milking machine engine is checked, and the water pump might be turned on if the water tank has been emptied. A clean empty milk churn is placed near each milking cluster and a lid with a gasket is put over each churn, which will become sealed when the vacuum system is turned on.

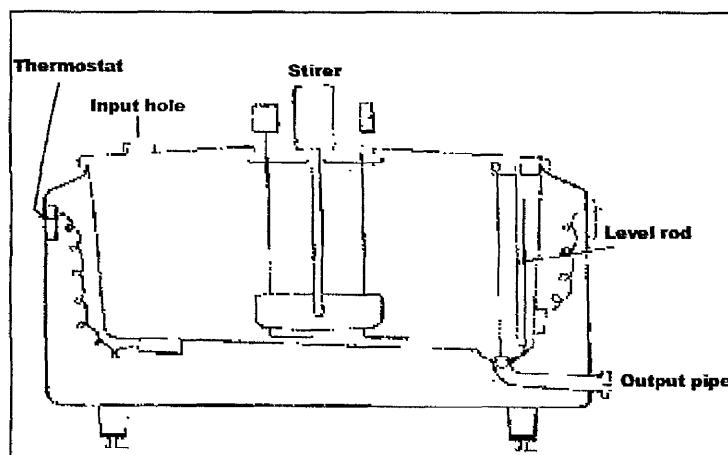


Figure 16. A schematic layout of a farm bulk tank.
 Source: Facultad de Veterinaria (1997).

Once the cows arrive at the *tambo*, they stand in the waiting area where drinking water is provided in pools or tanks. The arriving milker enters into the milking room after closing the gate of the waiting area. He puts on a plastic apron and helps his fellow milker to check if basic things are ready to start milking. He may turn on the radio to listen to the news or favourite music. Then, the first two cows are brought into the milking room.

Bringing cows into the milking room

The first cows are driven into the milking room before the engine of the milking machine is turned on. To bring a cow into a stall is easier when cows are 'trained'. Indeed, animals show a particular 'willingness' to be milked¹⁵⁹.

¹⁵⁹ According to farmers, the co-operation of a cow is based on its knowledge that the sense of 'discomfort' that comes from having a heavy udder full of milk will be relieved through milking. Moreover, they stated that giving concentrates works as a 'reward' for their collaboration. During my visit to a large *tambo* with 200 lactating cows, it happened that there were no concentrates for three consecutive days. Milkers had a tough time bringing the cows into the milking room and animals remained unsettled in front of their empty mangers throughout the milking process.

The cows enter the milking room in a relatively fixed order. Should this order be changed, people might try to take out the 'wrong' cow and let the correct one enter in its place. Sometimes, it is sufficient to whistle from inside the milking room or to call a cow's name in order to bring it into the milking room. However, it is often necessary for a person to go out to the waiting area and drive selected cows through the entrance. Moreover, although normally the cow will walk straightaway to the preferred stall it is not uncommon to place an obstacle (for example, the second milker) in its way in order to obstruct its passage to a different one.

After a cow has been driven into the stall, a chain is passed behind it. The purpose is to prevent it from walking back as well as to keep its tail relatively steady. Then, in most cases, milkers hobble the back legs of the cow¹⁶⁰. People may use special metal hobbles, or alternatively strings made of nylon or braided hide with a ring in one end to make a 'milker's knot'. I realised that children, when present at the time of milking to help or just to observe, were asked to hide or look for shelter in the milking room while cows move in and out. The reason for this may be the risk of being hit by an animal. The interaction between cows and people in the milking parlour involves a higher risk of a person being injured than exists in other places on the farm. Indeed, being kicked by a cow seemed to be a frequent event and milkers always had a tragic story to tell you as a warning to keep your head as far as possible from the animal whilst hobbling its legs.

Once a cow has been brought to the proper stall, its teats are washed with water using the hoses that hang from the upper water pipes. Using his free hand, a milker drains off water from the teats and removes any piece of mud that may remain attached to them (see plate 27). Sometimes, a piece of cloth is used to dry out the teats¹⁶¹. Then, the milker manually takes a first spout of milk to ensure there is no dirt inside the nipples. Farmers might also milk a second spout in a foremilk cup to check for signs of mastitis¹⁶².

The attachment of milking clusters

Once the teats of the first cows have been washed, it is time to turn on the engine that gives power to the vacuum pump. At first it is very noisy, but it rapidly becomes a continuous background to the rhythmic vibrations of the vacuum pulsator. The milker watches the vacuum gauge (known as a *reloj* [clock]) to check the level of the vacuum. If this is normal, the milking cluster is attached to the teats of the cow. Otherwise, the vacuum regulator on the vacuum pump should be adjusted.

The milking cluster is then taken from a hook between the stalls. The milker opens a pinch clip or vacuum tap to allow a vacuum to operate on the so-called long milk tube, which connects a cluster to the receiving milk churn. With the inverted cluster in one of his hands, the milker looks for the best body position on the free side of the cow from

¹⁶⁰ In many cases, cows are not hobbled. This depends on the confidence of the milker based on his relation with the cow. In more sophisticated milking rooms where a metal fence is installed between the animals and the milkers, and the latter stand in a trench, hobbling is rarely performed. Yet, it is required when a new heifer dislikes the milking cluster and kicks it off.

¹⁶¹ Technicians recommend the use of a disposable paper towel for each cow (Facultad de Veterinaria 1997: 84). However, small dairy farmers would not spend money on this. According to recent studies on the spread of udder diseases during milking, it is better to leave the teats wet than to try to dry using non-disposable towels (Edmondson 2000).

¹⁶² This is a regular operation on large dairy farms, though not always carried out on small ones.

which to see the teats and manipulate the teatcups. It is common to be in a squatting position, though some people stand up and flex their waist. A few older milkers sit on a small stool.

The attachment of the cluster requires some strength in the supporting hand to keep the claw (*araña*) in the air while the 'right' hand attaches each teatcup, guiding the teat into the cup with the fingers. The working of the vacuum facilitates the adjustment of the tool. The sequence is repeated for each teat from the back to the front teats¹⁶³. I found that quite often milkers proceed in a kind of 'daydream', maybe planning future activities. This attitude is more common among milkers with experience of the whole process of attachment and release of the cluster. It is like a kind of pre-objective appropriation of the cluster as part of the milkers' own body¹⁶⁴.

After the milking unit is attached, the milker moves away from the cow and machine (plate 26). This is an instance of 'attentive detachment'. She would attend for a while to the satisfactory functioning of the milking cluster. The most common problem requiring a milker's intervention is that of vacuum leakage. There are visual clues as to whether everything is going all right in the rhythmic up and down movement of the teatcups. Yet, the clearest sign of error is the sound of 'escaping' air from a teatcup, which might lead

¹⁶³ It happens that some cows have one atrophied teat or udder's quarter. In this case, the corresponding short milk and short pulse tubes in the cluster would be folded to maintain the vacuum in the rest of the teatcups.

¹⁶⁴ Dreyfus calls this kind of everyday skilful performance with things 'transparent coping', which requires 'ready-to-hand' instruments and objects of labour, i.e. a craftsman is accustomed to work with them and the working situation is normal. In transparent coping, the subject-object distinction is dissolved. In his words: 'When we look at our ready-to-hand ways of being with things we just do not find conscious subjects directed towards independent objects at all' (quoted in Costall 1997: 78; see also Dreyfus and Dreyfus 1987: 27). Keller and Keller (1993: 130) discriminate between 'routinary production' and 'novel production', the former being closer to Dreyfus's concept of transparent coping, whilst novelty might lead to a more reflective and planned operation.

to the whole cluster falling off. If this happens, the cluster is re-attached and the vacuum gauge is inspected to check that the vacuum is recovered. Once the functioning of the milking machine is normal again, milkers carry on with other activities within the parlour and the cow is milked without any further intervention on their part. These activities vary from preparing another cow to be milked to writing down some records in a diary or calendar. Also, it is common for milkers to clean floors or simply go on chatting to their fellow milkers or to listen to the radio while drinking *mate*. They even go out of the parlour.

The milking of a cow might last about ten minutes. Before the milking organ is released another cow ought to be ready. On the other hand, a cluster should not be kept attached if the udder has already been emptied, due to higher risks of infection. Therefore, in addition to a tacit knowledge of the time required to milk a particular cow, a good milker regularly looks at the passage of milk through the different parts of the cluster and milk tube. Also, milkers often manually massage the udder to help the milk go down quicker to the teatcup. Furthermore, some pressure might be put on the claw with the hand or a stone in order to increase the vacuum's effect.

'Freeing' a milked cow and transportation of milk to the bulk tank

When a cow has been fully milked, the cluster is removed manually by firstly releasing its vacuum switch¹⁶⁵. The cluster may fall into the supporting hand of the milker,

¹⁶⁵ I was told about the potential installation of automatic releasers in wealthier farms. However, a technician pointed out that dairy farmers do not trust the automatic system. They believe milk might remain in the udder, affecting the economy of the farm as well as the sanitary condition of cows. Therefore, manual detachment of clusters is regarded as more beneficial. Notwithstanding this, my informant suggested that although it would take some time, automatic systems would be adopted in the end, as another way to '*free workers from mechanical tasks*'.

though more often than not she has to pull the claw down gently to release the teatcups. Having done this, the milker turns towards the next cow and the cluster is attached again. Otherwise, the cluster is hung back on its hook. This latter operation is common when the receiving churn is already full. People might know that this is the case by mentally matching the average milk production with the number of cows that have been already milked. This is how I was taught initially. However, there is a more direct relation between an identified lactating cow and the level of milk in the churn, since the order of cows is relatively stable. Yet, practical and sensory confirmation is always conducted. For instance, milkers lift or slightly move the churn to feel its weight. Moreover, it is common to remove the lid of the churn to look inside. The lid is put back if there is room enough, and especially if the next cow is the last one to be milked, in order to avoid having to carry an extra churn to the bulk tank.

When two milkers are engaged simultaneously in milking, the decision made by one of them to release his cluster works as a signal for the second one to check out hers. Nevertheless, in comparison to larger *tambos*, in small parlours the practice of each milker is relatively autonomous and less responsive to that of others.

After the cluster is detached from the cow's udder, the animal is ready to go. Before that, though not necessarily, farmers may dip the teats in a disinfectant to prevent bacteria getting into them while the nipples' sphincters are still open after milking. Furthermore, sanitary treatment may be required (such as the application of curative ointments, the injection of antibiotics or the administration of other pharmaceutical medicines) and this is the best time to provide it since the animal is still relatively immobilised. Afterwards, the hobble is released. The milker opens the front gate of the

stall and the cow walks to a corridor that leads it to an open-air paddock where it remains until driven further into the fields¹⁶⁶.

As mentioned above, once the receiving milk churn is full, it has to be transported to the cooling tank. Milkers have to be careful to avoid any interruption in the milking of cows when this operation is conducted because the vacuum system has temporarily to be stopped. The lid of the churn is released by switching off a vacuum tap in the upper vacuum tube and the churn is then transported to the cooling tank. The heavy container with 40 litres of milk may be lifted up to 1.3 metres in order to reach the inlet hole into the tank. If there are two milkers, both of them take part in the operation. Otherwise, a milker does it alone, despite the physical effort that the operation entails. Women milkers often complain about it. In a few cases, people have built a step or platform with tins or boxes on which to rest the churn while pouring out its contents. Once the churn is empty it is put back in its place, the lid is attached and milking resumes.

Cleaning up the machinery and the parlour

When the last cow has been milked, the cleaning up of the parlour starts. Milking machines must be carefully and comprehensively washed. First, cold water is sucked from a bucket and passed through the machine to rinse it. Second, hot water with

¹⁶⁶ Cows are 'helped' with words and touch to leave their stalls. This happens in both small and large parlours. In the latter case, milkers hammer with a short stick or use their whip upon the fences whilst shouting to the cows to hurry up. A 'disobedient' cow might be beaten as well.

detergent is sucked and passed through the milking system¹⁶⁷. Boiled water is generally brought from a fire outside the parlour or from the house, since it is rare to find an electric boiler in the milking parlour on family dairy farms. Third, the hot water and detergent that went through the pipes are collected in a churn and re-used to wash the lids and clusters using a cloth. Also, the colander of the tank and the churns are washed with the same, already warmer solution. Fourth, all these implements are then rinsed with cold water and left in specific places to dry out, ready to be used in the next milking shift. Fifth, a hypochlorine solution is passed throughout the machine's pipes which are left unrinsed to prevent their colonisation by microbes. Most people do this washing without wearing gloves. Although milkers recognise that cleaning solutions might damage the skin on their hands and forearms, gloves are regarded as 'impractical'. This is not just because of a certain carelessness towards the effects of such chemicals. It seems important to touch surfaces directly in order to discover particles of dirt, and uncovered hands afford a more efficient cleaning-up operation¹⁶⁸.

Apart from washing up the milking machine, floors and the lower parts of walls in the milking room are swept and washed. Throughout the milking time, milkers are continually cleaning mud, urine and dung from floors. Moreover, one of the most celebrated body movements during milking is to 'catch in the air' (with a shovel or

¹⁶⁷ Local farmers might use two kinds of detergents: acid and alkaline. Both of them can be used daily, but in general acid detergent is used more sporadically and depending on the level of mineral salts in the water used for washing. Acid detergent is effective in cleaning the so-called milk-stone (*piedra de leche*) which is the result of the build-up of fat, proteins and minerals in particular corners of pipes. The milk-stone becomes a good environment for bacteria to feed and reproduce, and consequently a source of pollution for the milk (Facultad de Veterinaria 1997: 88). On the other hand, alkaline detergent is used against the build-up of fat and other kinds of proteins.

¹⁶⁸ Needless to say, in those parlours where a pipeline plant has been installed, the washing of the machine is almost entirely automatic and milkers need only replace soap daily and switch the power on. In these parlours, churns are only used to collect calostro and milk from cows under antibiotic treatment to be given to calves.

bucket) the dung of a cow before it reaches the floor¹⁶⁹. If the dung is caught, it is put outside the milking room. Otherwise, it is watered and swept away through a duct with the rest of the effluents.

Once the milking parlour is clean and ready for the next shift, a milker feeds the calves while her/his partner drives the milked cows to the fields (Plate 29). Then the milking routine is over until the evening shift, which will start around ten hours later. The average duration of a milking routine is two hours, though it varies according to the current number of lactating cows, the number of milkers, and the season (e.g., in springtime, milking takes longer due to the improvement in the cows' feeding and the consequent increase in the quantity of milk). Including both daily shifts, milking might take at least four hours in a typical family dairy farm every day throughout the year.

Discussion

From the above description of the milking routine, I wish to draw attention to four relevant points for my analysis of the interface between machines, milkers and milk cows and the effects upon the development of human skills. First, the handling of milking machines during milking is only a part of a complex co-ordination of operations and sequences of operations within the area of the milking parlour, carried out by milkers in order to extract the maximum amount of high quality milk from cows. Second, the fixed nature of milking machines determines certain movements of animals and humans within the milking parlour. In this regard, it is noteworthy that the 'fixity' of a milking machine is not only related to the permanent emplacement of the artefact

¹⁶⁹ Milkers might know that particular cows wait to defecate within the milking room, so they are always ready for this.

but also to its mono-functionality. Compared, for instance, with tractors, which can be used on farms for many different purposes, milking machines lack any kind of 'versatility' (Barnard, Halley and Scott 1970: 96)¹⁷⁰. In this sense, milking machines might be classified as 'simple' artefacts. Moreover, the contrast between tractors and milking machines could be compared to that between oxen and dairy cows. In the work of the farm, the tractor is largely substituted for the ox, and both could be used in any equally whole range of tasks. Dairy cows and milking machines, on the other hand, stand in a relation of complementarity rather than substitution. The machine extends the animal rather than replacing it, so that together, machine and animal comprise a more specialised technological system. Thirdly, the relation of extension between milking machines and milk cows leads to an integrated perceptual attention of workers to both machines and animals. Indeed, we could state that during the milking operation itself, the division between these two components of the environment, mechanical and animate, seems to disappear. It becomes difficult to state where one begins and the other ends. Moreover, in particular circumstances (i.e. in the application of hand pressure on the udder for stripping) the cow, the machine and the human milker become literally undivided parts of a unique system. Thus, the distinction between subject and object is dissolved. Skilled milkers, and therefore their subjectivity, should be

¹⁷⁰ The contrast between tractors and milking machines as mobile and fixed means of production respectively has implications for the labour market in agriculture. To become an expert tractor driver might allow a farmer to engage in permanent or temporary jobs in the locality or beyond its boundaries. Both the multifunctional character of the tractor, and the associated versatility of peoples' skills, open more opportunities for a job seeker. On the other hand, to be an expert machine-centred milker ties one to an activity with rather limited opportunities to find an off-farm employment not far from the household estate.

considered as integral to the so-called 'forces or production' in Marxist terminology¹⁷¹.

