THE DAIRY INDUSTRY

of the

PATERSON VALLEY

1945 - 1980

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SYNOPSIS

This thesis examines the dairy industry of the Paterson Valley of New South Wales between 1945 and 1980. It describes the constraints that the physical environment places on the spatial distribution and other characteristics of the industry and gives a historical background of the study area in an attempt to show the context in which dairying has developed. The industry in the Paterson Valley is compared with that of New South Wales, showing that there was a general expansion in dairying between 1945 and 1955, followed by a general period of decline between 1955 and 1980. The reasons behind these trends in the industry are given, as are the major alternative forms of land-use which have replaced dairying in the study area.

"I hereby certify that the work embodied in this thesis is the result of original research and has not been submitted for a higher degree to any other University or Institution".

<u>*Ivan Clarke Skaines*</u>

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INTRODUCTION

More than any other Australian rural industry, the dairy industry has traditionally been characterised by more problems and complications. In the last 50 years its relative importance in the Australian economy as a whole has slowly decreased in terms of the number of people it employs and the revenue it earns from sales on both the domestic and overseas markets.

Much has been written about the Australian dairy industry in general, and specific studies have been carried out on certain aspects of the industry and on the industry in certain areas. This includes work by Bell and Nalson (1974) on the North Coast, Codrington (1979) on the South Coast and March (1965) on the Hunter Valley. These studies examine the dairy industry at great depth on a smaller scale in an attempt to qualify those factors which affect the industry as a whole.

This study will attempt to examine the dairy industry of the Paterson Valley of New South Wales between 1945 and 1980, a period in which the industry suffered a serious and sustained decline. The Paterson Valley was chosen because it is a self-contained area with definite boundaries. It is totally contained within the Shire of Dungog, and since 1952 has been supplying milk and cream to the Hunter Valley Co-operative Dairy Company.

This study will examine the dairy industry in terms of the constraints set by the physical environment and the context of the history of the Valley. The trends in the dairy industry between 1945 and 1980 will be examined and related to similar trends occurring in the dairy industry of New South Wales. The reasons behind the initial expansion in the industry and, after 1955, the subsequent sustained decline will be explained. Finally, the alternative forms of land-use which have replaced dairying in the study area will be examined to show that the Paterson Valley in 1980 is not unoccupied and unused.

CHAPTER 1

BACKGROUND OF THE DAIRY INDUSTRY

of the

PATERSON VALLEY.

LOCATION AND PHYSICAL BACKGROUND

The Paterson and Allyn Rivers have their source on the southern escarpment of the Barrington Tops, a spur of the Mount Royal Range located in the extreme north of the Hunter Valley. They flow in a general southerly direction, having their confluence near the small settlement at Vacy, and joining the Hunter River at Hinton. The Paterson Valley is approximately 76 kilometres in length, is usually less than 20 kilometres in width, and has a total catchment area of 1200 square kilometres (Refer to location map in Figure 1.1).

The Paterson Valley consists of three main physiographic regions. The northern section of the Valley contains narrow and steep walled ravines, dissected plateaux and rugged uplands, which give way to the more moderate slopes and rounded hills of the Eccleston and Lostock districts. The hilltops and slopes of the Mount Royal Range have leached, acid krasnozems derived from basalt caps, and thin and stony soils on the steeper slopes, with podsolic soils at lower elevations. The main vegetation type in this "headwater" region is rainforest and wet sclerophyll forest. Rainfall is usually in excess of 1000mm per annum (as exemplified in the rainfall statistics for Lostock and Shellbrook in Figure 1.2), but the higher country of the Barrington Tops annually receives up to 1500mm of precipitation, some of which falls as snow. Lumbering, beef cattle grazing and forest reserves are the major types of land use in this region (Refer to Plate 1.1). **(1)**

The middle section of the study area is characterised by steep inter-fluves, undulating slopes and discontinuous floodplains, which increase in size to the south (Refer to Plate 1.2). A cover of tall, mixed woodland remains on the steeper, more inaccessible slopes, but the dominant vegetation cover is either natural or exotic grasses, including paspalum, kangaroo grass or clover. This middle section has the lowest and most unpredictable rainfall, particularly during late winter and mid-summer. In mid-summer, high temperatures combined with low and variable rainfall frequently result in water stress