Fourthly, in these processes of machine use the transformation of the 'object' of labour is informed by the need to keep a form of animal life going. Milk should be appropriated from cows by mechanical means without jeopardising the reproduction of the animal as a living being and, especially, the organs for the production of milk. As Edmondson put it,

[The milking machine] is the dairy farmer's combine harvester. It is the only piece of equipment that can harvest food from a living animal on a regular basis. (Edmondson 2000)

Lastly, the use of milking machines involves, in principle, a broad practical knowledge of the functioning of all its parts, from the vacuum pump to the rubber liner inside the teatcup. However, this does not mean that a machine user ought to know the theoretical principles that govern the functioning of the milking machine. Indeed, through repetitive performance, people may 'select' specific knowledge that helps them to achieve their goals or to solve problems. As Scribner put it,

From an analyst's bird's-eye point of view, the amount of even so-called specific knowledge required for task performance often appears vast and unbounded. But from the problem solver's point of view, what needs to be known may have quite definite boundaries, drawn in terms of the functional requirements of the task. (1986: 27)

The daily milking routine has then to be understood as a regular process of *coping* with the various relatively stable environmental constituents (i.e. the milking parlour, dairy cows, milking clusters, the vacuum pump, water, fellow milkers, electricity and so on) and more variable components (i.e. the weather, any contingent change of the

¹⁷¹ MacKenzie (1984) has demonstrated that, despite a certain ambivalence in his writings about technology Marx regarded human agency as more important than machines and technology, in themselves, in explaining the evolution of technological systems. Indeed, as Shaw (1979) pointed out, '...for Marx the productive forces include more than machines or technology in a narrower sense. In fact, labor-power, the skills, knowledge, experience, and so on which enable labor to produce, would seem to be the most important of the productive forces' (quoted in MacKenzie 1984: 477).

aforementioned stable constituents), rather than an exercise of theoretical planning followed by practical execution. In the following sections, I attempt to further explore the development of milkers' perceptual skills in relation to machine use.

Machine-use and the decoupling of action and perception

The words 'machine' and 'mechanical' are nowadays generally associated with a process of industrial production where an artefact, or a combination of artefacts, transforms matter in particular ways without the direct intervention of people (Williams 1988: 202). In this regard, I shall show that the concept of 'machine' in the combined term 'milking machine' seems ambiguous, to say the least, if we observe the current use and functioning of this artefact in the whole process of milking.

For the last two hundred years, scholars have focused on the passage from the manual handling of tools to the use of automated machines in production. Undoubtedly, these studies have been fuelled by the changes brought about by the Industrial Revolution in the 19th century (Gaskel 1968; Marx 1979; Quaintance 1984), and the later scientific and technological revolution of the second half of the 20th century (Mumford 1966, 1967; Leroi-Gourhan 1971; UNESCO 1981; MacKenzie 1984; Carrier 1992). In most cases, scholars' attention was directed not only to the history of machines themselves, but also to the interfaces between the production of machines, machine use and the organisation of labour, the subjectivity of workers, and the relations between human labour and their objects of labour in machine centred industry. For instance, Ingold (1988b) has placed the changes in the development of human capabilities on a continuum from the direct manipulation of hand tools to fully automated systems. He

argues that in the manual handling of tools, both motive power and operational constraints are under the control of the operator, comprising a 'skilled system of constraint' (1988b: 162). The operator is engaged in a symmetrical relation with the object of labour and the tool works as an extension of the sensuous body of the worker. Matter responds directly to the workman's movement and action, while the workman in turn continuously adjusts his operations and body strength according to the 'response' from matter's substance and emerging form. Moreover, a tool should be seen not only as a 'conductor' of a worker's activity onto its object of labour (Marx 1979: 285). For tools may, through prolonged familiarity, become the objects of a workman's direct feelings, leading to an 'understanding of them *as* material objects [which] is not confined to their form but extended more deeply into their material' (Feibleman 1966: 327).

As we move towards the other extreme of the continuum, we may find that the process of production is conducted with the help of automated machines, culminating in the emergence of a 'mechanically determining system' (Ingold 1988b: 162). In this case, 'not only the motive power but also the operational constraints are packaged within the same artificial system' (1988b: 160). Indeed, the machine is the objectified form of the accumulation of human experience and knowledge in the transformation of particular materials. As Pye put it,

The tools, jigs, and machines on which the workmanship of certainty will always depend are simply the stored embodiment of the care, judgement and dexterity exercised by the workman at an earlier time. (Pye 1995: 53-4)

Consequently, at the automated end of the continuum, human intervention becomes more significant in the design and setting up of machines. Moreover, human labour is needed to monitor the functioning of the machine more than it is to oversee the concrete

process of the transformation of matter. Therefore, the move towards automation seems to be associated with a practical detachment of the worker from the means and objects of labour. The machine, unlike the tool, is not an extension of the worker's perceptually attuned body but may have replaced it altogether. Between these two extremes, of handling tools and operating automatic machines, there are hybrid types of tool and machine use.

For my purposes, the middle case of so-called 'machine-tools' is the relevant one. The 'machine-tool' differs in use from a 'hand tool' in that, generally, an external source of power has replaced manpower. On the other hand, compared with a fully developed, the machine tool requires skilled and continuous handling by an operator (Ingold 1988b: 159-61). In comparing the handling of machine tools with the operation of fully developed machines, Ingold isolates the transmission system as the source of the definitive technical difference. Thus:

Where mechanisation involves the substitution of machine power for manpower, as in the development of so-called 'machine-tools', the mechanism of transmission [has the function] of converting the rotary movement of the mechanical motor into a reciprocating movement that **imitates** the original movement of the body in its operation of a working part which remains unchanged in form (if not in scale). (Ingold 1988b: 163-4)

On the contrary, a 'real' machine might function through the conversion of the reciprocating motion characteristic of the human body into the rotary motion characteristic of the machine. The important point for my purposes is that this latter kind of conversion of motion represents historically 'the crucial step in the decoupling of perception from action' (Ingold 1999: 434) in working practices. Once the rotary motion of a machine and not the reciprocating movement of the worker's hand becomes

the dominant way of transforming matter, 'it is no longer possible [for a worker] to feel or to respond to the work of the tool upon the material' (ibid.)

In the case of milking machines, the rotary movement of the vacuum pump is converted to a reciprocating movement that imitates the original movement of a calf's suckling. Indeed, the vacuum plays the role of the transmitter or communicator of power to the tool (i.e. the teatcup). However, instead of a continuation of the dialogue between the worker's body and the object of labour, the mediation of milking machines decouples perception from action because a milker does not intervene in the proper action of suckling. The machine does it instead. Therefore, although in their ensemble and functioning, milking machines resemble tools that are handled, their current use might lead to a certain perceptual estrangement of people from both the tool and the object of labour (i.e. the cow).

This is shown, for instance, in changes in the meaning of touch-perception brought about with the shift from hand to mechanical milking. A clear example is the identification of so-called 'hard cows' [*vacas duras*], i.e. those animals that require more physical strength, dexterity and time to milk. In hand milking, the perception of the 'hardness' of a cow is coupled with human movement and labour intensity, whilst in mechanical milking 'hardness' becomes a difference measured only in the time spent by the machine.

Having said that, and though the fundamental operation of suckling milk from a cow has been taken over from the operator by the suckling tool, I would argue that milkers are still at the core of the labour process. The conditioning of milk cows before and

after milking, the need for stripping, the constant inspection of vacuum levels, the transportation of milk to the tank, the maintenance of hygiene and many other activities conducted throughout the concrete process of labour as described above, could not be achieved without the continuous intervention of skilful milkers. It is, in principle, a skilled system of constraint. The final result of the labour process is directly dependent on peoples' subjectivity.

Therefore, mechanical milking has entailed the development of new skills rather than deskilling. Perhaps these new skills are centred more on the manipulation of the different constituents of the parlour and machines than on the animal. Nevertheless, the intimate relationship between milkers and cows is still required. Indeed, both the relations between milkers and machines and those between milkers and cows within the milking parlour could be said to be ones of alternating practical engagement and detachment. The current practice of mechanical milking among *Canarios* dairy farmers, as shown in figure 17, stands at a mid-point between hand milking and 'robotic milking' (Young 1999).

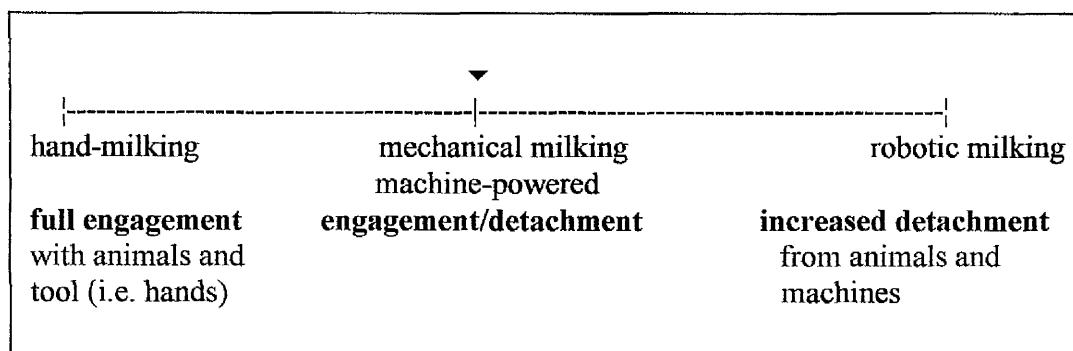


Figure 17. The technical continuum of milking and milkers relations to machines and dairy cows.

The place of machines in the process of milking: between manufacture and industry

What made mechanical milking so important for modern dairy farming was the fact that many proper 'machine-tools' (i.e. the milking clusters) can operate simultaneously, while only a couple of workers (or even a single milker) are needed to attach the tools and conduct general monitoring. Consequently, more cows can be milked at the same time with less human labour than in the case of hand milking. In the nineteenth century, Marx has pointed to the simultaneity of the operations of machine tools and the increase in labour productivity (i.e. more product in the same time) as one of the most significant changes in the passage from the stage of manufacture to machine-centred industry in the development of capitalism in both Western and non-Western countries (1987: chapter 13). He also observed that the use of machines in industry built upon and strengthened an already present fragmentation of workers' tasks in certain manufacturing processes (1987: 438-9). Instead of a workman performing multiple tasks until a product is obtained, firstly manufacture and later on machine-centred industry was organised by fragmenting working operations and human skills. However, in the case of milkers, mechanisation did not lead to this fragmentation of skills, but kept the so-called 'simple co-operation' between workers as it was when hand milking was generally performed. Every milker has to perform an integral labour process to achieve the goal of producing milk in the parlour. It follows that the use of milking machines is not associated with an alienation of workers from either the co-ordination of tasks or embodied intellectual and manual skills (MacKenzie 1984: 484-5). On the contrary, mechanical milking has required an increasing number of other operations in the parlour, new forms of enskillment, by 'liberating' milkers from prolonged direct contact with the teats of a cow. Having said that, the experience of 'robotic' milking in more developed countries indicates that in the near future, we may see the almost complete disappearance of milkers (and their embodied skills) from the milking room (Dittman 1999; Young 1999)

¹⁷². So far as Uruguayan dairy farmers are concerned, however, such developments remain in the realm of pure speculation.

Another important point regarding the changing of skills that accompanies the mechanisation of milking revolves around the learning process. According to the testimonies of farmers, and my own experience as a novice milker, it seems that hand milking is learnt mainly by 'participatory appropriation' (Pickering 1997: 47). According to Pickering, following a distinction made by Rogoff (1995), participatory appropriation 'is more akin to individuals making for themselves a style and a unique set of practices which are the means to achieve goals they have set themselves' (1997: 47-8). In the case of hand milking, a more experienced milker might give you certain advice on to how to do it (e.g., how to hold teats or where to put one's legs to support the receiving bucket). Yet the apprentice has to develop his/her own way of doing it. How long it takes to become a highly efficient hand milker is hard to say with accuracy. It seems, however, to be a long process lasting from early childhood when kids learn how to deal with animals and handle teats, to their subsequent development of the physical strength and dexterity to milk a cow continuously and without breaks and to do

¹⁷² It is worth noting, that according to a recent report (Young 1999), robotic or fully automated milking has meant milkers' increasing detachment from dairy cows *during* the milking routine, but still requires people's concern with cows though in a more flexible time schedule. As a Dutch farmer stated:

'You have to check the milking records and how often each cow was milked. You also have to spend *more time looking through your cows* as you're not handling them in the parlour twice a day.' (Young 1999, emphasis added)

this to several cows in a shift¹⁷³. On the other hand, mechanical milking has been historically analysed by 'scientists' in its particular details, following a Taylorist approach to work (see Leaver 1983; Clough 1977). It is thus frequently presented and taught by 'experts', or even by one farmer to another, as a set of abstract rules to be followed by milkers. Consequently, although slight differences may be found between milkers, there is a core of highly standardised operations that can be learnt in a very short period, even in hours. Moreover, mechanical milking permits the use of human labour embodied in persons (e.g., older people and children) who, in principle, we can assume are less capable of performing hand milking on an industrial scale. Although my data are not sufficient to give a full account of this temporal dimension of learning the 'art' of milking, I would nevertheless suggest that shortening the enskillment process among milkers might have allowed an easier rotation and replacement of waged workers on capitalist dairy farms. Moreover, mechanical milking establishes one of the basic preconditions for the current flexibility of the division of labour on family farms, as shown in chapter 3.

Milking as a multi-sensory process

¹⁷³ It is not surprising that an anonymous advisor in the 1930s encouraged capitalist farmers to limit the numbers of cows per hand milker on a shift, since otherwise the worker would not empty udders completely, aiming to end his work as quickly as possible. Moreover, he suggested to *patrones* that they should always keep the same cows for each milker, in order to enhance their mutual empathy (Anon. 1937b: 265). Without doubt, hand milking set a constraint on the increase of labour productivity. On the other hand, the displacement of traditional milking skills was evident in my informants' accounts of sores hands, wrists and shoulders when electrical or mechanical failure led them to have to milk the remaining cows by hand. I observed that cows might not be milked at all if the milking machine did not work and there were just a few remaining animals. In this sense the following observation, from Feibleman, seems to depict the attitude of my informants very accurately:

I have shown above that a certain degree of decoupling of perception from action is at work among milkers in mechanical milking. Yet this has not meant the displacement of the subjects from the process of production, rather its opposite. Here, I shall explore another aspect of the relation between machine use, human skills and the perception of the (working) environment, namely, the development of sensory systems. I contend that the relative emphasis on visual perception within the milking parlour, due to the use of machines, does not necessarily lead to people's alienation from the world, as might be inferred from the dominant idea in the social sciences of the alienating effects of 'visualism' upon the subjectivity of people in modern societies (Murray Schafer 1989; Ong 1991; Howes 1991; Classen 1993, 1997; cfr. Ingold 2000). Indeed, the dynamic development of farmers' sensory systems is informed by the attentive engagement of milkers within a multi-sensory working environment throughout the milking routine.

In his analysis of olfactory geographies, Rodaway (1994) points out that modern 'smellscapes' have been transformed radically due to the Western obsession with domesticating natural odours, blocking out most of them and/or stressing the abstract simulation of chosen ones in the context of their commodification. He distinguishes between urban and rural settings, stating that in the latter areas, external smells are still essentially undomesticated. However, based on his observations of the English countryside, he finds a trend towards the replacement of natural smells with human controlled smells. In his words,

'The individual who has entered into intimate relations with an instrument with which he is in daily contact, and by means of which his living is made and his social participation established and continued, can hardly be said to be the same as he had been before it and would now be without it. He has become one end of a partnership which is no less firm because the other end is an inert material object.' (Feibleman 1966: 326)

Changes in farm production and technology [...] have altered these [undomesticated] smellscape. The odours of the poultry sheds of modern factory farms and *the modern milking barns with the greater use of machines and concern for cleanliness*, the odour of slurry stores and the ubiquitous oilseed rape, have each changed the olfactory geography of rural England. (1994: 152; emphasis added)

My own ethnography of Villa del Rosario's parlours seems to support Rodaway's view, especially in the case of the increasing olfactory perception of machine-cleaning products, sanitary remedies and concentrates, in the place of manure and other 'natural' smells¹⁷⁴. However, I would suggest that the olfactory sensibility of farmers has not atrophied, and that they are aware of significant and changing odours in the parlour during milking. The clearest example is the meaning of cow's excrement. Its strong smell, associated with a fluid texture, tells milkers that the animal has grazed on fresh pastures. They might even smell the fragrance of graminous flowers in a cow's dung. Consequently, dairy farmers normally assess their animals, and, indirectly, their fields, through particular smells that afford relevant ecological information. Similarly, the odour of milk differs according to seasonal feeding. However, this odour has been increasingly hidden thanks to the installation of direct-to-can or direct-to-tank mechanical milking systems, which in turn were established in dairy farming to avoid the pollution of milk from external 'smells'. Peoples' olfactory as well as haptic systems are also involved in the recognition of the freshness (though not the composition) of concentrates. Furthermore, chemical inputs (e.g. horn-fly repellent) are commonly checked by smelling. An extreme case was an illiterate milker who could not read the labels attached to receptacles, and consequently used to smell each bottle to be sure of its contents. In short, there has been a shift in the milking parlour, conceived as

a smellscape, due to the adoption of modern milking systems, but it would be hard to say that significant smells have disappeared. Smelling values, in association with other perceived information, seem still to be relevant in helping milkers to carry on their job.

Compared with its smellscape, the milking parlour's soundscape affords a completely new experience on the farms. Until the milking machine engine is turned on, there is a continuity between perceived sounds outside and within the parlour. One can hear an orchestra of cocks crowing, the sound of the wind moving the trees and metal roofs, and the roaring of distant motors. Nevertheless, the feeling within the milking room out of the milking shift is generally one of 'internal silence', with the soundscape being something that comes from 'outside'. Inside, the most significant sound might be the cooling tank's automatic starter which informs you that there is stored milk. However, once the milking machine is turned on, a qualitative shift occurs and most natural and artificial sounds are blocked out by the dominant pulsations of the machine's engine and the vacuum pump. Moreover, if a radio set is turned on, this contributes to the 'isolation' of milkers from external auditory information. Once the milking proper begins, it seems that the dialogue of natural sounds, which have a seasonal pattern (Murray Schafer 1989: 93), gives way to a monologue of machine and radio sounds that are uniform throughout the year, though radio news might awake people's consciousness of annual and weekly social events through their listening to particular messages (e.g., information on weekend parties). Indeed, turning up the volume on the radio, in order to drown the noise of machinery, seems to reflect people's attempts to recover the power of sound from the 'sacred noise' of industrialisation (Murray Schafer

¹⁷⁴ Interestingly, the milking parlour after the milking routine smells of, and thus evokes, the smellscape that exists in the house except at meal times. This olfactory perception strengthens

1989: 91). The result is a neat demarcation between inside and outside the milking parlour. It is likely that cows also feel this distinction. Certainly, farmers believe that animals show a better performance in milking when listening to particular kinds of music (e.g. *the tango*). The sound features of the 'outside' world disappear during milking and only re-appear when a person leaves the building or when the engine is shut off. Then, the ears are 'open' again to pick up information from a wider space, advancing and complementing one's increasing visual awareness of the surroundings for as long as one moves out of the parlour. The continuity of the world in this instance appears through the ears as well as the eyes.

On the other hand, as I mentioned in my description of the milking routine, listening for the leaking of a vacuum is an important monitoring function. Hence, people do not become 'deaf' due to the sounds of machinery. Milkers attune their hearing skills to monitoring requirements. The awareness of the falling of teatcups and other daily problems is not, however, necessarily relayed by listening to sounds, but rather through a combination of visual and auditory cues. This was clearly exemplified in the case of a milker who used to work with his 'walkman' on, without any loss of efficiency. Furthermore, a couple of milkers said they knew deaf people who carry on milking without disadvantage. But, with the noise of machinery, conversations between milkers become difficult, though not impossible. Speaking to humans and animals alike in a louder voice is common, especially in small parlours where the machine's engine is not well isolated from the milking room. This fact, I would suggest, leads to the development of skills of co-ordination between milkers based on bodily gestures rather than verbal instructions. From the above analysis of the soundscape of the milking

the idea of continuity between house and milking parlour, and the central role women perform in

parlour during the milking routine, I would agree in general terms with Rodaway when he points out that,

Human sounds, intentional and unintentional, blanket out much of the auditory world around us. Much of auditory orientation is thus lost and perhaps it is no wonder that the eye gains such dominance over the ear in so many situations of everyday life. (1994: 155)

The emphasis on visual information, in monitoring the functioning of machinery and the normal process of milking, is apparent in the historical development of many components of the milking machine. Transparent tubes on the milk line, transparent recording or collecting jars, gauges in the vacuum line and in the cooling tank, and so on, are all material devices which direct the perceiver to develop his visual attention. For instance, Akam (1977) points out that the design of milking machines leads to a visual monitoring of the flow of milk from a cow's udder. He puts it in these terms:

With all units, except those using transparent recorder jars, there is usually some provision *for seeing* when milk flow from an udder is coming to an end or has stopped. Often this is in the form of transparent components or inserts, such as glass transition pieces joining liners to short milk tubes, transparent covers on claw bowls and domes on milk inlet connections to bucket units, and short lengths of transparent tube inserted in the long milk tube. (Akam 1977: 69; emphasis added)

However, to pick up this visual information is not always easy, due to bad lighting in the parlour or the dirtiness of tubes. Machine designers have tried to overcome these obstacles with more devices based on the visual reading of indirect information, such as flow indicators (Akam 1977: 69). *Canarios* dairy farmers, on the other hand, rely on their haptic system to work together with their sight. Milkers touch the milk tubes in the cluster as if they were measuring their pulse, in order to establish that milk is still flowing from the cow to the churn. Furthermore, they touch the cow's udder to feel if there is still milk to be suckled, something that cannot easily be 'seen', other than

through the transformation of the shape of the teats and the udder when they are emptied. This sensuous practice is maintained even in those *tambos* where the installation of newer milking machines warrants better stripping. Having emphasised that touch is significant during milking, I would suggest that the mechanisation of milking has changed its character from a continuous bodily exercise to a more punctuated experience. In hand milking, adult milkers were literally 'attached' to the animal not only with their hands, but also with their head and face when these were placed against the belly of the cow. The movement of the cow was felt by the upper part of the milker's body. Nowadays, the touching of udders and of the components of machines is discontinuous and minimised, allowing milkers to carry on other activities while the animal is being milked. Consequently, visual monitoring of the cow's behaviour in the stall becomes dominant.

This visual monitoring of cows might, in principle, seem to represent a more detached relationship between humans and animals. Nevertheless, this idea needs some qualification, because one important perceptual activity, at least in small parlours, is eye-to-eye contact. To be sure, from the time the cow enters the milking room until it leaves it, milkers 'read', in the way a cow looks at them, the way it feels. For instance, local dairy farmers pointed out that a 'sad look' [*una mirada triste*] means that something is wrong with a cow, and represents 'advice' to look for other symptoms of sickness. This intersubjective communication is enhanced in the parlour where the physical distance between humans and cows is smaller. It is common, for instance, for a cow to turn its head towards the milker and 'express' discomfort whilst the milker is attaching the milking cluster. Eye-to-eye contact may be a very personal and engaging

action, which is at the opposite pole to the commonly assumed, distantiating effect of visual perception. As Berger (1980) put it,

The eyes of an animal when they consider a man are attentive and wary...Man becomes aware of himself returning the look. The animal scrutinises him across a narrow abyss of non-comprehension. This is why the man can surprise the animal...The man too is looking across a similar, but not identical, abyss of non-comprehension...And so, when he is *being* seen by the animal, he is being seen as his surroundings are seen by him. His recognition of this is what makes the look of the animal familiar...The animal has secrets which, unlike the secrets of caves, mountains, seas, are specifically addressed to man. (Berger 1980, cited in Noske 1989: 62)

My contention is that vision during milking routines takes different forms, depending on what milkers are looking at. Certainly, watching the vacuum gauge or the up-and-down of the cluster involves detachment and a certain estrangement, but to see the eyes of a cow or a fellow milker's movements seems to put a perceiver next to his/her object of attention, as part of the same situation, the same lived world. Both attitudes play their role in the labour process and are embodied skills that need to be educated and developed. In short, perceptual detachment and engagement are basic tools for human activity in machine milking practices as performed by *Canarios* dairy farmers.

Conclusions

In introducing this chapter, I pointed out that the guiding question of my analysis revolved around the alienating effects of the industrialisation of milking upon the relations between people and their embodied skills and objects of labour. In this initial part of the chapter, I have focused mainly on the first set of these relations, i.e. people's operational and perceptual skills. In principle, the answer to the question of alienation might be that far from separating people from their skills, mechanical milking has led to their further enskillment. The way *Canarios* dairy farmers conduct the milking routine

in general, and the use of milking-machines in particular, should be seen as closer to the 'workmanship of risk' (Pye 1995) in which,

[...] the quality of the result is not predetermined, but depends on the judgement, dexterity and care which the maker exercises as he works. The essential idea is that the quality of the result is continually at risk during the process of making. (1995: 20)

Therefore, milkers' practical activities guide the process of production and determine its results. This process contrasts with the so-called 'workmanship of certainty' (ibid.:20), where 'the result of every operation during production has been predetermined and is outside the control of the operative once production starts' (ibid.: 52). Consequently, human embodied skills are still a central force in the efficient production of milk, and, furthermore, knowing how to cope with milking machines is one of these skills.

Dairy farmers and/or milkers still control the process of milking based on their attunement to its unpredictable circumstances. This is why permanence in the workplace and the knowledge acquired by practical experience are still 'basic needs' in dairy farming. Machinery and 'objective management' are not sufficient to regulate the production of milk. In other words, the ideal design to produce a good quality and quantity of milk cannot be translated to the real setting of production without highly skilled workmen or women.

I would suggest that the process of enskillment in milking evolves as layers of practices, rather than as a fixed set of rules. In every new milking performance, milkers have to re-present and modify previous practical understandings. The sedimentation and continuous growth of experience is what makes the difference between experts and novices. Indeed, milking practices are a complex set of flexible daily decisions,

judgements and bodily co-ordination that must be understood as subsuming, co-opting and, sometimes, embedding externally made models for action objectified, for instance, in the form and function of milking machines. Cole has pointed out that,

[...] all tools embody simultaneously a theory of the activity they have been designed to fulfil and a theory of the human beings who must carry out the activity. (1999: 405)

I contend that the milking machine (leaving aside the singular example of robotic milking) embodies a theory of human beings that must carry out milking informed by the continuous manual and intellectual enskillment of workers. These skills among milkers refer mainly to the maintenance of milking machines to prevent the pollution of milk, and building co-operative relations both with the dairy cows and with fellow milkers. Thus, mechanical milking not only creates a cow (and milk) for the milker, but also a milker for the cow (and milk). My case study confirms Suchman's assertion that

At the same time that the technological project is one of freezing and objectifying human activities, it is one of animating and finding subjectivity in technical artefacts. (1994: 22)

On the other hand, although we can observe that milking machines are created for milkers, the particular milker may nevertheless become 'the creature of his own invention, an arm of the operating machinery and subservient to its needs' (Feibleman 1966: 326). An example of this is the requirement of the milker to carry the full churn to the bulk tank. Yet, in comparison to waged milkers, family farmers seem to practice a more 'flexible interpretation' (Kline and Pinch 1996) of the design of their machines and milking parlour, though their current financial situation has stopped them from making greater changes to overcome the negative affordances of their machines and/or working environment.

Having stressed that, according to my observations, local milkers have experienced a process of enskillment, we should not forget that the replacement of labour with machines might have signified the enskillment of only a reduced group of workers, while historically a majority of persons were marginalised by such a process. So, consequently, my conclusion refers, in principle, only to those farmers and milkers who have remained in the business. What has happened to those workers made redundant, and to their embodied skills, should be the subject of another study.

I have also shown in this chapter that milking is conducted within a multi-sensory working environment. I have argued that together with a certain emphasis on the development of vision as the dominant mode of milkers' engagement with machines and animals, and between milkers, other perceptual systems have co-evolved in the relation between humans and the working environment. Moreover, the emphasis on the visual registering of environmental information has not led to a one-sided 'visualist' detachment of milkers from their surroundings. Indeed, my ethnography shows that there are different ways of seeing. Some of them, as in the case of eye-to-eye contact between milkers and dairy cows, or the visual apprehension of the landscape once outside the milking parlour, draw the perceiver into the world, which is contrary to the commonly held idea that vision can only give a fragmented and estranged knowledge of it. The mutual development of the working environment and milkers' perceptual systems confirms that human perception is not given naturally, but rather what is specifically human is that the senses are created by the people themselves through their practical activities. As Méztáros pointed out,

As the world of nature becomes humanized—showing the marks of human activity—so do the senses, related to humanly more and more affected objects, become specifically human and increasingly more refined. (1970: 201)

The tuning of farmers' senses to the changing multi-sensory working environment of the milking parlour is one more piece of evidence for their continuous enskillment and the absence of any kind of machine-led estrangement.

Finally, I would suggest that after one decade of mechanical milking in Villa del Rosario, milking machinery has become a 'natural' component of the environment of farmers, and indeed, with rare exceptions, a very welcome one. Schivelbush has pointed out that the idea of technological change leading to new ways of perception makes sense 'only as long as the archaism of [...] a traditional, old-fashioned perception still exists' (Schivelbush 1986: 193). I believe that the widespread positive attitudes among local farmers and waged workers towards machinery in general, and milking machinery in particular, derive from their experience of the transition from labour intensive to machine intensive work. The experience of manual milking is embodied in memories expressed not only in explicit narratives, but also in the forms of hands, fingers, body pains and injuries. It is not surprising that the present working practice in the milking parlour is regarded as more comfortable than in the recent past, i.e. 'effortless' [*sin tanto sacrificio*]. Without doubt the mechanisation of milking has been a practical setting, albeit not the only one, for such conscious reflection. As farmers said: '*Machines have made our work fit for humans*'.

In the next part of this chapter, I turn my attention to current relations between *Canarios* dairy farmers and dairy cows. I shall show that the skills of coping with machines have their counterpart in people's concern with dairy cattle and that, indeed, machines, animals and humans are components of the same developmental system.

Part 2. Relations between humans and dairy cattle

Introduction

Throughout this dissertation I have drawn attention to various dimensions of the interplay between dairy farmers and dairy cattle. For instance, its ecological and economic value was initially described in chapter 3, where the divisions of labour by gender and age for tending and milking dairy cows were described. Moreover, in chapter 5 I have shown how the reciprocity between humans and cattle constitutes the daily rhythms of work and consequently punctuate lived temporality. Thus it could be fair to say, paraphrasing Evans Pritchard (1940: 16), that the way to understanding recent changes in *Canarios*' lifestyle lies in the injunction *cherchez la vache*. In this second part of the chapter concerning the interface between milkers, machines and dairy cows in daily life, and particularly in the experience of milking, I shall further explore *Canarios* dairy farmers' 'concern with animals' (Ingold 1994: 19), aiming to contribute to the current debate on the evolution of relations between humans and domestic animals, in the context of the modernisation of agricultural practices (e.g. Clutton-Brock 1994). My contention is that there is a fundamental ambivalence in the ways local dairy farmers engage with their domestic animals. On the one hand, animals are perceived as living beings that interact reciprocally with people. On the other hand, there is a trend towards the reification of animals rooted in the economic imperatives of modern dairy farming which are oriented towards the maximisation of profit. I suggest that the direct involvement between men and domestic animals does not automatically impede the alienation of the latter from the former. Whereas the daily practice of family dairy farmers, especially in milking, instils an intimate and affectionate attitude towards

milk cows, this is becoming increasingly weak among waged milkers working in a more rationalised process of production. This part of the chapter begins with a discussion of the place of modern dairy farming, as observed in Villa del Rosario, in the current debate on human-animal relations in industrial farming. I shall show that modern dairy farming does not necessarily lead to the practical separation of dairy cows and farmers. What is necessary to explain, however, are the particular qualities of the relation between humans and animals, marked as they are by a trend towards increasing reification of the latter. Then I move to the analysis of the kind of human-animal relations manifested during the milking routine, to show that the raising and exploitation of cows as milk 'producers' requires the farmers to establish attitudes of both trust and domination towards their cows. Moreover, it will be argued that common mechanisms of sociality can be found between humans that are homologous¹⁷⁵ to those between milkers and dairy cows, informed as well by the tension between a respect for agents' autonomy and the asymmetrical imposition of one person's will upon another. In the last part of the chapter, I explore the dominant use of the machine metaphor to refer to dairy cows, as well as the processes of individualisation and homogenisation of animals, as means and manifestations of the contradictory process of turning cows from living beings into mindless biological machines.

¹⁷⁵ I follow Rose's (1998: 32-34) distinctions between metaphor, analogy and homology in the scientific idiom. In a metaphor 'we liken some process or phenomenon observed in one domain to a seemingly parallel process or phenomenon in a quite different domain'. Or to put it in another way, 'metaphors are not meant to imply identity of process or function, but rather they serve to cast an unexpected but helpful light on the phenomenon one is studying'. On the other hand, an *analogy* 'implies a superficial resemblance between two phenomena, perhaps in terms of the function of a particular structure'. Finally, a homology 'implies a deeper identity, derived from an assumed common evolutionary origin. This assumption of a shared history implies common mechanisms'.

The dominant view of the evolution of human-animal relations could be depicted as a passage from the *collection* of animal resources, normally exemplified by so-called hunter-gatherer or foraging societies, to the *production* of animals to obtain both food and labour. The latter is generally referred as the process of domestication of animals. It would have begun around 9,000 years ago in western Asia with the taming of goats, and its extension to other species of animals, especially ungulates (Clutton-Brock 1994: 25). This economic and social transition is generally associated with the gradual achievement of human mastery over animals. In this sense, the theory of the domestication of animals generally assumes the increasing passivity of the animal species, while agency is attributed solely to humans (Noske 1989: 6; cf. D. Harris 1996). However, much ethnographic research among those people who 'domesticate' animals has shown that animals, and perhaps plants, are not regarded by them as natural entities lacking agency (e.g., Hutchinson 1996). The depiction of domesticated animals as beasts without any chance to modify their environment, including their relations with humans, seems to be more a theoretical artifice of mainstream Western philosophies and ideologies than an accurate description of reality. On the other hand, the analysis of human-animal relations under conditions of so-called factory farming in many parts of the world shows that there might be significant economic and social reasons for the emergence of a reified and commodified notion of domestic animals in the context of industrial production (Adam 1998; Clutton-Brock 1994: 34).

Noske (1989), in her book *Humans and Other Animals*, pointed out that,

Before the rise of capitalism animal subsistence cycles were disrupted and changed. Under capitalism animals have come to be totally incorporated into production technology. (1989: 14)

The above passage sums up Noske's argument that while the process of domestication of animals to satisfy human needs does indeed have a long history, a qualitative difference in the constitution of human-animal relations has emerged since the development of the capitalist system of production. She found remarkable similarities between the exploitation of human labour in machine-centred industry and the exploitation of domestic animals with the aim of maximising monetary profit in the market and the resulting accumulation of capital.