FIGURE 1.1 Location of the Paterson Valley

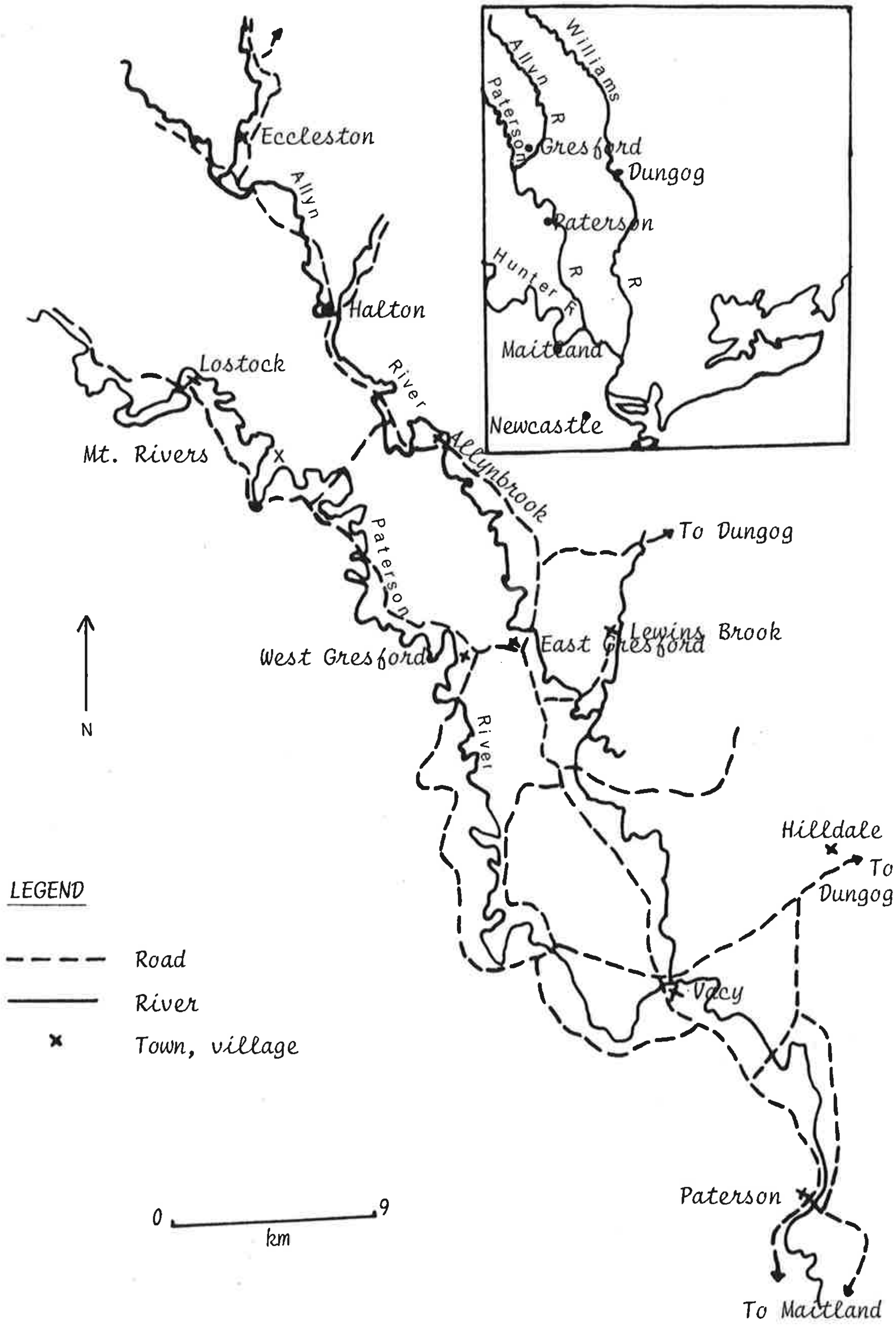