Through a heterodox reading of Marx's ideas on the alienation of workers in an industrial factory, Noske (1989: 15) showed a similar trend of alienation from their 'animality' or creativity as living agents, among domesticated animals raised on factory-farms. Although Noske does not explore the theoretical consequences of using the Marxian concept of 'exploitation' (i.e. the private appropriation of surplus value) to depict human-animal relations (cf. Ingold 1980), she does draw an analogy according to more apparent features of the capitalist process of production¹⁷⁶. Thus, according to her

¹⁷⁶ Noske's (1989) work presents another theoretical problem. She moves too easily from an ahistorical and universal definition of an animal's species-being—a kind of evolutionary baseline—to the historical changes effected upon this baseline. She needs such a naturalisation of a species-being to argue for the negative effects of human activity as currently conducted in factory-farming. She claims that humans should not modify this baseline, not only out of respect for animals' rights, but also to improve peoples' own livelihoods. There is a general sense that animals, including human animals, are losing something under the actual conditions of production. The problem is to define that thing that is supposed to get lost. Some of my informants would agree with Noske's ideas of the loss of the baseline. For instance, one of them pointed out,

What is natural should continue to be natural. The cow has changed for the last 15 years for the worst. For instance, nowadays it must be injected with antibiotics every month. We are adding more and more things into nature. It is sad, but it cannot be stopped.

(1989: 18-20), the main aspects of animals' alienation under capitalism are the following. First, animals are separated from their 'product'. For example, offspring are detached from their mothers. Second, domesticated animals might experience the alienation of their fully productive capacity when forced to specialise in 'one bodily "skill" [which] implies the extracting of one single part from a totality which *is* the animal' (Noske 1989: 19). Third, domesticated animals are alienated from nature when raised in artificial buildings and fed with substances that their digestive organs find hard to assimilate. Furthermore, it seems that animals in factory farms lose the capacity to cope with new and unpredictable situations, and that this has led to the spread of several diseases in an increasingly fragile situation. Fourth, domesticated animals are estranged from fellow animals and human beings both through their isolation and through being crowded into reduced spaces. In any case, the effect is the loss of the social character of many domestic animals.

Many of the above characteristics of the supposed alienation of domesticated animals under industrial production could be observed on *Canarios* dairy farms. As mentioned in chapter 3, new-born calves are normally separated from their mothers a couple of days after their delivery and encouraged to feed on grass and concentrates as soon as possible, inducing frequently serious digestive disorders that can end up in the death of young animals. Obviously, dairy cows are raised for their capacity to produce milk and

I believe this testimony touches the heart of the problem of human-animal relations in modern dairy farming. Namely, who does ultimately decide the kind of relation between farmers and their domestic animals? My contention is that what is lost is not any kind of primeval 'animality', but rather a certain affinity and diversification in relations between humans and domesticated animals that might be swept away under the current capitalist conditions of production. In other words, the problem of alienation should not be focused on the loss of any kind of essence, but rather on the emergent qualities of the relations between organisms and environment. Human and non-human alienation from other components of the environment might mean loss of creativity in the transformation of the world (see Dickens 1996: 65 for a

the efforts of dairy farmers are directed to enhance this capacity above all else. Milk cows are fed with forage that farmers select for them both in quantity and quality. Finally, lactating cows are separated from other conspecifics (e.g., dry cows, bulls, and calves). Indeed, the purposeful transformation of dairy cattle and their environment by constraining and directing the autonomous development and growth of animals has been a historical 'trademark' of dairy farming in Uruguay, especially evident when compared with the traditional beef cattle ranching system (Barrán and Nahum 1977: 132). The Uruguayan historians, Barrán and Nahum, wrote of the meaning of a dairy cow in the 1920s in the following terms.

The cow became a real machine [*sic*] that gave a product, i.e. milk [...] The dairy farmer's obsession was his animal's product, rather than the animal itself. The animal was sacrificed in its nature for the sake of milk, both in quantity and quality. (Barrán and Nahum 1977: 132)

These authors also mention the practical means to satisfy the dairy farmer's 'obsession'. First, male calves were slaughtered or sold immediately after birth to avoid feeding them with cows' milk. Second, calving was limited to the autumn with the aim of increasing milk production while available forage decreased. Third, the ovariectomy of cows was performed to increase the level of butterfat in the milk produced. Compared to the current situation of dairy farming, things are not so different, though ovariectomy is not practised anymore. The 'obsession' with better control of the conditions of dairy cows' growth and development is still in place and it can be said that dairy farmers have succeeded in their attempts to match their expectations with real results. This can be seen, for instance, in the extraordinary increase in the amount of milk produced per cow

similar conclusion). Having said that, for the sake of my argument I shall continue presenting Noske's model.

per day, which has multiplied by three over the last 50 years¹⁷⁷. Therefore, if we follow Noske's ideas, we might conclude that dairy cows among *Canarios* dairy farmers have been alienated from their inner and external nature as this was known, at least, before the advance of capitalist agriculture.

However the last feature presented by Noske, relating to animal's alienation or separation from human beings, needs some investigation. I would suggest that the current transformation of a dairy cow's 'animality' has not led to the detachment of farmers from animals, or reciprocally of cows from humans. On the contrary, modern dairy farming as it has evolved in Villa del Rosario shows a high degree of practical engagement on the part of farmers with their cows. Interestingly, the above Uruguayan historians Barrán and Nahum observed a similar trend among dairy farmers that ran counter to the predominant human-animal relation in cattle ranching. In their words:

The surveillance over milkers, the daily trade in the market, and the need to look after the milking parlour and dairy cattle demanded from the dairy farmers the development of a 'master's attentive gaze'. (Barrán and Nahum 1997: 133)

However, the 'attentive gaze' of dairy farmers and their concern with dairy cows does not mean that the latter would not be reified. There is a constant tension among dairy farmers between the objective need for reification of dairy cows in the context of capitalist agriculture and the intimate relation built with them in daily life. In the following section, I explore this ambiguity by focusing on the milking routine as described in the previous part of this chapter.

¹⁷⁷ Adam (1998: 143) has noticed that the total amount of milk yielded by a dairy cow under 'industrial' conditions has not radically surpassed the capacity of a dairy cow raised and milked in a non-industrialised farming context. The difference has been the shortening of the 'useful life' of a dairy cow. A 'modern' dairy cow is assessed according to the amount of milk yielded on a day, a month or a year, without considering its full potential life-span, but rather the maximisation of production in the shortest possible period. The metaphor of animals as

Trust and domination in the relations between dairy farmers and dairy cows

Canarios dairy farmers explicitly recognise the significance of milkers' care for lactating cows during milking times. They believe that a lactating cow would 'hold-up' its milk if it is not feeling 'comfortable'. I have mentioned already that biologists have studied the basic physiological processes involved in the production of milk within a cow. They showed, among other things, that for a cow to be milked, the milk has to come down to the bottom part of a cow's udder. Moreover, this process depends on the secretion into the blood of the hormone oxytocin. The secretion of oxytocin is said not to be 'consciously' controlled by the cow, but rather to be influenced by the general wellbeing of an animal within a particular environment (e.g., the milking parlour). According to the experience of dairy farmers, the 'let-down' of milk in a cow (which is the perceived consequence of the secretion of oxytocin) might respond to a series of different environmental stimuli like the perception of the presence of its calf or a regular milker, the smell and taste of concentrates in the parlour's manger, the sound of a particular type of music or the milking machine. However, the 'let-down' process might also be cut-off 'by' the cow's feeling of 'fear' [*miedosa*] or 'finding strange' [*extrañando*] that in turn could be the consequence of unpredictable factors. The sense of 'fear' in cows, according to milkers' observations, might be triggered when an animal becomes stressed after perceiving a violent gesture from a milker (e.g., a sudden lifting of his or her arm). On the other hand, the sense of 'finding strange' may be the result of a cow's perception of a foreign person in the milking parlour. Also, any

machines (see below) achieved its full meaning under capitalism. As well as with machines, the owner of a dairy cow wants to recover his/her invested capital as soon as possible.

perceived change in the normal sequence of events during the milking routine might lead to this kind of sentiment. The point is that a milker can influence the process of oxytocine release and milk 'let-down' through keeping a relatively similar milking routine twice a day throughout the year. More importantly, the basis for good milking practice is the establishment, at least temporarily, of a symmetrical relation between milkers and dairy cows.

In this sense, I would suggest that a relation informed by the 'principle of trust' (Ingold 1994) between milkers and dairy cows ought to be, and generally is, displayed during milking times. Ingold explains the principle of 'trust' as

a peculiar combination of autonomy and dependency. To trust someone is to act with that person in mind, in the hope and expectation that she will do likewise—responding in ways favourable to you—so long as you do nothing to curb her autonomy to act otherwise. Although you depend on a favourable response, that response comes entirely on the initiative and volition of the other party. [...] Trust, always involves an element of risk—the risk that the other on whose actions I depend, but which I cannot in any way control, may act contrary to my expectations. (Ingold 1994: 13)

Apart from any scientific explanation of the process of oxytocine release and cut-off, local people relate to their milk cows as living beings with volition. Cows might be partially manipulated, but never completely subordinated. Consequently the production of milk in modern dairying as observed in Villa del Rosario seems to require the development of friendly and reciprocal relations between milkers and cows if the former want to obtain the latter's product. It might be difficult to assess the degree of 'consciousness' of a cow of its opposite and complementary position in this relation. Yet local people believe that dairy cows are 'aware' of this reciprocity. Peoples' awareness of their cows' awareness is not a kind of anthropomorphism. Indeed, dairy farmers cannot clearly objectify in words what cows perceive. However, they explained

this reciprocal relation by showing, for instance, that some cows might only allow particular milkers to milk them. Otherwise, these cows would kick the milking cluster or would not 'give' their milk. On the other hand, if a milk cow will not co-operate in the establishment of the needed reciprocal relation with milkers it will be culled from the milk herd. Hence, underlying reciprocity there is always the chance to shift towards a relationship based on domination.

Indeed, apart from the interaction in milking most of the practices involved in cattle management seem to be guided by the 'principle of domination'. The main goal of domination is to

secure the compliance of the other by imposing one's will, whether by force or by more subtle forms of manipulation. [This] is an abrogation of trust, entailing as it does the denial rather than the recognition of the autonomy of the other on whom one depends. (Ingold 1994: 16)

I have shown in the previous section that the dairy farmer's will is imposed upon the milk herd in different forms. I should emphasise that dairy farmers' control over domesticated animals is partial and never absolute, because cows are not just man-made artefacts despite enormous research efforts dedicated towards the unattainable end of engineering nature to a human design. A shift in the balance of human-animal relations towards domination might not necessarily lead to the 'reification' of animals, i.e. the conversion of non-human animals into external objects without agency (see Descola 1994: 341). In a relation of domination, which generally involves the use of physical force, the animal (or another human) is still considered as a sentient and active being, and not as an inert object. Thus the principles of both trust and domination presuppose agency in animals as well as humans, something that has been missed in the dominant story of domestication (Ingold 1994: 17).

I contend that the relations between *Canarios* dairy farmers and dairy cows embody a tension between the principles of trust and domination, contrary to Ingold's claim that these two principles are 'mutually exclusive' (Ingold 1994: 16). Furthermore, I shall argue that this tension in relations between humans and animals is analogous to that in the relations among human beings themselves. The latter seem also to be constituted through the changing dynamics of trust and domination which, in turn, influence the ways dairy farmers engage with their dairy cows.

Human sociality and human-animal relations

I pointed out that *Canarios* dairy farmers exercise domination over their milk cows, but also develop relations of trust with them. My study shows that both processes involve the agency of the human and the animal. There follows the question of whether human-animal relations provide any clue to understanding sociality among humans. Ingold points out that,

[...] the domain in which human persons are involved as social beings with one another cannot be rigidly set apart from the domain of their involvement with non-human components of the environment. Hence, any qualitative transformation in environmental relations is likely to be manifested similarly both in the relationships that humans extend towards animals and in those that obtain among themselves in society. (Ingold 1994: 2)

May we find an analogous process of domination laced with trust in the domain of social relations constructed and experienced by people in modern dairy farming? I believe so. I hope to have shown that family dairy farmers have experienced a reduction in their autonomy as producers as soon as they became part of a system of strong industrial integration (see chapter 3). Of course, local farmers have never been fully

independent mercantile producers. Yet, under current social and economic conditions the making of their livelihoods is more influenced by decisions taken beyond their personal control at national and even international levels. The point is that in a broader sense, relations between humans are moulded through domination, operating mainly through the market mechanism. On the other hand, at a local level, the principle of trust between people needs to be developed to counteract the encroaching effects of the domination of capital. On a daily basis, the continuity of local farmers' way of living relies heavily on the growth of intersubjective relations following the principles of trust and co-operation with autonomy. This principle manifests itself in mutual aid arrangements between households, but also in intra-household gender and inter-generational relations. The latter seem to me paradigmatic of the principle of trust.

Yet can we so easily establish this bridge between the social world and the world of human-animal relations? The connection is not immediately apparent, but it does exist. It is not mechanical, but mediated by many technical and social events that are continually changing. Let me present two brief examples to show how the 'social' and 'ecological' relations might be mutually constituted.

One morning at the end of summer on a family dairy farm I went to a paddock with Roberto (aged 21) to open a couple of rolls of dry hay to feed a dozen cows after the morning milking. While the cows were being driven from the parlour to the paddock one of the animals strayed, knocking down a wire fence. Roberto claimed that that particular cow was 'useless', not only because it was giving a poor yield of milk, but also because it was not the first time it had damaged fences and pastures. The young farmer and his dog brought the cow back to the paddock, and the fence was repaired.

The day continued as usually. During the evening milking, we were at the parlour together with a friend of the family. The cows were entering in their normal order, when the awkward cow tried to come through first, jostling the other animals and creating some confusion. Roberto then, without saying a word, took a shovel and violently hit the back of the cow, breaking the thick wooden handle into two pieces. The cow then forced its way out of the stall and escaped without being milked. We kept quiet while the cows were again entering the milking room. Back in the house, after we had driven the milked cows to a nearby paddock, Roberto's mother, Rose, the head of the household estate, was told of the incident. She responded by saying that this cow was a real problem, suggesting that measures should be taken to put a definitive end to incidents of this kind. Roberto's younger brother, Eduardo (aged 11), was involved in the conversation too, and he became very angry because the animal that had been hit was 'his' cow, given to him as a gift by Rose. Amidst irony and arguments between the brothers, the topic was rapidly put to one side. Next day, when I asked Rose in private about the incident, she expressed her disapproval of her older son's rude attitude. Moreover, she recognised that Roberto is usually bad-tempered in dealing with dairy cattle, mistreating animals if the latter do not act according to his expectations. She proceeded to say that she had tried to explain to him that running a dairy farm required a different attitude, and that one should be more 'responsible' about the health and condition of milk cows. Yet she felt that her son did not care too much because, she added, he does not like dairy farming. Rosa believed this was the consequence of a very early initiation in the job when her husband died and Roberto, at the age of 11, assumed a significant role in the daily running of the farm. Thus, she concluded, he might be fed up. On the other hand, Roberto's own comments confirmed his lack of affinity with the productive orientation of the farm. He would prefer to do something else on the farm,

but he was not able to come to terms with his mother about it. Indeed, he had no clear alternative to dairying; moreover the issue was never explicitly debated between them. Roberto's 'domineering' attitude towards milk cows might be seen as a reflection of the difficulty of building a more open relation with his mother, who embodies the power of decision-making in the household and represents the current household's orientation.

My second ethnographic example comes from a non-family dairy farm, and further illuminates my point about the analogy between human-human and human-animal relations. Whereas on a family farm daily working co-operation is based on tacit agreement between kin, on a capitalist dairy farm co-operation is based more on formal contract. For instance, a milker might sign a document where it is stated that he will receive a wage in cash and, though not necessarily, food and lodging for his work. In return, he has to conduct the milking routine according to certain rules established, in principle, by the owner of the farm [*el patrón*] (e.g., daily schedules, maintenance of the milking machinery and so on). (See plate 28.) My analysis of the milking routine in the first part of this chapter has shown that good results in milking are greatly influenced by building a longstanding relationship between milkers and cows. Barnard, Halley and Scott (1970: 47) stress three basic features that the 'human element' (i.e. milkers) should embody for the efficient production of milk: a high degree of manual competence, the ability to make day-to-day management decisions, and a certain level of stockmanship. The latter is defined as a 'fundamental sympathy with and understanding of farm animals [...] Examples are the quick eye to notice when a cow is off-colour and a knowledge of the idiosyncracies of individual animals' (1970: 47). Consequently, if a milker developed over time the capacity for 'patience' and a certain affection towards his *patrón's* dairy cows, the yield of milk would be greater than

otherwise. This effect of good milker-cow relations is well appreciated by the *patrón*, who would see his wealth reproduced and, perhaps, increased. However, the positive attitude of waged-milkers towards lactating cows needs to be maintained and reconstituted every day. It seems that the only way to guarantee, at least partially, its continuation is for the employer to maintain good relations with his waged-workers. These good labour relations are attained, mainly, by providing a comfortable working environment and by passing on a share from the milk quality bonus paid by the Co-op to the owner of the farm. If the relations between a *patrón* and his *tamberos* evolve in a relative 'harmonious' way (i.e. if both parties are relatively satisfied with each other's practices), the same would be achieved between *tamberos* and animals during the milking routine. It is not surprising that the manipulation of human-animal relations in production has been used as a tool to demand better relations between the *patrón* and the *tamberos*¹⁷⁸. Two young waged-milkers told me that they normally delay milking when their payment is also delayed, disrupting the milking routine so necessary for normal suckling of milk. On the other hand, many *patrones*, who clearly understand this connection between human-human and human-animal relations, operate upon the former relation by increasing direct or indirect surveillance of their workers' practices, and consequently choose the principle of domination. As an older man put it, summing up a common belief and practice: '*A dairy farm cannot work properly if the patrón is far away. I have never heard of a dairy farm which is going well if all the responsibility falls into the workers' hands*'. Moreover, a waged-milker might be fired if he does not perform 'efficiently' according to his *patrón*'s evaluation, which is not a rare situation. Indeed, I would draw the following analogy: milkers in a non-family farm are culled as

¹⁷⁸ According to a newspaper's article in the 1960s, waged-milkers would have left milk cows unmilked 'every time a boss aggravates their exploitation and negates their labour rights' (El Popular, 1-10-66, quoted in González 1994: 135).

dairy cows are: the latter are assessed by their reproductive and yield records, while milkers are assessed according to labour productivity and the quality of milk objectively measured at the Dairy plant¹⁷⁹.