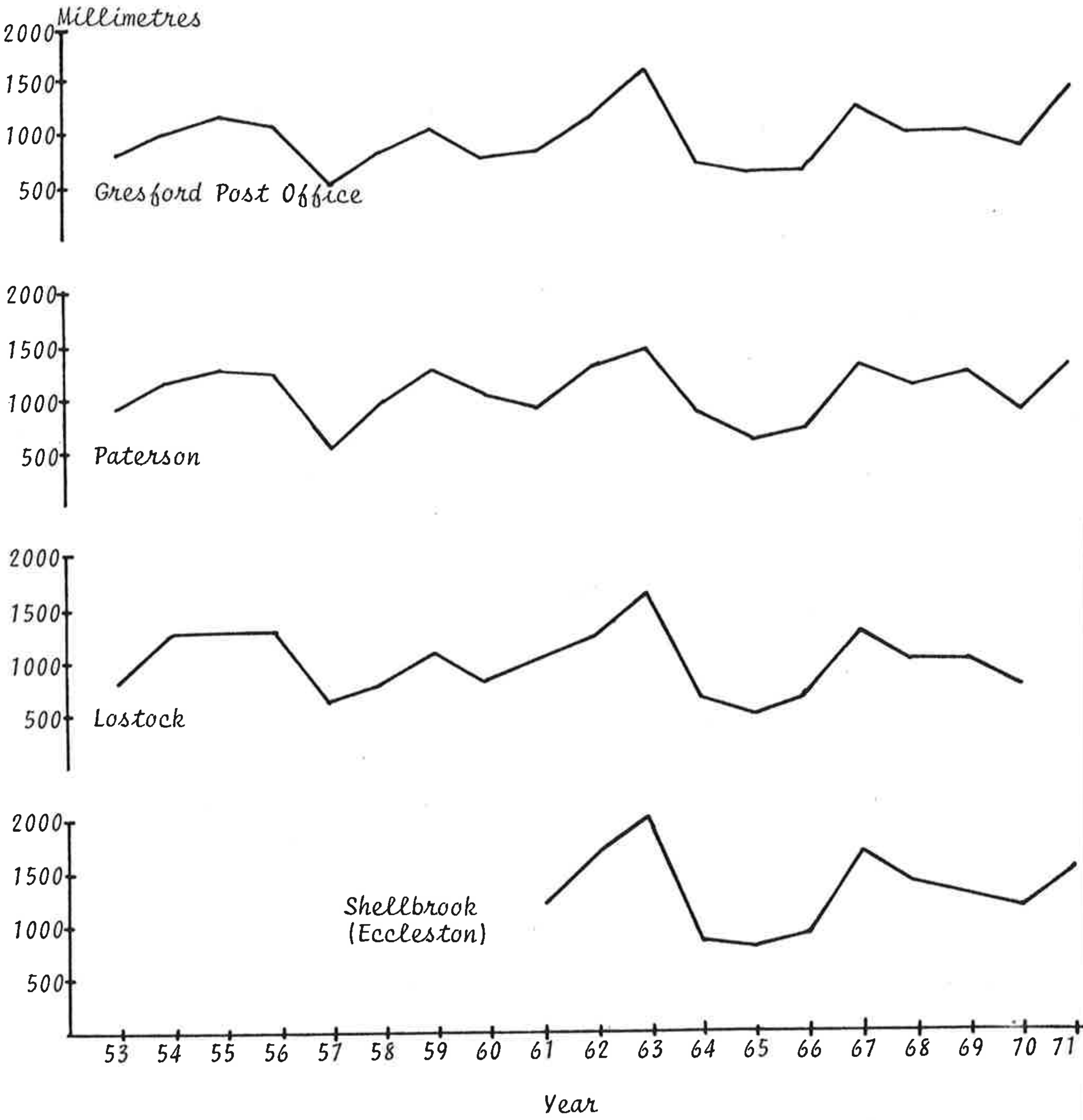
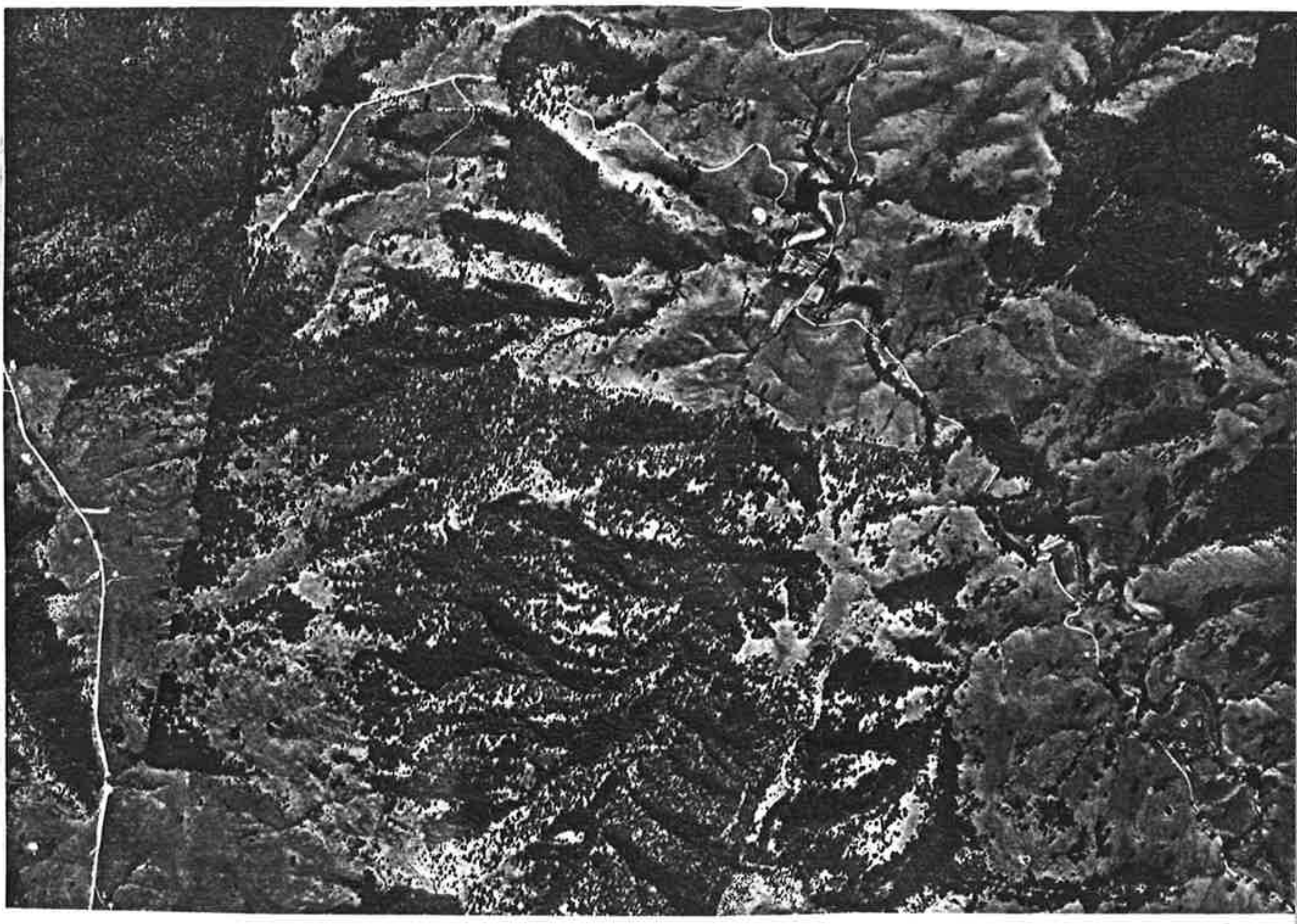


FIGURE 1.2 Rainfall - Paterson Valley



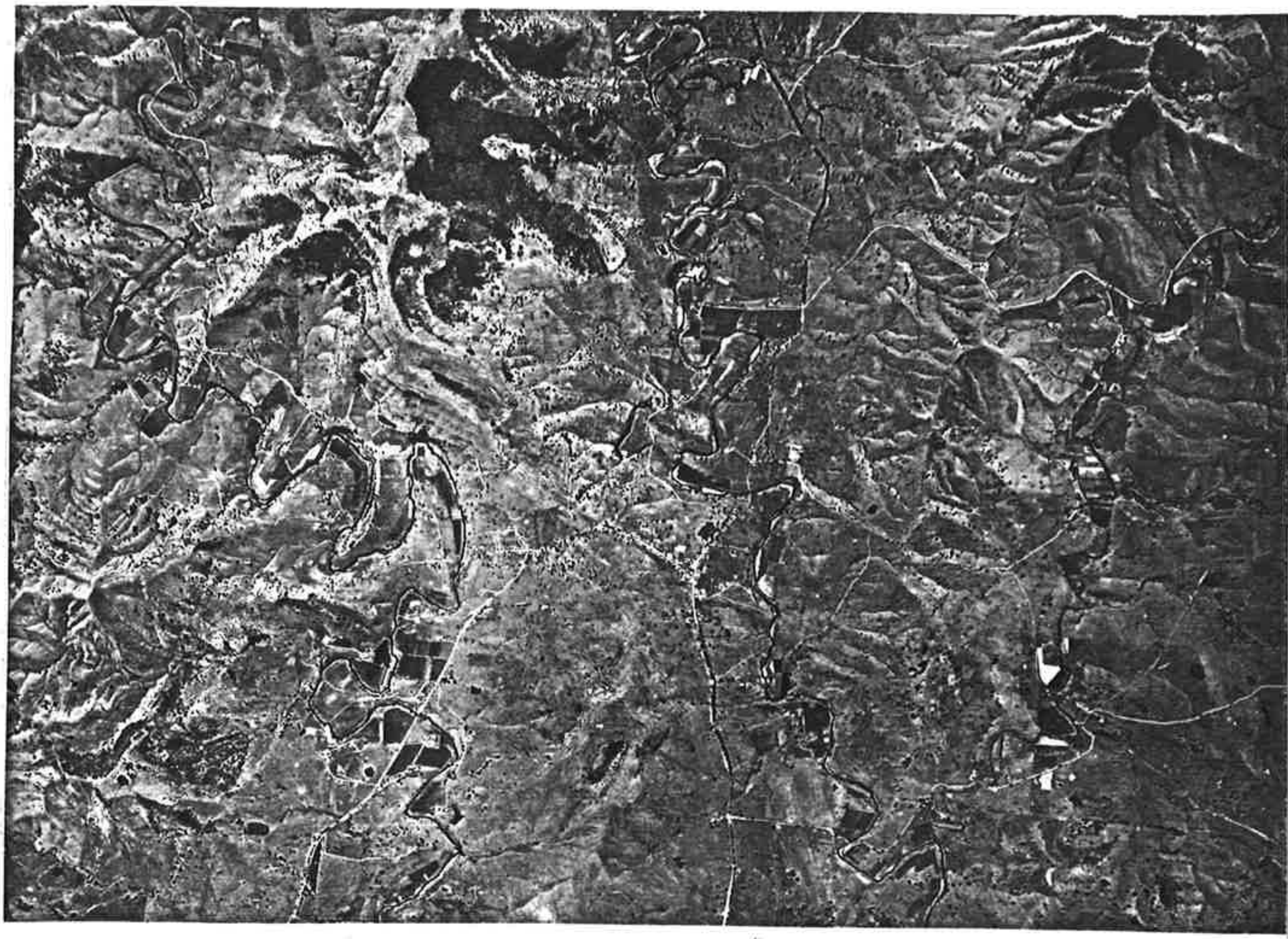
Source: New South Wales Bureau of Meteorology, 1980