Milk cows as machines

Anthropologists and other social scientists agree that under conditions of capitalist farming, domestic animals are generally treated and conceptualised as 'mindless machines' (Ingold 1980: 88). For example, Tapper wrote,

Urban-industrial society [...] is dependent for animal products on battery or factory-farming. The animals that feed us are reduced to machines, kept in artificial conditions in which the concern of the owners is profit through cost-effective organization of the animals' productive labour and reproduction. These are clearly exploitative relations on classic capitalist lines. (Tapper 1988: 53)

It is also common to associate such a mechanical view of animals (and of the world) with the emergence of a sense of alienation of humanity from nature. In other words, to see animals as automated machines instead of 'a centre of immanent, self-generating or creative power' (Goodwin 1988: 108) might be an expression of the practical estrangement of people from other non-human components of the environment. The philosophical source of the proposition that animals are machines, complex but still mechanised unconscious organisms, is commonly attributed to Descartes (Goodwin 1988; Maehle 1994: 86; Marx 1987, footnote 111: 474). Moreover, Descartes' ontology has also been identified as the basis for the development of the still dominant

¹⁷⁹ In a recent article the analogy between workers and milk cows was taken to its extreme as follows: 'The cow is an employee of the farmer. As in any other business, it is the job of the manager (farmer) to maximise the output, in the least amount of time and with the minimum amount of effort. As with all other employees, in any business, this job is made easier where the

positivistic scientism of the Western world, and its notion of an external nature to be subjugated by human will and effort (Adam 1998). The logical conclusion follows: if an anthropologist finds that the people he is studying consider animals to be machines, then they must be modern in outlook and alienated from the natural world. However, my ethnography shows that this argument is too simple, and fails to take into account the current practice of farmers with domestic animals. Tapper's (1988) article, although insightful, exemplifies this misunderstanding. In his analysis of the different types of human-animal relations of production, he puts people at the centre in all his examples of pre-industrial societies (Tapper 1988 52-3), whereas when he describes the situation in urban-industrial societies people disappear from the scene as if the 'factory-farm' worked by itself. I contend that modern family dairy farmers relate to their dairy cows in different ways, and moreover that local people may consider dairy cows not only as automata, but also as beings with agency and volition. This observation shows, on the one hand, the limits of a mechanical perspective on animal life, but also the limits of a social theory that does not take into account the contradictory dynamic of peoples' engagement with animals (Ellen 1999), and with the rest of the environment. Pálsson (1990: 130) has suggested that this contradictory dynamic in human-animal relations, and the consequent representation of what an animal is, might be the result of similarly complex processes in the realm of the human social relations of production.

attitude and environment is stress free and comfortable. The cow's job is to come in from the field, to produce high quality milk and return to the field to yield more milk' (Costello 2000).

In Uruguay, most scientifically informed extensionists use machine-like metaphors to talk about dairy cows¹⁸⁰. It is a typical way to explain to farmers certain characteristics of the biology of cows and the management of a dairy farm. For instance, one can read in a guidebook given to dairy farmers enrolled in a distance learning course that:

The cow eats food (*raw material*) that is transformed in the rumen, liver and intestines. Then, nutrients pass to the blood and are distributed to the whole organism. When they reach the udder (*the factory*), secretor cells use them to produce milk. (Facultad de Veterinaria 1997: 29, emphasis added)

Such linguistic expressions reflect an assumption on the part of rural extensionists, that local people might understand better if mechanistic metaphors are used. I think the extensionists are right. Farmers themselves commonly refer to their cows as machines. For instance, it was common to hear that

A milk cow is like a machine. You feed it well and it produces milk.

The idea that the dairy cow is a machine to transform pastures on milk can be found in an early Uruguayan manual on livestock production and agriculture (A. Montero 1909). Moreover, a seminal book by New Zealander, which has been an obligatory reference for Uruguayan technicians since the 1970s, was entitled 'From pasture to milk' (McKeenan 1970). In local usage, the shorthand to explain the basic principle of modern dairy farming has shifted to '*What comes in through the mouth, goes out through the udder*'. I believe this kind of expression connotes the presence of a passive animal, to be used as any other tool to achieve an intended result. Moreover, I would suggest that the use of the mechanistic metaphor might be associated with the ignorance

¹⁸⁰The idea of animals as machines is applied not only to dairy cows, but also to pigs. A University extensionist was categorical: '*The female pig is a biological machine to produce meat*'. Moreover, I found in a seminal textbook for Uruguayan agronomists the use of this kind of metaphor not only for the animal kingdom but also regarding plants. Boerger (1928) wrote

of the process of milk production within the cow. The prime cause (fodder) and the result (milk) are known, but what is going on in between is generally unknown (and for practical purposes might be irrelevant), and a matter of specialised expertise (e.g., for veterinarians)¹⁸¹. As in the relations between industrial workers and machines, things within a cow are seen to happen for themselves and thanks to its internal needs (Braverman 1974: 268).

It is remarkable that, at the same time that dairy cows might be depicted as machines, milking machines are sometimes described using organic metaphors¹⁸². For instance, it was written in the above-mentioned guidebook that:

The vacuum pump is the *lung* of the milking machine. (Facultad de Veterinaria 1997: 62; emphasis added)

Moreover, farmers call the milking cluster *el órgano* [organ]. The metaphorical inversion of dairy cows as machines and machines as organisms might also indicate that the boundary between the man-made and natural worlds is blurred. Somehow, the first nature became second nature, whilst what is commonly referred as second nature became first nature. The 'artificialisation' of the 'natural' is paralleled by the 'naturalisation' of the man-made world. Indeed, I would argue for the emergence of an integral view of the environment among local dairy farmers, in which different

that farmers should convert their plants into 'machine-plants', in the sense of improving their capacity to transform solar energy in organic matter.

¹⁸¹ When I asked a highly educated farmer about the use of the metaphor, he replied that indeed the real 'machines' are the microbacteria which live in the cow's rumen and transform organic matter into inorganic substances.

¹⁸² The conception of machines as living organisms has a longstanding history in Western thought. Indeed, according to Williams (1988: 202) the terms mechanical and organic were very close in meaning until the 19th century. Rose point out that,

components become parts of the same reality. In other words, the relation between machines and animals would be homologous instead of analogous; both 'objects' might share a common evolutionary origin rather than existing in different domains (see Rose 1998: 32-4, on the distinction between analogy and homology). Yet in contrast with other non-dualistic experiences and ideologies described by anthropologists among non-Western people (Descola 1994; Rival 1996), modern *Canarios* dairy farmers seem to include most environmental objects and events in a humanised world, a reality deeply transformed by human action. This falls with what Thrift has suggested, following Strathern (1992), that

[...] because much of what we regard as 'nature' can no longer survive without human intervention [...] society is no longer understood as separate from nature. (Thrift 1996: 261)

Yet, a dairy farmer who talks of his dairy cows as machines might, on another occasion, qualify or even contradict this view in insisting that animals are quite different from machines. As one dairy farmer made clear:

An animal gives its production, whilst a machine must be fed.

The daily engagement of dairy farmers with their cows makes it difficult to keep up a 'purely' mechanistic metaphor. I believe this tension is expressed in the remark cited above. On the one hand, as we have seen, the cow-as-machine must be fed too, if it is to produce milk. However, agency is restored to the animal whose milk is seen not to be taken from it, but to be offered to the milker. As I have shown this is strongly related to the particular interaction between milkers and cows during the milking routine. Moreover it is not rare to find local people using certain anthropomorphic metaphors to

'The very fact that [biology] developed in the shadow of physics, with physics' goals of mathematical rigour and idealized predictive capacity [has led to] the power of technological metaphor in biology, whereby living systems become analogized to machines (hearts as pumps, colons and bladders as sewerage systems, brains as computers, immune systems as military

refer to the 'animality' of cows. For example, local dairy farmers might say that a cow looks sad or is coughing 'like a Christian' (i.e. like a human being) when sick. They might find from the realm of human experience better tools to describe the behaviour, attitudes and conditions of cows than can be derived from the limited idea of animals as automata. My ethnography shows that the perception of dairy cows as animate objects in the environment might not be affected by the dominant way of describing them (Reed 1988b: 115). Local people might speak of their cows as machines, but they will still relate with them in the first place as animate objects in the environment which go through processes of 'transformational growth and non-repetitive motion' (Ingold 1988a: 12).

The scale of production and the individualisation of cows

I have shown that the ideology for sustaining a concept of dairy cows as machines might be dominant but it is not the only one. The reason for such dominance might reside in the fact that the concept of machine matches the ideal relation to domestic animals according to the logic of capitalist production, that is, as simple factors of production or entities to be manipulated like any other tool on a farm. Nevertheless, the practice of dairy farmers shows that the ultimate goal of the logic of capital is unattainable, i.e. animals cannot be reduced to inert machines. Having said that, certain trends can be found in local dairy farmers' practices that might reveal a process of increasing reification of domestic animals. To begin with, I shall focus on the relation between the scale of production and the adoption of a particular milking system, and the consequent effects on relations between milkers and milk cows. Then, I shall move on

organizations...)—thus reversing a much older tradition in many cultures in which the physical world too was regarded as if it were alive.' (Rose 1998: 19)

to explore the spreading practice of numbering cows instead of assigning to each of them a personal name—which is still done but was more common in the recent past.

In my earlier description of the milking routine, I mentioned that the milking parlour in a typical family dairy farm is laid out according to the so-called two stalls/unit abreast system. This milking system is known to allow for 'individual treatment' [*trato individual*] in the milker-cow relation, meaning that there is a chance for one-to-one contact between the milker and the animal. Among other features, the system allows milkers to tolerate, within limits, a cow's preference for a particular stall (e.g., far from the machine engine). Also, the quantity of concentrates given to a particular milked cow would depend on a milker's knowledge of its lactating cycle. For a novice milker the identification of individual animals is one of the most important and difficult tasks. A woman who started to milk three months before I met her¹⁸³ smiled as she told me,

I have just got to know the [24] cows. At the beginning all of them looked the same. I could not believe my husband and father-in-law were able to recognise them. I had to ask them how much concentrates should I give to a particular cow. I looked to her udder to know who she was. Later on, I managed to identify the udder with her face, and her name or number. At that time, I thought I would never get to know them. Now I do, but it was a great effort, though I always lived in the countryside¹⁸⁴.

¹⁸³ This woman was raised in a dairy farm. However, she had not carried on milking until she married a dairy farmer from the locality, after finishing a University degree in administration.

¹⁸⁴ Similarly, the udder was my prime focus of direct attention during my first stages of learning to milk. The reasons were threefold. First, knowing the form of an udder and teats makes it easier to attach teatcups. Second, I was asked to spread ointments on teats affected with chaps and this reinforced my visual and tactile attention on them. Third, manual milking is required before the attachment of the milking cluster and for a novice milker like myself this was a difficult task especially with the so-called 'hard cows'. Therefore, I started by focusing my attention on udders and teats, rather than on the cow as a whole. Significantly, a well-known veterinarian and university lecturer began a presentation on the importance of the milking routine for the good fortune of a dairy farm by saying: 'During the milking routine a milker will face foremost the teats of a cow. And the milking machine is his mediator'. However, the reduction of the animal to one of its parts seems to me only a first step in the learning process. On the contrary, the degree of expertise among milkers is manifested in their 'holistic' view of each and every dairy cow.

It should be mentioned that the expert milker does not push the novice to identify animals from the start. There seems to be an assumption that this knowledge arises with repetition, hence with more constant and intimate relations with animals. There is a good reason for that in the fact that a 'good' milk cow might live in a particular dairy farm for nine years or even more! Finally, in smaller *tambos* the different duration of milking for each cow does not place a practical constraint on an efficient milking routine.

By contrast, the predominant milking system in large dairy farms, the so-called 'herringbone' [*espina de pescado*] or any of its variations, is associated with milkers' 'collective treatment' of cows. In this system, cows enter the milking room in a more random fashion than in smaller *tambos*. Also it is more common to observe milkers exerting physical force to bring cows into the milking room. Moreover, the amount of concentrates is the same for all lactating cows. At least six dairy cows are milked simultaneously in a row (Plate 31). Although milkers might delay the detachment of the cluster from a very high-performance milk cow until its udder is fully emptied, the tendency is to standardise the duration of milking. Thus a 'hard cow' will probably be culled before others if its yield falls below average figures.

Certainly, each system responds to particular farm's needs. For larger herds, the collective system will be chosen to reduce the total duration of the milking routine (and to increase labour productivity). With this kind of 'collective treatment system' there is greater concern with the standardisation of cows' features and behaviour (e.g., udder size, duration of milking). On the other hand, the 'individual treatment system' affords a more intimate relation between milkers and animals, while the idiosyncrasies of

individual cows do not, as a rule, constrain the process of production. It seems, therefore, that the increase in the size of the milk herd, hence of the scale of the farm, might lead to a further estrangement between people and animals¹⁸⁵. In the same line of thought, Clutton-Brock writes,

Anyone who has [...] hand-milked a cow, knows that there are subtle differences of character in each animal. One cow will be restless and difficult to milk while another will be quite placid, and every animal shows a different response to the attentions of its human owner [...] But *it is inevitable that once the number of animals owned becomes large, say in the thousands, their individual identities are lost.* (Clutton-Brock 1994: 33-4, emphasis added)

My own observations confirm this view. However, two points need to be clarified. Firstly, Clutton-Brock seems to reserve human concern with the “personalities” of the individual animals’ (1994: 33) to non-mechanised farming. I have shown that the practice of mechanical milking of small herds might still make allowance for the personal character of dairy cows (I return to this below). Secondly, Clutton-Brock writes of ‘thousands’ of animals as the threshold at which the individual identities of domestic animals are lost. It is not clear what kind of domestic animals she had in mind. In the case of dairy cattle, the threshold might be lower than a hundred head. However, what is more important is that even in modern large-scale dairying there is indeed an interest in individual cows. The quantitative change in the scale of production has to be understood in association with a qualitative shift in farmers’ concern with animals, from the ‘personality’ of cows to their ‘individuality’, somehow analogous to the way in

¹⁸⁵ Galaty and Johnson include the increase in the number of head of cattle in pastoral systems under what they called the process of ‘intensification’:

‘[...] the broad process of pastoral change as part of a more general rural transformation, formal and informal, planned and unplanned, whereby animal numbers increase, technology supplements or replaces labor, and animals are perceived in terms of their commodity value, with an increasing share of production being directed to commercial sale.’ (1990: 27)

My own ethnography confirms the relations between these three factors: herd size, higher labour productivity, and the commodification of animals. However, these correlations are not mechanical but involve a more complex dynamic between imagined goals and real practices involving people and animals.

which, in modern society, the concept of the human person has been increasingly converted to the concept of the individual (Strathern in Ingold 1996c: 66). In other words, the concepts of animals and humans alike have gone from agency to reification. Certainly, the management of modern dairy cattle is based on detailed records of each cow. Yet in larger *tambos* the assessment of an individual cow is increasingly made without direct contact with the animal. Of course, the observations made by those who are engaged daily with milk cows (e.g., milkers and cowboys) are taken into account by a farm's decision-maker. At the end of the day, however, there is a separation between the animal itself and its recorded objective performance. The 'master's attentive gaze' is divided into two aspects: the 'real' animal within the environment and its quantitative, decontextualised representation. In most non-family dairy farms, these two aspects of cows correspond to an increasing technical division of labour, and there is a bias in favour of those who make decisions guided, mainly, by an evaluation of a cow's performance, as 'objectively' represented, rather than by the workers' direct knowledge of them.

The naming of cows

The trend towards the homogenisation, and potential reification, of dairy cows is also manifested in the way they are identified. According to my observations, there are two ways to identify dairy cows explicitly: by name and/or by a number attached to one of its ears¹⁸⁶. Naming dairy cows seems to be an old practice. Either on large ranches (Bouton 1961: 293) or on the smallholdings of peasant families (Sosa, Iusim and

¹⁸⁶ I am not considering here the marks stamped on the hide of an animal to indicate that it belongs to a particular farm, but only the identification of individual cows for dairy management.

Wettstein 1968: 34) children, mainly girls, were responsible for milking cows for domestic consumption, and they chose their names. Moreover, I was told that not too long ago, cows had individual names even in large non-family capitalist *tambos*. Nowadays, among family dairy farmers in Villa del Rosario, individual names are still used to recognise and call dairy cows. These names can be classified into five main groups according to: origin (where does the cow come from?), particular salient visible features, observed attitudes towards people, particular circumstances when introduced into the milk herd or its first milking, a link to a known person or fictional figure (see table 10).