PLATE 1.1



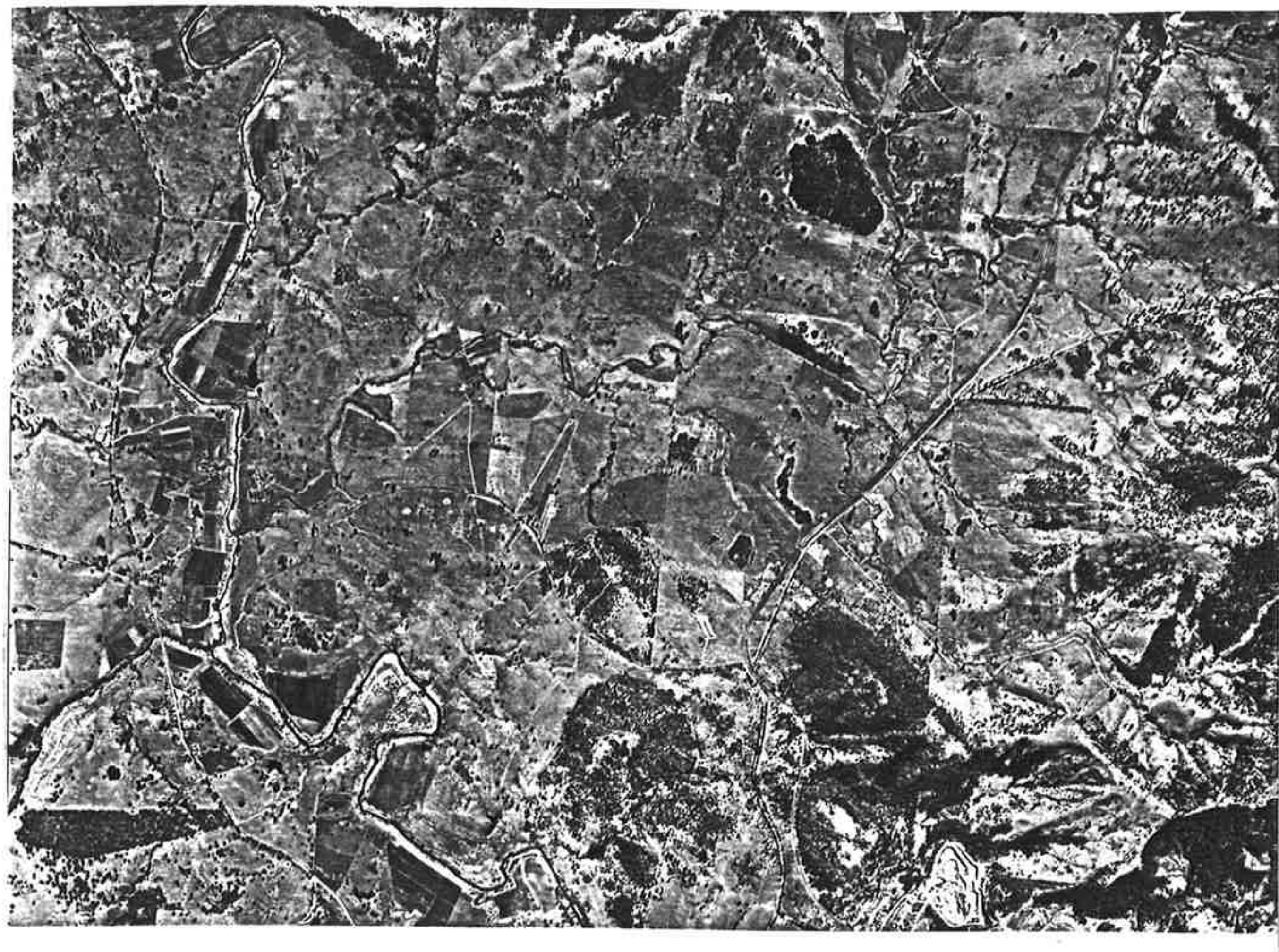
LANDFORM - REGION 1 (New South Wales Lands Department)

PLATE 1.2



LANDFORM - REGION 2 (New South Wales Lands Department)

PLATE 1.3



LANDFORM - REGION 3 (New South Wales Lands Department)

for plant life (Refer to Figure 1.3). Gresford, for example, has an average rainfall recording of 889mm per annum. (Refer to Figure 1.2). The undulating and steeper slopes of this region support beef cattle, whilst dairy farming is carried out on the fertile alluvial floodplains and the more gentle slopes, which are used as "dry" runs.

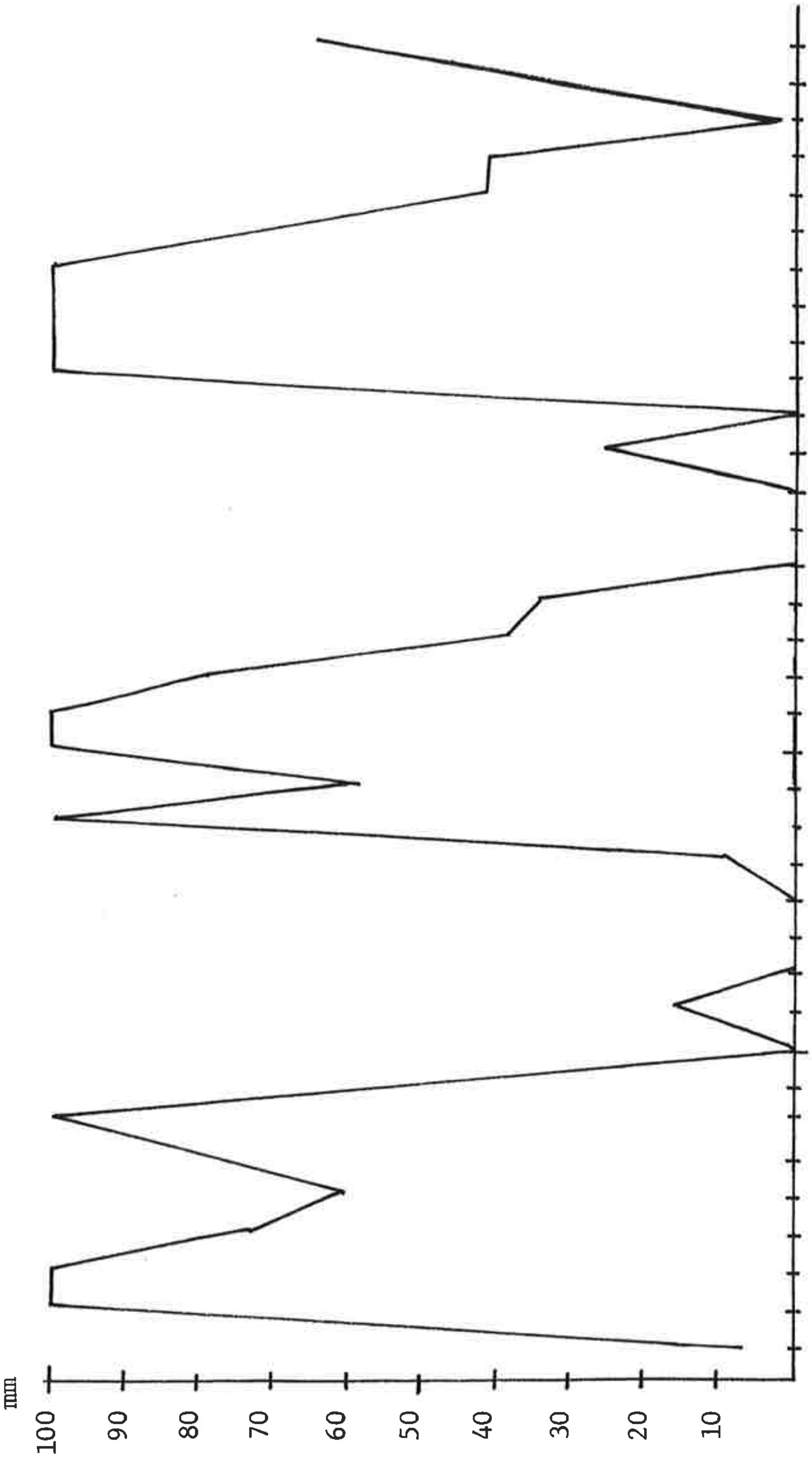
The lowest section of the Paterson Valley, and particularly that area between Paterson and Hinton, has a wide, continuous floodplain, backed by gently sloping hills. The alluvial terraces and swamps of the floodplain are subject to periodic inundation. (Refer to Plate 1.3). Most of the land in this section has been cleared for agriculture, and introduced grass species predominate. Under the influence of moist, maritime air masses, rainfall increases to 1000mm per annum and rainfall variability is reduced. (Refer to Figure 1.2). This section is least susceptible to frosts, which are only likely to occur for two months every year, and this allows the establishment of market gardens, as well as the operation of beef cattle grazing, dairy farms and horse studs.

HISTORICAL BACKGROUND OF THE PATERSON VALLEY

Permanent white settlement began in the Paterson Valley between 1821 and 1824 with the granting of land along the river between Vacy and Morpeth. Prior to this cedar getters had set up temporary camps along the riverbank. Before roads were built, the Paterson Valley was used as a transport route, with steamships and smaller boats plying the river as far as the township of Paterson. In the early years of settlement sheep and cattle grazing were the most important rural activities, arable farming being practised on only 4% of the total cleared area.

The period between 1840 and 1880 saw an increase in the profitability of mixed farming on smaller holdings, particularly after the collapse of the sheep-meat market in the late 1830's and the "unlocking of the land" with the Robertson Land Act of 1861. Wheat was grown and processed in the Paterson Valley until floods and a series of

1.3 Water Balance - Gresford



Source : Hunter District Water Board, Personal Communication, 1980.

droughts during the 1860's caused serious problems for the industry. The threat of stem rust in coastal wheat and the concurrent expansion of the colonial railway network into areas more suited to wheat cultivation west of the Great Dividing Range, caused a decline in the Paterson Valley wheat industry. The farmers of the Valley found a profitable alternative in the cultivation of maize, which was environmentally suited to wetter, coastal districts. It was fed to pigs which were slaughtered on the farm, where the meat was cured and smoked, then sold on the Newcastle and Sydney markets. (2)

Tobacco cultivation also proved to be a profitable activity, particularly where settlers only had a small area of cleared land. The American Civil War resulted in an expansion of local production due to the blockade of southern ports, although in the 1870's unstable prices, variable seasonal conditions and a centralisation of tobacco manufacture in Sydney, caused a decline in the industry in the Paterson Valley. Grapes and citrus fruits were also grown, for both home consumption and the local market. These industries are extremely important in that farmers in the study area were accustomed to producing for the commercial market and were continually searching for the most profitable rural activity.