Classification	Names (*)
Origin	Fumera, Fumerita, Raula, Estrella, Florida (4), Ramona, Mary, Micaela, Ricarda, Comadreja, la de Coquito, Solita, Astronauta, Italiana, Pepita, Perdomilla, Francisca.
Visual feature	Morocha (3), Negra (2), Negrita (3), Manca, Petiza (2), Blanca (2), Cardenilla, Huampuda (2), Huampita, Coruja, Manchita, Paloma (2), Pequeña (3), Gorda (2), Siberiana, Overa (2), Overa blanca, Rabona, la de la Caravana, Rayuna, Porota, Gaviota, Clarabella, Tetona, La Negra Grande, Chica, Mulata, Teta fina, Teta negra, Cola corta, La dura, Chiquita (2), Chueca, Cucaracha.
Attitude	Tronquito, Matrera, Mimosa (3), Laboriosa, Golosa, Zanguanga, Cagona, Loca, Encantada, Sargenta.
Circumstance	Tercera, La dos, Renqueta, Descaderada, Dominga.
Person	Crespa, Jacinta, Josefina, Popi, Macarena, Jesusa, Moni, Chita, La Tita, Luciana, Catalina, Marta, Vidala, Quina, Juanita, Nenita.

Table 10. Names of dairy cows

Note: (*) These names were collected from 11 surveyed family dairy farms.

Most given names are descriptive terms, referring mainly to such visible features as the colour of the hide (*Negra* [black]), the presence of horns (*Huampuda*), big teats (*Tetuda*), and so forth. The names which refer to a particular cow's attitude towards people might be related to its production as in *Laboriosa* [labourer], or in relation to its temperament as in *Loca* [mad], *Sargenta* [sergeant] or *Mimosa* [sensitive]. The names

that refer to particular circumstances when the cow was born or milked for the first time work as an *aide-memoire* for the biography of a particular cow on the farm: *Dominga* was born on Sunday; *Tercera* was the third female calf of its mother; *Descaderada* suffered from a permanent dislocation of its hip since its first calving. Finally, human names, though not necessarily representing 'real' persons, are transferred to cows in both categories of 'persons' and 'origins'. The former category includes names that are given due to a certain phenotypic or behavioural similarity between a cow and a particular person, who might be a neighbour (e.g., *Crespa*) or a member of the household (e.g., *Macarena*). Moreover, personal names might be given after TV characters or figures from comics, like *Josefina* or *Chita*, without any clear resemblance between the cows and the figures. On the other hand, those names of milk cows I have classified under the label of 'origins' might indicate peoples' concern with the genetic pedigree of milk cows. For instance, names like *Estrella* and *Astronauta* refer to a cow's female and male progenitor respectively. Moreover, some names are given in accordance with the geographical origin of the cow, as in *Florida*— i.e. from the province of Florida, a well-known dairying region. More interesting are those names that show the mediating role of animals in the constitution of social relations between people. For example, *Raula* meant that its mother was artificially bred by a local vet. Furthermore, names like *Fumera*, *Comadreja*, and *Perdomilla* speak of who had raised them until they were sold to the current owner. In this latter case the particularities of milk cows as commodities, to be bought and sold in the market, are brought more clearly into focus.

As I mentioned in chapter 3, local dairy farmers might purchase milk cows, if they need them, from neighbours, local and regional specialised breeders, or in cattle auctions.

According to my observations, farmers might first look for cows on other dairy farms in the zone. A particular dairy farmer might comment to his/her neighbours and known technicians that he/she is looking for a new dairy cow. Neighbours could advise, or just spread the news around. At the same time, for various reasons, other dairy farmers might sell part of their herds¹⁸⁷. This contingent coincidence of interests between buyer and seller might result in a transaction if both parties agree on the price and method of payment, assuming of course that the buyer is satisfied with the good sanitary conditions and productive skills of the traded cow. On the other hand, some local dairy farmers have gained a certain reputation as breeders and have developed this specialisation as another source of income. Consequently, dairy farmers know they might have heifers for sale, which are lactating or nearly due. Moreover, these local breeders 'advertise' their cows through their social networks¹⁸⁸. Certainly, dairy farmers are more confident about the qualities of a milk cow bought from a neighbour or a local breeder, not only based on previous experience concerning productivity, but also because a more transparent relationship is assumed between transactors. As an informant put it: *'A neighbour, though a self-interested partner, might not sell you a tricky animal'*. I have no empirical evidence that might contradict this informal rule. Yet, drawing some parallels with other situations¹⁸⁹, I would suggest that even where a dairy farmer received a 'bad' cow, he/she would be unlikely to make an explicit charge.

¹⁸⁷ The main reasons I recorded in my fieldwork are a household's need for cash to pay debts, the need to reduce the milk herd due to shortage of forage, a partial or total shift in the orientation of production on the farm, or the bankruptcy of the dairy farm.

¹⁸⁸ For example, one of these breeders used to inform the local veterinarian on the actual or future availability of new lactating heifers and the latter communicated the news to other dairy farmers while visiting them. This breeder offered his heifers up until three days after calving and if they were not sold he included them in his own milk herd. He explained that after three days heifers needed to be tamed for milking, but that this *'training cannot be included in the selling price'*.

Probably, he/she would consider whether to get involved in transactions with the previous seller again and, moreover, the spread of rumours against the latter might be a means to reap at least a moral reward.

Having failed to find milk cows among local neighbours or a breeder, a prospective buyer might look at the cattle market or *feria de ganado*. The *feria* for family dairy farmers is located in the town of San Ramón, where Co-op members commonly receive financial facilities to buy milk cows (e.g., with a period of three years to cancel the debt). In the cattle auction, the personal relation between buyer and seller is increasingly lost. Those dairy farmers who come to the market-place to buy animals normally walk around the exhibition stalls [*mangas*] looking at cows and calves. They consider the potential performance and temperament of cows according, mostly, to their visible features. It is common, though not necessary, that the owner of a cow or herd might informally advertise his/her cattle by standing next to them while answering any questions. Then, during the auction, dairy farmers will put forward their offers for chosen animals¹⁹⁰. Sometimes, while an animal is exhibited in the main arena, the auctioneer [*martillero*] might mention the name of the owner together with a commonly exaggerated depiction of the animal's capabilities and conditions. Consequently, the audience might know the farmer, which may or may not increase their confidence.

¹⁸⁹ For instance, on a dairy farm a neighbour was contracted for baling hay. When the rolls were opened to feed cattle a couple of months later they were partially rotten, and consequently useless. The service provider had not waited long enough for the harvested hay to dry. The farmer did not raise any claim, though he was manifestly angry and disappointed.

¹⁹⁰ The hazard involved in the purchase of a cow in cattle auctions was clearly manifested on one occasion when I visited the market place with a couple of local dairy farmers. One of the cows they had decided to bid for, while touring the stalls, came to the central yard. Surrounded by around a hundred onlookers and the amplified voice of the auctioneer it reacted unexpectedly, attacking the workers in the yard and those people who were standing next to the fence. Despite the auctioneer's efforts to explain that this was an exceptional circumstance but that the cow was nevertheless tame, the final price paid for it went down to less than half the average. The animal was taken out from the central arena by horsemen with violent whipping, while the audience was still laughing and commenting on the event.

Finally, dairy farmers might also look to buy cows from well-reputed specialised breeding farms, so-called *cabañas*. Normally, the price of a cow from a *cabañas* is higher than is general in the locality. Yet, there is a commonsense rule which states that knowing where the animal comes from, and consequently who raised it, acts as a certain warranty of future performance on the dairy farm.

Underlying all these mechanisms for purchasing a dairy cow is a dialectical interplay between person/person and person/animal relations. Interpersonal knowledge will mediate the initial relation between a farmer and his new cow, while later on the animal will mediate the relation between persons. This latter movement might be expressed in the naming of cows after the seller or provider. Having said that, there seem to be no further social obligations between sellers and buyers after the commercial transaction has been concluded. Thus, I would not include this kind of mediation under the anthropological concept of socio-economic reciprocity (Sahlins 1972). Reciprocal exchange of goods between people generally occurs in situations in which interpersonal relations continue through time, sometimes even across generations, mediated by a material object (Lambek 1990). This is not the case with dairy cows among family and non-family farmers in Uruguay. Thus the dairy cow is a commodity that nevertheless retains the stamp of the person or persons who raised it. Each cow embodies its previous relations to those who took care of it. However, after a transaction has been concluded in the market the new owner will substitute his own personal touch for the previous one. The use value of such a living commodity is continually transformed, ameliorated or impoverished, but it does not represent an accumulation of 'personhoods', because the animal is detached from the historical flow of previous social relations as soon as it becomes owned by another producer. Having said that, in

some cases people might know a long 'genealogy' embodied in an animal, its full biography, but only if the breeder and farmers who are related to the life of this animal have significant reputations. Furthermore, I believe that with the increasing importance attributed to dairy-cattle genetics, the biography of a particular animal has become more focused on the source of its genes (i.e. the living or dead bull, and the cow's mother) (see Fussell 1966: 32) rather than on those human beings who, as constituents of the cow's environment, have helped to develop its phenotype. In other words, there is a tendency to see a dairy cow as existing in isolation from its caretakers.

Another important point about naming dairy cows relates to the relative proximity of these animals to the household, and consequently to the realm of human social relations. I would suggest that naming a milk cow is a way to initiate it into the milking herd, hence into the group of animals more proximal to the household. It is no coincidence that milk cows, together with other tamed animals like dogs, cats, horses, and oxen, all have personal names (see D. Harris 1996: 452). They are considered to be closer to the family, unlike pigs, beef cattle and fowl. Moreover, milk cows, as well as animals of the aforementioned species, are 'inedible' at the household level. Sahlins (1976) has pointed out, for the United States of North America, that a domestic animal's possession of a personal name correlates with its classification as inedible. Thus he proposes the following principle: 'named/unnamed: inedible/edible . Edibility, he observes, 'is inversely related to humanity' (1976: 174-5). This principle seems to coincide with local dairy farmers' practice. Consequently, milk cows are regarded as having something substantially in common with humans. Nevertheless, milk cows, oxen and, sometimes even horses, might be sold to a slaughter-house. Hence, they might become 'edible', but not for the household itself. As soon as a dairy cow leaves the

farm, the relation of affinity is cut off and the animal acquires the status of an object vis-à-vis human subjects (Sahlins 1976: 174).

As the size of the milk herd increases, dairy farmers in both family and non-family farms replace cow's names with ear labels that carry numbers. Only exceptional cows will be named, due to their remarkable (positive or negative) characteristics. I cannot give a definitive answer to the question of why numbers are chosen instead of names, apart from the obvious reasons that it is easier to write a number down on the label, to sort written records, and to read the number at a distance. Yet I would suggest that ear labels with numbers are not only material artefacts but also work as symbols of modernisation and the rationalisation of production. Thus, numbering becomes a practice associated with the self-definition of farmers as modern producers. It is worth noting that most family dairy farmers (of any sex and age) were initially reluctant to tell me the names of their cows. They looked somehow ashamed. Naming dairy cows seemed to be a sign of backwardness. Is it also felt to be backward to have more personal and affective attitudes towards these animals? The answer might be positive. Yet, what also seems to be true is that the rationalisation of milk production requires a greater emotional detachment of people from their cows because the latter might need to be culled according to a more objective cost-benefit analysis. A cow that is numbered rather than named seems more like an object, something that can be more easily disposed of.

Conclusions

The case of dairy farming under study shows that the development of particular relations between milkers and dairy cows calls for particular relations between family members and between a boss and waged workers. I am not suggesting that we should conclude from this that the construction of a more just human society must begin by forcing a different relation with animals, although I believe that this is the underlying assumption of many animal rights movements (see Maehle 1994, for an historical review of such ideas in Western philosophy). My contention is that both domains cannot be taken as given, on separate levels of existence, but rather that they are part and parcel of the same reality. Dairy farmers do not show a unique or singular attitude towards the non-human environment; rather, their attitude changes according to the practical meanings that different animals and plants afford them in their daily lives. The same might be said about relations between people.

I have shown that a tension between principles of trust and domination underlies the relations between milkers and milk cows, and that this might be exacerbated with the increase in the scale of production under the current capitalist mode of production. Nevertheless, contrary to common depictions of industrial farming, my ethnography presents a different scenario where humans and domestic animals still engage with each other in daily life. This, in turn, leads to the ambivalent representations of dairy cows as simultaneously automata and creative beings.

In short, I contend that *Canarios* dairy farmers are not alienated from their dairy cows, because the achievement of people's goals requires the 'attentive gaze' of humans towards animals, a relation that encompasses the perceptual skills necessary to interact with animals in ever-changing situations. The human domination of domestic animals

in modern dairy farming does not transform the latter into organic machines, but rather aims to narrow the degree of animals' freedom to transform the environment. Until now, there seems to have been enough room, both practically and symbolically, to continue this trend.

On the other hand, the future characteristics of human-animal relations will continue to be greatly influenced by the degree of freedom of dairy farmers and waged workers to decide how to shape the environment, including both animals and humans, in order to satisfy their needs. The governing short-term goal of profit maximisation has meant fewer alternatives for people in this respect, though there is no certainty that this trend will not eventually hit up against social and ecological constraints. Perhaps the increasing reification of dairy cows will become a symptom that things are not satisfactory in the realm of human sociality. Nevertheless, as I was told on several occasions: *'What is urgent is an obstacle to those things that might be more important'*. Moreover today, *Canarios* dairy farmers do separate the domains of human society and nature. Their main concern is to improve the human domain, and the relations to non-human 'others' are just means to achieve this. In this sense, it could be said that there is an estrangement between men and domestic animals, between 'society' and 'nature'.

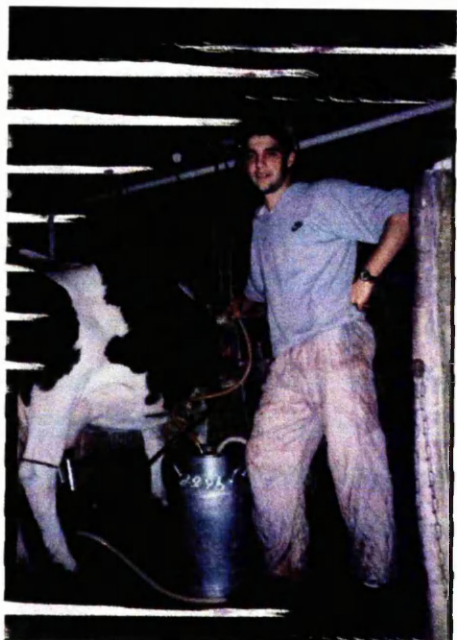


Plate 26. Milking in a small parlour.

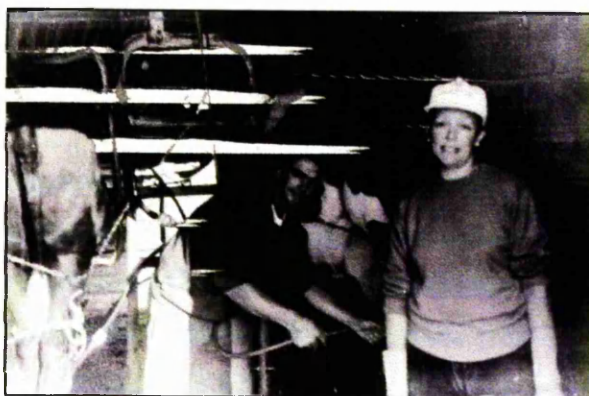


Plate 27. Washing udders of cows in an abreast milking parlour.



Plate 28. Waged milkers into a trench of an herringbone style parlour.



Plate 29. Feeding cows with stems of sugar beet.

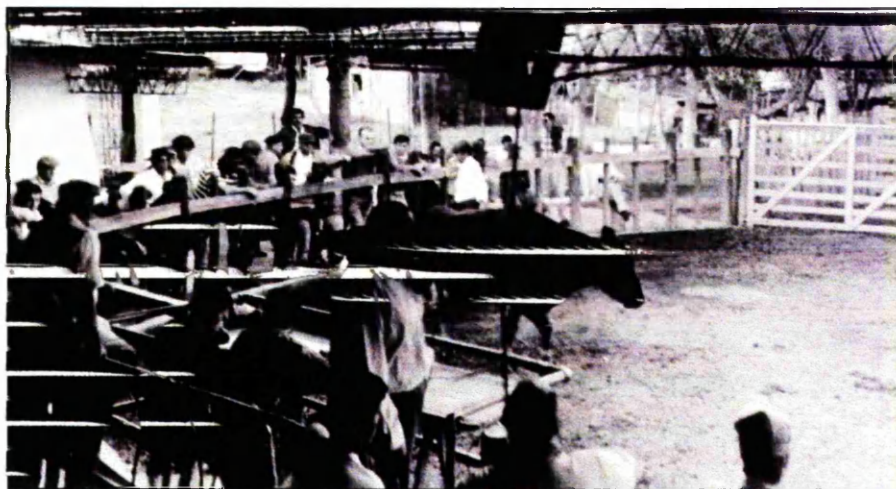


Plate 30. Cattle market



Plate 31. Lactating cows in a large milking parlour.