BACKGROUND TO THE DAIRY INDUSTRY IN THE PATERSON VALLEY

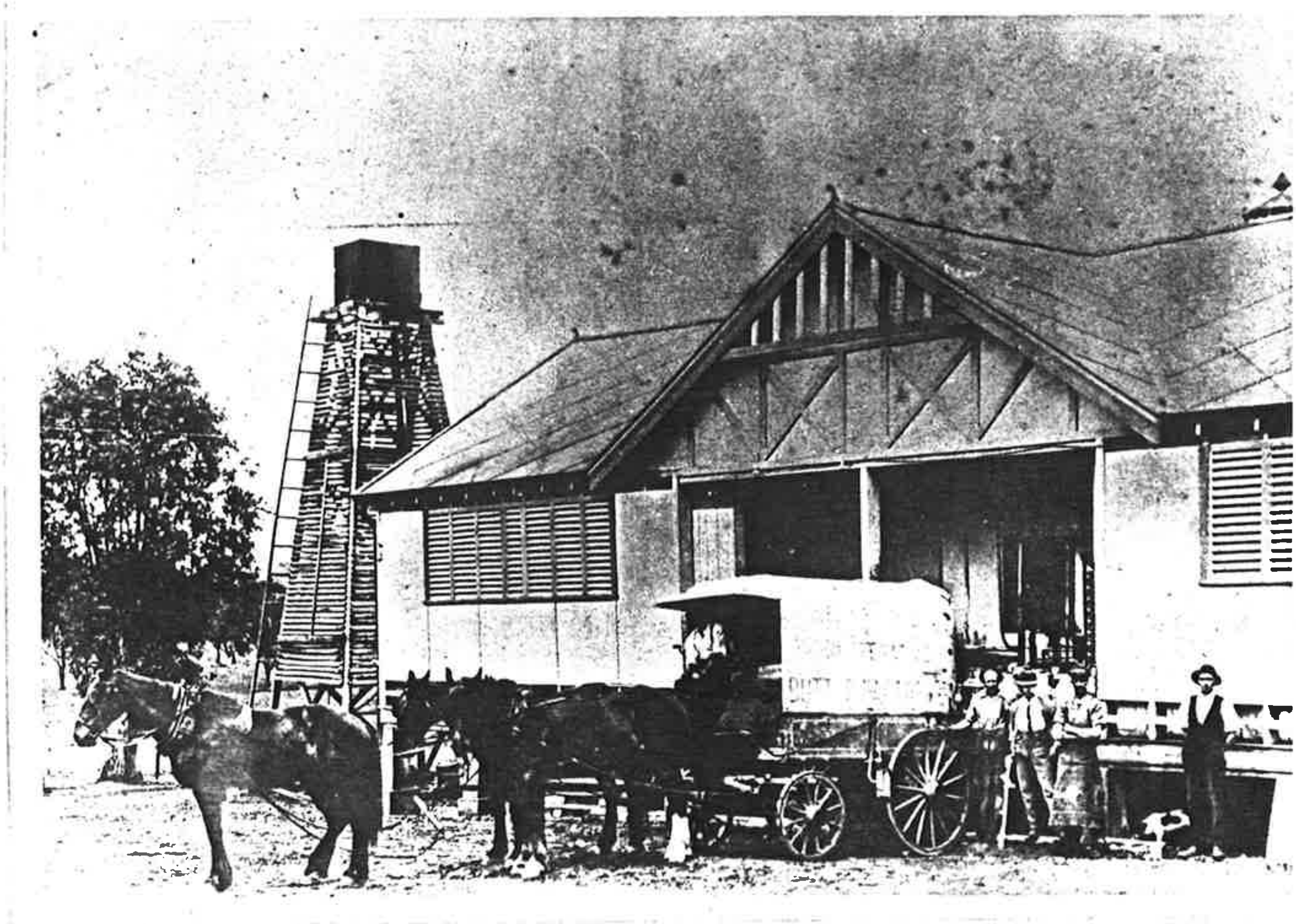
Developments which have influenced the dairy industry of the Paterson Valley have also influenced the dairy industry as a whole, and have resulted in an increasing market orientation and a changing spatial distribution. Prior to the 1880's the production of liquid milk was very much orientated towards the local market because of the perishable nature of the product, the primitive nature of the transport technology, and the poorly developed rural road network. Commercial dairies supplying Newcastle with liquid milk were located in close proximity to the urban area. By contrast, farms in the Lower Paterson Valley were typically involved in the manufacture of butter, since it could be stored for longer periods of time and the cost of transporting butter was much less than its equivalent in whole milk. In these circumstances dairying was a profitable pioneer industry for cows could be grazed in the clear areas, which were also the most productive, and the sale of milk or butter provided the farmer with a regular income.

In the 1880's the Australian dairy industry adopted a number of innovations which caused radical geographic change. The introduction of the mechanised cream separator meant that the industry became more efficient in terms of the amount of cream required to make a given quantity of butter. This machine was beyond the means of the individual farmer and resulted in the establishment of numerous proprietary creameries. Such creameries were located at Vacy, Gresford and Allynbrook. After milking their cows, farmers brought the milk to the creamery, waited for it to be separated, and returned to their farms with the skim milk, which was fed to pigs and small calves. (Refer to Plate 1.4)

Another advance in dairying came with the introduction of the inexpensive, hand-operated separator, which was readily available to the individual farmer. Separation took place on the farm immediately following milking, thereby saving the time and effort previously involved in travelling to the central creamery. Cream, being less perishable than milk, was taken thrice weekly to the butter factories at Gresford or Gostwyck (Refer to Plate 1.5), and thus dairying expanded further towards the headwaters of the Paterson and Allyn Rivers. Improved rural roads, the advent of mechanised road transport, and the expansion of the North Coast railway through Hilldale, Martins Creek and Paterson in 1910 and 1911 meant that travelling times and costs were reduced throughout the Paterson Valley. (Refer to Plate 1.6)

The two major problems confronting the Australian and New South Wales dairy industries during the fifty years after 1880 were related to the maintenance of both milk quality and an adequate supply of milk during the winter months. The State Government attempted to solve these problems through Acts of Parliament, including the Dairy Industry Act of 1915 which was designed to "regulate the manufacture, sale, storage, transit and export of dairy produce; to provide for the testing and grading of cream, and for the grading and branding

PLATE 1.4



HORSE & CART, BOWTHORNE BUTTER FACTORY LTD.