Chapter 7. Conclusions

In a recent article, Ingold (1996a) argues for the embeddedness of economic and working practices in the social life of those, like modern farmers, who make a living from their direct contact with plants and animals. In his conclusion, he emphatically remarked:

There is far more to gardening than the mere production of food, just as there is more to a song than the production of notes. If food were the only object of people's activities, there would perhaps be no need for magic. But for practitioners, *growing crops and raising animals are not just ways of producing food; they are forms of life.* (Ingold 1996a: 24; emphasis added)

On the other hand, in the early 1980s, a New Zealand expert on milk production concluded his analysis of the trends in modern dairying as follows:

The successful dairy farmer has increasingly to view the farm business as a whole and to make decisions on how best to use the resources available to him (land, labour and capital). It may seem unfortunate that *milk production is becoming more of a business and less of a way of life*; however, whatever the rights or wrongs, this evolution is unlikely to be reversed. Much of the mystique associated with breeding better cattle, with feeding for higher milk yields and with stockmanship, is increasingly open to scientific evaluation, and as a consequence milk production is becoming more of a science and less of an art. (Leaver 1983: 165; emphasis added)

This dissertation has shown that these two apparently opposed perspectives might not be exclusive, but rather both help to explain the current livelihoods of *Canarios* dairy farmers in Villa del Rosario, and particularly the changes in local people's practices and attitudes towards the non-human components of their environments. My argument has been that *Canarios* dairy farmers do engage creatively with the physical environment, non-human animals, cultigens and other plants. They are outstanding agents in the unfolding of new environmental affordances resulting from their daily efforts to keep the household estates on track. Indeed, although science has become embodied in

people's thinking and technological usage, this fact did not transform the men and women I worked with into simple executors of decontextualised techniques and knowledge. Rather they continue to play a creative role in coping with market requirements and understand how things should be done according to their particular ecological and social contexts. In other words, modern dairying is a way of life for the *Canarios*, informed by their continuous engagement with the natural and social environment and, moreover, their continuous revaluation of their place as producers and citizens at local, national and regional levels.

I have also demonstrated, however, that the possibility of local people developing the full potential of their practical creativity to transform the material world has become increasingly constrained due to the economic and political disempowerment of family farmers in Uruguay over the last three decades, under the current hegemonic neoliberal model of 'social' development. In this sense, people's experiences of their working practices and hence their relations to animals, cultigens, plants, the weather and so forth, seem to have become consigned to a realm of their life disembedded from sociality, family relations, and the neighbourhood. Expressing a dominant bourgeois ideology, science and management have become central to production while sensuality and sentimentality are reserved for non-profitable activities or consumption (Ellen 1996a: 10).

In the first of the core chapters of this thesis I analysed the economic, social and political processes that have led to the reconversion of a group of former crop farmers to modern dairy farming in the area of Villa del Rosario. The aim of the chapter was to show the mutual constitution of the social and the natural realms, and how this co-

evolution has worked as a background for understanding the present way of life of *Canarios* dairy farmers. I concluded that human agency has become the fundamental living force in the shaping of ecological relations. Certainly, the role played by other living and non-living forces in transforming the environment and, dialectically, their influence on the evolution of social life, is not negligible. Nevertheless, the social arrangements and practical activities produced and reproduced in daily life by local people have gained temporary predominance in guiding, though never completely, the effects of those other forces. Moreover, conflicts between interested-groups at national and local levels have had an enormous bearing on the particular form of relatedness of each person, family and community towards other species of animals, plants and the physical constituents of the environment. The alternation of success and failure in the use of these manifold constituents for the satisfaction of changing human needs in particular historical periods is, I argue, responsible for the currently ambivalent conception among local people of the social realm as a part of the total web of life, though still estranged from it.

Having presented the process by which a group of local farmers adopted dairy farming as a principal strategy to make a livelihood since the late 1980s, in chapter 3 I moved to the depiction of the technical and social aspects of modern dairy farming as developed in the catchment area of Villa del Rosario. The emphasis was placed on the application of modern agricultural technologies both for growing forage crops and for raising dairy livestock, and their effects on the organisation of labour on the farms and in the locality. Conversely, it was shown how changes in gender and generational divisions of labour, inter-household co-operation, and the engagement of local farmers in both commodified and non-commodified labour relations, have influenced the way agricultural techniques

and technologies have been locally produced and used. Moreover, these changes were contextualised in a wider process of economic and social change in rural Uruguay, particularly the increasing importance of the strong vertical integration of family and non-family dairy farms into agro-industry, represented in this case study by the Dairy Co-op *Conaprole*, and the relative narrowing of local farmers' autonomy in decision-making at the farm level. I showed that the technical and social domains are intimately interwoven and synergistically constituted. Indeed, the current use of technologies embodies particular social relations and, conversely, these social relations embody a particular kind of technology. Thus the trend towards the individualisation of family farms vis-à-vis the Co-op and other farmers is one of the most salient consequences of the increasing mechanisation and industrialisation of agricultural practices.

From chapter 4 onwards, I turned my attention to the day-to-day life of dairy farmers and the emergent practical and symbolic meanings of places, time, machines and animals, depicting the dialectical movement between alienation from, and engagement with, the natural and social environments. Chapter 4 was devoted to the evolving meanings of places among *Canarios*, and the links between emplaced practices and the symbolic construction of more abstract spaces. After presenting the recent changes in the materiality of nested places, from the residential house to 'the zone', it was concluded that dairy farmers and other rural dwellers have been active in modifying both their physical habitats and their social networks. Hence, the cultural meanings of local places arise through the mutual transformation of persons and environments. Moreover, it was shown that people move practically and conceptually between places, hence continually changing their boundaries. I explained the significance of new ways of using tools and machines, as well as the influence of transport and communications

technologies on farmers' patterns of movement within and beyond their farms, and consequently the rise of different ways of perceiving the environment according to access to the means of labour, transport and communication. Regarding the dialectics of engagement/detachment between dairy farmers and their surroundings, the most significant changes were threefold. The first was an increasing conceptualisation of dairy farms as integral units of productive and economic space. The second was the inclusion of rural and urban areas as parts of the same experiential zone. The appropriation of urban space and 'urban culture' by local people, I argued, tends to reinforce a reified notion of 'nature' among farmers, as something that can be enjoyed or even consumed. Nevertheless, the meaning of 'the rural' as a place and a topology that affords agricultural production and hence the material substance to reproduce the social identity of settled rural producers is still dominant. The third change, as regards the dialectics of engagement/detachment, lies in people's growing awareness of their participation in a 'globalised' though still locally mediated world. I distinguished between two types of relations, those between places (i.e. settings of situated practices), and those between spaces (i.e. abstracted configurations of territories). On the one hand, people might think of their practical environment as a detached space, even though their consciousness is still anchored in their first-hand perception of the world, and is constantly reassessed in a dialectical process of engagement and detachment, where local and decontextualised forms of knowledge have a relatively symmetrical relation. On the other hand, there is another notion of space represented by the nation-state and the regional market, which is to some degree imposed upon the lived world of local people by outside decision-makers. These abstracted spaces are seen as alien to local sociality, and as entities with their own life that can act against the local community.

In chapter 5, I analysed the attitudes of the *Canarios* towards time, centred in the perception of environmental events framed by the rhythms of the daily and seasonal cycles of activities. The changing nature of people's sense of time and, moreover, the present tension between two kinds of temporalities, were described. On the one hand, I identified those daily and annual activities that might help to generate a sense of task-oriented time constituted through the tuning of farmers to the rhythms of natural and social events at the local level. The salient time-markers were the alternation of daylight and night-dusk which is strongly related to the cattle-clock, constituted by the mutual involvement of dairy cows with adult dairy farmers and vice versa; meal-times, especially lunch time, with its characteristic of marking the middle of the day for a family gathering; and the seasonal variations of the weather with which farmers have to resonate if they are to succeed in their agricultural practices. I also emphasised that the sequence of working and non-working activities among family dairy farmers has been changing dramatically for the last two decades, due to the artificial lighting, the possibility of storing milk produced on the farm, the intensification and mechanisation of agriculture and the secularisation of people's attitudes towards the process of production. Yet, besides these changes, most sequences of activities continue to inscribe a qualitative rather than a quantitative sense of time in the subjectivity of local people. On the other hand, the attendance of children and teenagers at educational institutions, the widespread application for, and use of, loans to reproduce the household estate, and the presence of a more homogeneous distribution of working tasks throughout the year, have all led to a notion of time increasingly abstracted from local conditions. Moreover, the hegemonic ideological construct that discriminates between work-time and leisure time— corresponding to clock-time and social-time

respectively—is used by local dairy farmers to assess their current task-oriented rhythms of activities. The result has been people's conscious objectification of their temporality and, very often, negative evaluation of it. The way dairy farmers cope with the tension between task-oriented time and clock-time is informed mainly by a 'technological fix', defined as 'the solution of a complex social problem through technological as opposed to other means' (Brey 1999: 160). Nevertheless, individual attempts are made to reembed time in its social matrix, through the establishment of relations with those persons who might have a certain control over commodity-time, namely technicians and bureaucrats of the farmers' association. It seems, however, that the trend towards conceiving of time as an alienated entity has not been counteracted. Finally, I suggested that an anthropology concerned with human perceptions of events and attitudes towards time in either industrial or industrialising societies should be attentive to the relational movement of the different constituents of people's environment and the resulting complex interweaving of different temporalities, without neglecting the underlying social struggle carried on by persons and groups to resolve the tensions between task-oriented and clock-oriented perspectives on time.

Chapter 6 returned to the built environment of the dairy farm, and more precisely to the milking parlour. Taking the milking routine as the most salient example of an activity system on a typical dairy farm, I studied the interfaces between machines, dairy cows and milkers. In the first part of the chapter, I described how the introduction of mechanical milking had led to the development of new embodied skills, with the emphasis on the mutuality between the working environment and milkers' perceptual systems. The main conclusion of this part was that gathering milk on a modern family dairy farm should not be seen as a machine-centred process but rather as a labour-

centred one. Thus, *Canarios* dairy farmers have passed through an enskillment process rather than experiencing the alienation of their embodied capabilities. Human embodied skills are still central to the efficient production of milk which was characterised, following Pye's (1995) definition, as guided by the principle of 'workmanship of risk'. I argued that mechanical milking in Villa del Rosario embodies a theory of the human beings that must carry out the milking, informed by the continual manual and intellectual enskillment of milkers. These skills include, among others, the maintenance of milking machines, the prevention of the pollution of milk, and the building up of co-operative relations towards both fellow milkers and dairy cows. I also showed that a certain visual bias embedded in the design and use of milking machines has not meant a one-sided trend towards a 'visualist' mode of relating to the material world. Having stressed that the practice of mechanical milking brought about no radical technical alienation, my conclusions nevertheless leave unanswered the question of what would have happened to the milkers' embodied skills had they been historically replaced by machines.

The second part of chapter 6 was devoted to the analysis of relations between human and domestic animals, centred on the engagement of milkers with milk cows and the metaphors used to talk about them. I showed that, underlying the relations between milkers and milk cows, there is a tension between the principles of trust and domination, which in many ways resonates homologically with a tension found among the people themselves. This tension informs the ambivalent perception of cows as both machine-like beings and creative agents. Moreover the increase in the scale of production, the technical division of labour, and the goal of maximisation of profit were identified as causes for the development of a rather estranged attitude towards milk

cows. The intimate relations between humans and animals which was found, in general, in small-scale dairying is practically replaced, in larger *tambos* by 'scientific' management. The effects of this rationalisation of production might turn the living animality of cows into abstract individuality, a process that stands in a homologous relation to the observed trend towards the individualisation of waged milkers in the context of more developed capitalist relations of production. Finally, I concluded that, despite certain symbolic constructions that integrate both machines and domestic animals within a unique man-made world, there seems nevertheless to be a separation of domains, i.e. between society and nature. *Canarios* farmers' current ideas of how to improve the human domain seem to place the non-human 'others' on the side of lifeless instruments to promote the development of individual rural enterprises. In this sense, it could be said that there is an estrangement between farmers and domestic animals, between society and nature. I would suggest that, given current social and economic trends in the modernisation of agriculture as experienced in southern Uruguay, which show an increasing social marginalisation of poorer farmers, *Canarios* dairy farmers are impelled to develop such a dichotomous view (and practice) towards the environment in general, and towards domestic animals in particular.

My portrayal of *Canarios* livelihoods, and of their perceptions of and attitudes towards the natural environment, has required a historical approach to understanding how things came to be as they are. For instance, I have shown that the process of modernisation of rural livelihoods in southern Uruguay, since the end of the 19th century, cannot be depicted as an evolutionary movement of increasing alienation of social life from the rhythms of the non-human environment. This movement has indeed been informed by the dynamics of engagement and estrangement, both in practice and symbolically,

between human society and the non-human components of the environment. The same kind of relation underlies the constitution of sociality between human agents. Moreover, I argue that there has not just been one way of modernisation—and consequently only one way to relate to the natural environment—but many, throughout the time since the first Europeans settled in the Villa del Rosario area at the turn of the 20th century. Therefore, one of the contributions of this thesis to the anthropological study of society-nature relations might be the awareness that any study of the present human experience *with*, and symbolic representations *of*, non-human components of the environment cannot avoid the analysis of the impact of the capitalist modernisation of the process of production and the commodification of the general livelihood of local people. On the other hand, it must address the different forms that this general trend towards modernisation has acquired as the result of previous historical developments anchored in local specificities, as well as the current ability of different social groups, families and persons to shape, in contradictory ways, their own forms of life.

The relation of *Canarios* dairy farmers with non-human components of the environment is finely balanced between engagement and detachment. This conclusion seems to raise a theoretical contradiction between the principle of direct perception of environmental affordances and the possibility that a community of practitioners might set themselves above and beyond the material world. I believe that the resolution of this conceptual contradiction is to be found in the current praxis of local farmers within the dominant logic of the capitalist mode of production, and not in the existence of a universal symbolic separation between culture and nature (Ellen 1996a: 30). In fact, the seemingly antagonistic relation between, on the one hand, the enskillment of farmers brought about by dairy farming to cope with the natural and social environments, and,

on the other hand, the trends towards the estrangement of individual families from other persons and social organisations, places, events and domestic animals, says much about the current irrationality of the kind of modernisation experienced by local farmers in general, and family dairy farmers in particular. At the same time that dairy farmers have enriched their relations with the social and natural environments, farmers have lost ground in deciding what, how, and when to put to creative use their knowledge of the environment, according to their personal, familiar and collective needs, as well as their accumulated experience.

As this case study shows, social anthropologists dealing with the relations between experience and symbolic representations of the world should be ready to observe, describe and analyse different and frequently ambivalent perceptions of the environment. These ambivalences are rooted in the different modes of practical engagement with the material world, and in the particular positions of persons, families and groups in a social structure that is synergistically related with that world. This social structure should not be understood as a static scenario where people just perform their roles, but rather as the emerging network of relations between people, unfolding through their own conscious actions in relation to other persons and non-human components of the environment. These conscious actions are constrained by the material, social and ideological configurations of the lived world as shaped by previous generations and the current interplay of interested social groups.

Another important lesson to be extracted from this study is that the traditional division between Western and non-Western ways of relating to the natural environment should be qualified, since a group of 'non-Westerners'—assuming that Uruguayans would not

normally be classified as Westerners by Western standards—might hold many of the supposed ideas about nature and society commonly attributed to Western culture. Thus, they might hold that the social and the natural are external to one another, though ‘the indicative content of that natural other may vary’ (Ellen 1996a: 7). Mintz (2000: 169) has argued that the greater frequency and velocity of the movement of people, capital, goods and ideas across political boundaries has drained the Western/non-Western distinction of any significance. Indeed, the same seems to be true of every kind of essentialist and ahistorical definition of society, culture, cognitive model or symbolic configuration. This is not to deny that lines of distinction have to be drawn if we are to reach a scientific understanding of social life. However, as should be clear by now, any analytical classification needs to be placed in its proper context and may possess only a temporary validation. Admittedly, I am unable to propose an alternative to the Western/non-Western distinction; however my case study does point to the need to consider social differences within nation-states and local communities, rather than lumping together all these differences on one side or the other of a master dichotomy between the Western and the non-Western.

One of the most salient features of the modernisation process, as described in this work, has been the continual change in technological systems adopted by family farmers for growing crops and cattle raising. I have shown that the reconversion of former crop farmers to dairy farming has brought about significant changes in daily life both on the farms and beyond them. While it is important to see the de-contextualised production of most dairying technologies as embodying biased modes of engagement with both natural and social environments, this embodied ‘worldmanipulation’ leaves space for people’s own interpretations of the use and reshape of technology in particular settings.

Technology is part of society, not outside of it. The analysis of technological systems should therefore focus on the combination of the material features of technologies, including their current and potential impacts on the biophysical environment, their integration into the network of social relations, and the ways they constrain, and are constrained by, this integration.

In terms of research methodology, my study has shown the power of fieldwork as a tool to apprehend the dynamics of daily life, through the systematic and open-ended recording of the practices and discourses of the people among whom we work, without neglecting the observation of animals, plants and the natural physical forces as implicated in people's past and present actions. Moreover, I suggest that the research technique of 'artifactual apprenticeship' is of central importance for scholars who want to conduct research in the field of the anthropology of techniques and technologies, particularly with reference to the evolution of society-nature relations.

It has been very far from my intention to suggest that local people in Villa del Rosario are afflicted by a kind of 'false consciousness' that prevents them from seeing the truth about how their social and ecological relations are constituted, and thus from seeking alternative livelihoods. Indeed, throughout this dissertation, their voices have appeared to show an increasing 'penetration' (Willis 1977) into the causes and consequences of their current circumstances. Yet peoples' agency is constituted in particular contexts in which both social and ecological relations, resulting from previous activity, place tight limits on the scope of personal and collective action. The adoption of modern agricultural technologies by local family dairy farmers did not lead to the alienation of people from the natural environment due to their intrinsic materiality, form and

features. It is rather the national and international institutional network, which mediates both the current use of technologies and the access to the non-human environment, that should be regarded as the prime cause of the increasing separation, in local conceptions, between society and nature. In short, the ultimate sources of alienation are not to be found in the daily work of the farmer, household or work-team, or in the use of modern technologies, but rather in the complex social mediation between person and environment, expressed in the social division of labour, agribusiness integration, centralised politics and the current uneven dependence on globalised markets.

Appendices

Appendix A. Semi-structured questionnaire to dairy farmers

Proyecto: Tecnología y percepción ambiental 1997/1998

Entrevistas en profundidad a productores lecheros

Nº de referencia

Fecha: __/__/__

I) DATOS PERSONALES

1) Nombre del entrevistado: _____

2) Ubicación del predio

Ruta_____ Km_____

Localidad_____

Rurancel_____

Sec. Policial_____

3) ¿Residen en el predio?

Si

No ¿Dónde? _____

II) COMPOSICION FAMILIAR

	Edad	Sexo	Educación formal	Reside en predio	Actividad extrapredial (explicitar)
Productor					
Conyuge					
Hijo					
Hijo					
Hijo					
Hijo					
Hijo					
Hijo					
Otro_____					
Otro_____					

¿Participa de alguna organización social?

IV) TENENCIA Y SUPERFICIE

¿Qué superficie dispone en...?

Cuadras
Hectáreas

¿Cuál es el origen de la tierra?

¿Quién es el titular? _____

V) USO DEL SUELO

ATENCION: DISEÑAR EL PREDIO

VI) RUBROS PRODUCTIVOS

364

VII) ALIMENTACION

	Producen	Compran		Producen	Compran
Carne Vacuna			Frutas		
Carne Ovina			Leche		
Carne Aves			Huevos		
Carne Porcina			Pan		
Verduras de hojas			Fideos		
Tonates			Otros		
Papa, boñiato			Otros		
Zapallo, zapallitos					

VIII) CURSOS DE CAPACITACION

	Fecha	Quién	Dónde	Comentarios
Manejo de tambo				
Fabricación de prod. lacteos				
Inseminación artificial				
Producción de cerdos/aves				
Elaboración de conservas				

IX) APRENDIZAJE DEL TAMBO

	jefe varón/ mujer	conyu- gue	hijo/a	hijo/a	hijo/a	hijo/a	otro
Veterinario							
Ing. Agrónomo							
Otro técnico							
Familia							
Vecinos							
Cursos grupales							
CONAPROLE							
Otros							

X) TRABAJO FAMILIAR EN EL PREDIO (división sexual del trabajo)

Actividades de agricultura

	jefe varón mujer	conyu- gue	hijo/a	hijo/a	hijo/a	hijo/a	otro	otro
Labores y siembra								
Carpir o funigar								
Cosecha								
Silo y almacenaje								

XI) Actividades de tambo prop. dicho

	jefe varón mujer	conyu- gue	hijo/a	hijo/a	hijo/a	hijo/a	otro	otro
manejo								
ganado								
ordeño								
limpieza								
tambo								
limpieza								
tanque								
traslado								
leche								
elaboración								
queso								
participar								
grupos								
Otras								

XII) RODEO LECHERO Y NOMBRES DE VACAS

en Ordeño	
Secas	
Otras categorías	

XIII) CONTRATACION DE PERSONAL

Si		No			
		Forma		Cantidad de	
		zafral	perman.	jornadas al año	Rubro y tareas
Capataz					
Peón especializado					
Peón común					
Otro.....					

XIIIb) INSTRUMENTOS DE TRABAJO

Instrumento	Año compra	Prop	Origen	Cómo lo adquirió	12
Máquina de ordeño					
Tanque de frío					
Tractor					
Bueyes/Caballo					
Ensiladora					
Zorra					
Rastra					
Sembradora					
Cosechadora					
Enfardadora					
Ensiladora					
Zorra					
Equipo de riego					
Camión					
Camioneta/Auto					
Otra					

XIV) INFRAESTRUCTURA DOMESTICA

Energía	UTE	Calafón	Gas/UTE
	Grupo electrógeno		Leña/Ale
	Cargador de batería		Freezer
	Feroces gas/kerosene		Lavarropa
Agua	Instalación		Televisor
	Refrigerador		C
Electro- domésticos	Cocina		B/N
	Gas/UTE		Video
	Leña		Rurancel
	Otra		Computadora
			Radio

XV) MEDIOS DE TRANSPORTE

	trabajo	compras	recrea- ción	frecuen- cia	Destino	Dificultades
caminar						
caballo						
bicicleta						
moto						
auto						
ómnibus						
tren						
barco						
avión						
carro						

XVI) INFORMACION

	¿Cuáles?	Quiénes	Veces por semana
Diarios			
Revistas			
Libros			
Folletos			
Boletines			
Radio			
Televisión			

XVII) PROBLEMAS AMBIENTALES

problemas	detalles	responsable	solución
erosión de suelos			
clima			
agua contaminada			
extinción de especies			
plagas			
otro (bosta) _____			
otro _____			

XVIII) OBSERVACIONES GENERALES:

¿Cuál ha sido el mayor cambio con la lechería?

Para Ud. y su familia

Para la zona

Appendix B. Land tenure in official lands, Villa del Rosario 1951-1999.

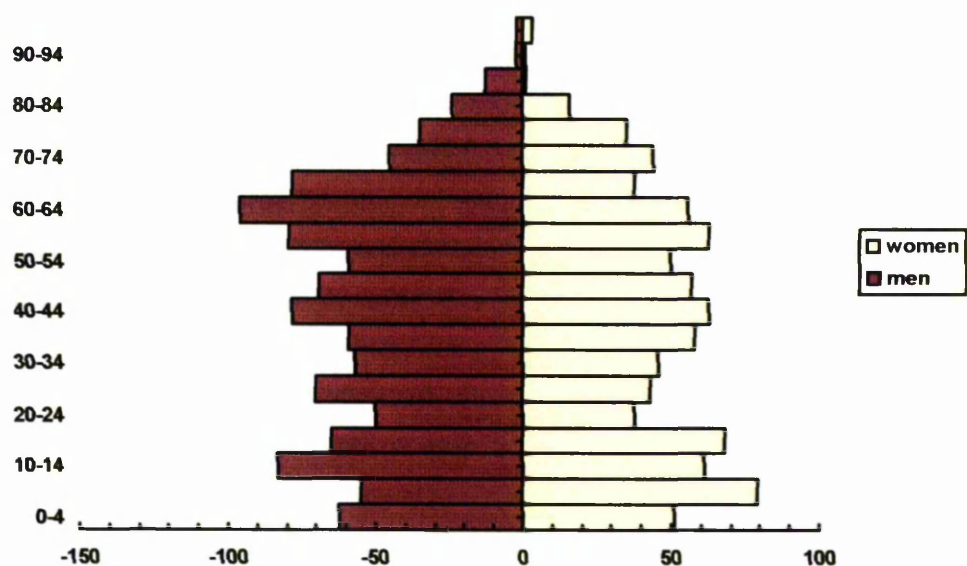
Colony number	Plot number	Year of			Colony number	Plot number	Year of		
		Leasing	Agreement for buying	Buying			Leasing	Agreement	Buying
396	1	1951*	1969	1983	560	1	1976		
	2	1951				2	1976		
		1966	1969	1996			1980		
	3	1951	1969				1994e		
			1993			3	1976		
				1994a			1981		
	4	1951				4	1976		
		1966	1969				1997		
			1980			5	1976		
			1992				1985		
	5	1951	1969	1992			1986d		
				1992a		6	1976		
	6	1951					1981		
		1955					1990		
			1978	1992b			1995g		
	7	1951				7	1976		
		1956					1979		
		1968	1969	1996b			1986		
	8	1951	1969	1992		8	1976		
	9	1951					1989		
		1965	1969				1991		
			1978	1996e		9	Police st.		
	10	1951				10	1976		
		1979					1992f		
		1990e				11	1976		
	11	1951	1969				1979f		
			1977			12	1976		
				1992			1980		
	12a	1951					1981		
		1963	1969			13	1976		
			1977	1992			1983		
	12b	1963	1969				1991		
		1984				14	1976		
	13	1951					1988e		
		1959				15	1976		
		1968	1974				1985		
			1979				1986		
			1984	1993		16	1983		
	14	1951					1991		
		1959	1969			17	1987-8d		
			1993	1994					
	15	1951	1969	1988					
				1989					
	16	1951	1969						
			1992	1993					
	17	1951							
		1951	1970	1992					
	18	1951	1969						
			1980						
	19		1975						
			1980	1995d					

Keys: * Each row represents a different entitled colonist.

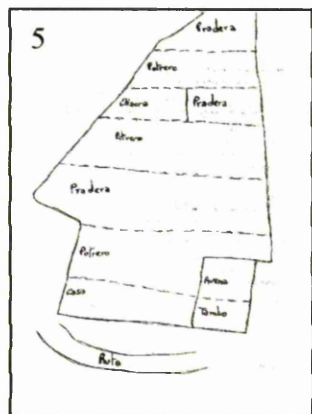
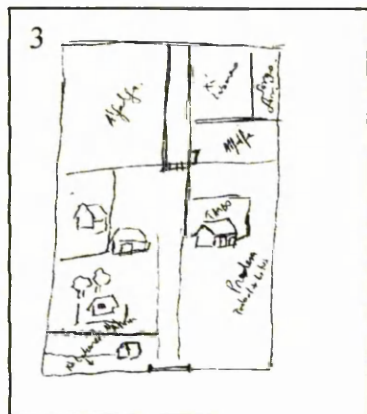
1995a The owner of a plot marked with a letter owns or rents another one from the NCI.

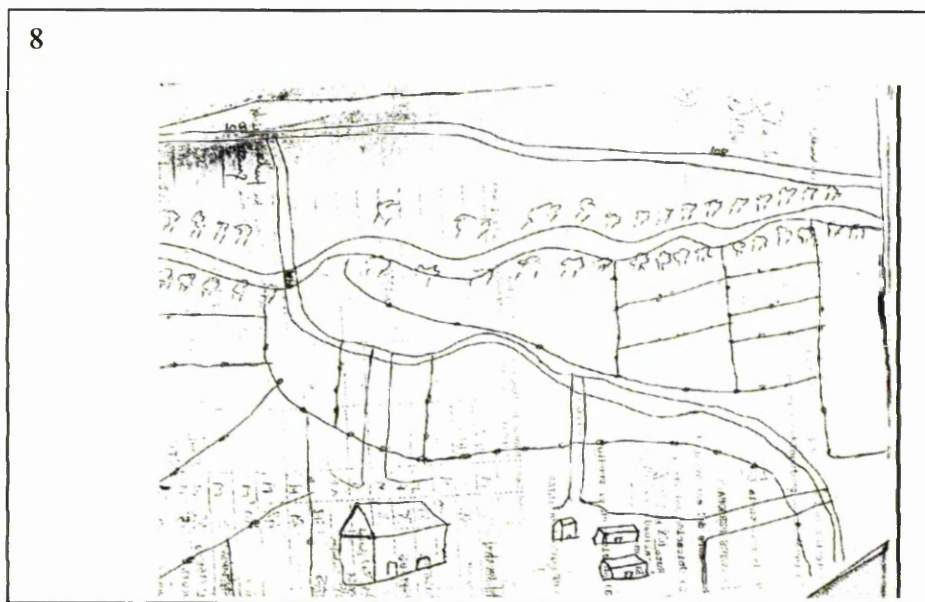
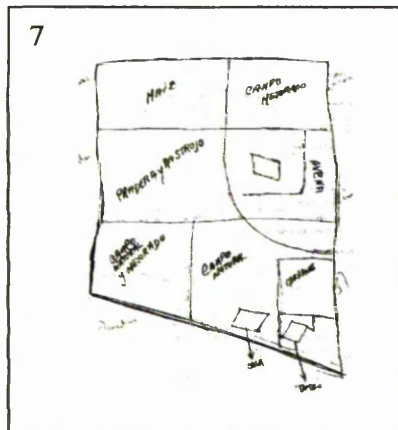
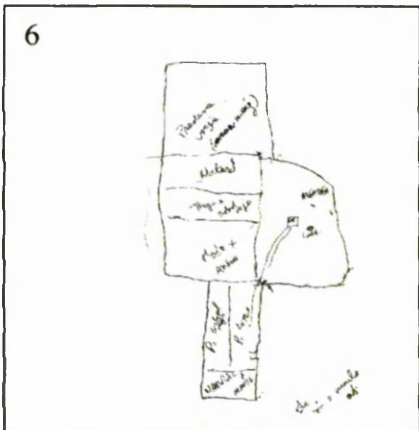
Source: Instituto Nacional de Colonización (1998).

Appendix C. Rural population in the 13th District of the Province of Lavalleya in 1996, according to age and sex



Source: Based on INE (1997a)





Appendix E. Time-allocation among a family of dairy farmers

Period: 18-24 April 1998.

Head of the farm (female, aged 40)

Time	Day						
	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
06:00							
07:00					Mate		Mate
08:00	Mate	Mate	Mate	Mate	Travel to	Mate	
09:00	Milking	Milking	Milking	Milking	Health centre	Milking	Milking
10:00	Small farm animals(1)	Small farm Animals	Small farm Animals	Small farm Animals	In Minas (26 km)	Small farm animals	Small farm animals
11:00	Breakfast	Mate	Breakfast	House keep.		Sell cattle	Cooking
12:00	Cooking	Cooking	Cooking	Cooking		Cooking	Lunch
13:00	Lunch	Lunch	Travel to	Lunch	Lunch	Lunch	Travel to cattle
14:00	Washing-up	Travel to	Health centre	Washing-up			
15:00	TV	Verdún	in Minas (26 Km)(3)	House	House	House	market (San Ramón, 120 km)(5)
16:00		(religious		Animals	Cleaning	Garden (4)	
17:00	Cooking	Peregrination, 20 km)(2)			Parlour		
18:00	House		House		Tank wash.		
19:00	Mate		Mate		Milking	Mate	
20:00	House+TV	Mate		House	Cooking	Milking	House+TV
21:00			Milking machine Washing	TV			
22:00		Milking	TV, long phone-calls		Travel to	TV	
23:00		Rest	Rest	Rest	Daughter's Birthday	Rest	Rest
24:00:00	Rest				Party(5km)		
01:00:00							

Observations:

1. Includes: feeding calves, pigs, hens and chickens.
2. 19th of April, *Día de la Virgen del Verdún*. It is the most important catholic peregrination in the country. It is also an open-market day for food, crafts and other commodities.
3. She accompanied his younger son to a medical appointment to arrange a future surgery.
4. To collect dry leaves from around the house.
5. San Ramón' cattle market is specialised on dairy-cattle, being the centre of a traditional milking belt. Three days before the event, the organiser of the cattle auction visited the dairy farms in Villa del Rosario to advertise his special loan schemes for *Conaprole* remittants.

Son (aged 21)

Time	Day						
	Saturday	Sunday	Monday	Tuesday	Wednes. (2)	Thursday	Friday
06:00							
07:00					Milking		Mate
08:00	Mate	Sleep	Sleep	Mate		Mate	Milking
09:00	Milking			Tractor repair	Tractor repair	Fields work	Visit
10:00	Bale feeding(1)					off-farm	neighbours
11:00	Breakfast					(Barrancas, 10 km)	for future job (Ortiz 5 km) (4),(5)
12:00	Tractor repair						Lunch
13:00	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
14:00	Siesta	Travel to Verdún	Siesta	Siesta		Tool-mainten.	Travel to
15:00	TV				Fields work	Fields work	cattle
16:00		(religious)	Tractor repair	Tractor repair	Off-farm	off-farm	Market (San
17:00	Bale feeding	Peregrination 20 km)			(Barrancas, 10 km)(3)	(Solis 5 km) (3)	Ramón, 120 km)
18:00	Visit neighbour		Stay in house				
19:00	Mate		Tank-washing			Mate	
20:00	Milking	Minas, Dancing Party	Milking	Milking		Milking	Milking
21:00	Dinner+TV		Dinner+TV			Dinner+TV	
22:00				Dinner+TV	Travel to Sister's Birthday Party (5 km)		Dinner+TV
23:00	Dancing		Rest				
24:00:00						Rest	
01:00:00				Rest			Rest

Observations:

1. Because of muddy ground, lactating cows were kept near the house and fed with fodder instead of drive them to the pastures.
2. Good weather conditions enable Roberto to till the land with his tractor.
3. This young farmer and a neighbour had just bought a new tractor and disc plough. The former was paying part of his debt by working the lands of his partner.
4. He went to arrange his payment for a future maize manual harvest. This is a common temporary job among youngsters in Autumn.
5. He visited other known dairy farmers to offer them to share the costs of transport to the afternoon's cattle market.

Son (aged 11)

Time	Saturday	Sunday	Monday	Days Tuesday	Wednesday	Thursday	Friday
06:00							
07:00					Breakfast		
08:00	Breakfast		Breakfast	Breakfast	Travel to	Breakfast	Breakfast
09:00	Visit kin	Breakfast	School(2)	School	Health centre	School	School
10:00	Play fields(1)	in Visit grand			In Minas (26 km)		
11:00		Parents					
12:00		Next house					
13:00	Lunch	Lunch			Lunch		
14:00		Travel to					
15:00		Verdún		House +	House +	House +	House +
16:00	TV	(religious)		Playing	Playing	Playing	Playing
17:00							
18:00	Cattle driven		Stay in house		Cattle driven	Cattle driven	
19:00	Mate					House+TV	
20:00	House+TV	Mate		Homeworks			
21:00		House+TV	TV	TV		Rest	
22:00			Rest	Rest	Travel to		Rest
23:00	Rest	Rest			Sister's		
24:00:00					Birthday party		

Observations:

1. He used to play with his cousin who lives next to him, by riding their horses across the fields.
2. He travelled to school, which was 5 km away, by coach.

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