(Reproduced with kind permission from the Hunter Valley Co-operative Dairy Company, Hexham)

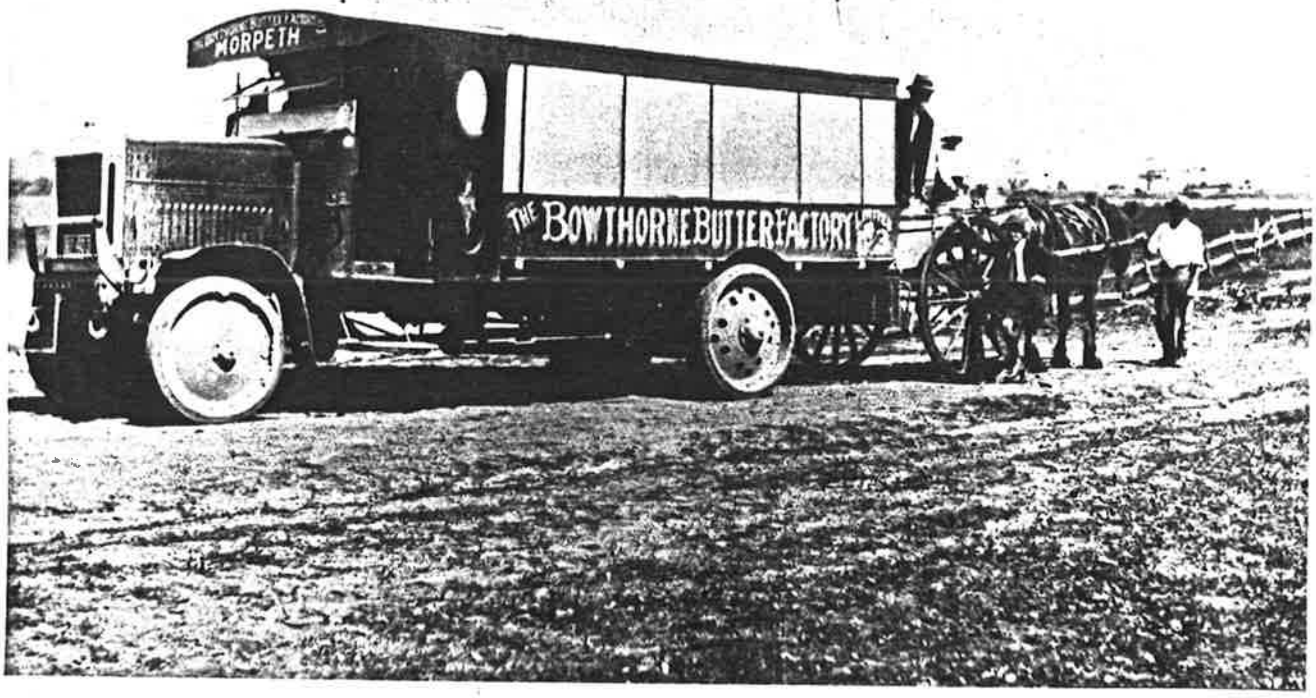
PLATE 1.5

GOSTWYCK BUTTER FACTORY - 1921.

BUTTER FACTORY, GOSTWYCK

(Reproduced with kind permission from the Hunter Valley Co-operative Dairy Company, Hexham)

PLATE 1.6



TRUCK, BOWTHORNE BUTTER FACTORY LTD.

(Reproduced with kind permission from the Hunter Valley Co-operative Dairy Company, Hexham)

of butter". (3)

However, it was the wide fluctuations in milk quantity supplied to the metropolitan market between the spring and summer maximum, and the autumn and winter minimums, that caused industry authorities the most concern. Fluctuations in supply caused marked fluctuations in the price of milk, and frequent periods of milk shortage and rationing in the urban market. The pattern of seasonal glut and shortage was caused by the majority of farmers following a set farm routine. Cows usually calved and were brought into milk during the period of spring pasture growth, but were dried off in autumn before the period of winter fodder scarcity.

The solution to these two problems was believed to be in the formation of the New South Wales Milk Zone in 1932. Farmers within defined boundaries were granted higher prices for their liquid milk, thereby encouraging these producers to maintain milk supply during the period of winter fodder shortage. The lucrative prices were incentives for improved production methods, including fodder conservation, herd improvement, irrigation and pasture management. The New South Wales Milk Board also exercised a close supervision of all aspects of milk production, processing and distribution.

This Act had marked effects on the dairy industry in the Paterson Valley. Dairying became artificially profitable after 1942 when the study area entered the Milk Zone because the price of milk obtained no longer depended on a free market situation, but upon a highly regulated, protected market. This artificial profitability induced dairy farmers as far north as Eccleston and Lostock to participate in liquid milk production. Only those farmers living in particularly inaccessible areas remained cream producers, due to the difficulty of transporting milk to the factory every day.

The period between 1880 and 1945 was one of expansion in the dairy industry as a whole. Technological improvements, including the introduction of the hand-operated separator, and increased government involvement in the dairy industry, caused a real expansion in dairy farming, as well as an increasing orientation towards the market.

REFERENCES

(1) Commonwealth Scientific and Industrial Research Organisation, (1963), page 8

(2) Coral Lee, personal communication, 1980

(3) Wadham, Samuel, Wilson R. Kent and Wood, Joyce, (1964), page 150

CHAPTER 2

TRENDS IN THE DAIRY INDUSTRY

of the

PATERSON VALLEY BETWEEN 1945 AND 1980.

In the previous chapter dairying in the Paterson Valley was discussed in relation to the prevailing physical environment and the constraints it places upon the spatial distribution of the industry. A history of the study area showed that dairying is a more recent example of the way in which primary producers, given a limited supply of land, attempt to maximise their profits. The expansion of the industry was shown to be related to the formation of the New South Wales Milk Zone and the introduction of more cost-efficient technologies. In this chapter the trends in the dairy industry of the Paterson Valley will be described for the 35 years between 1945 and 1980, and these will be compared with trends in the New South Wales dairy industry.

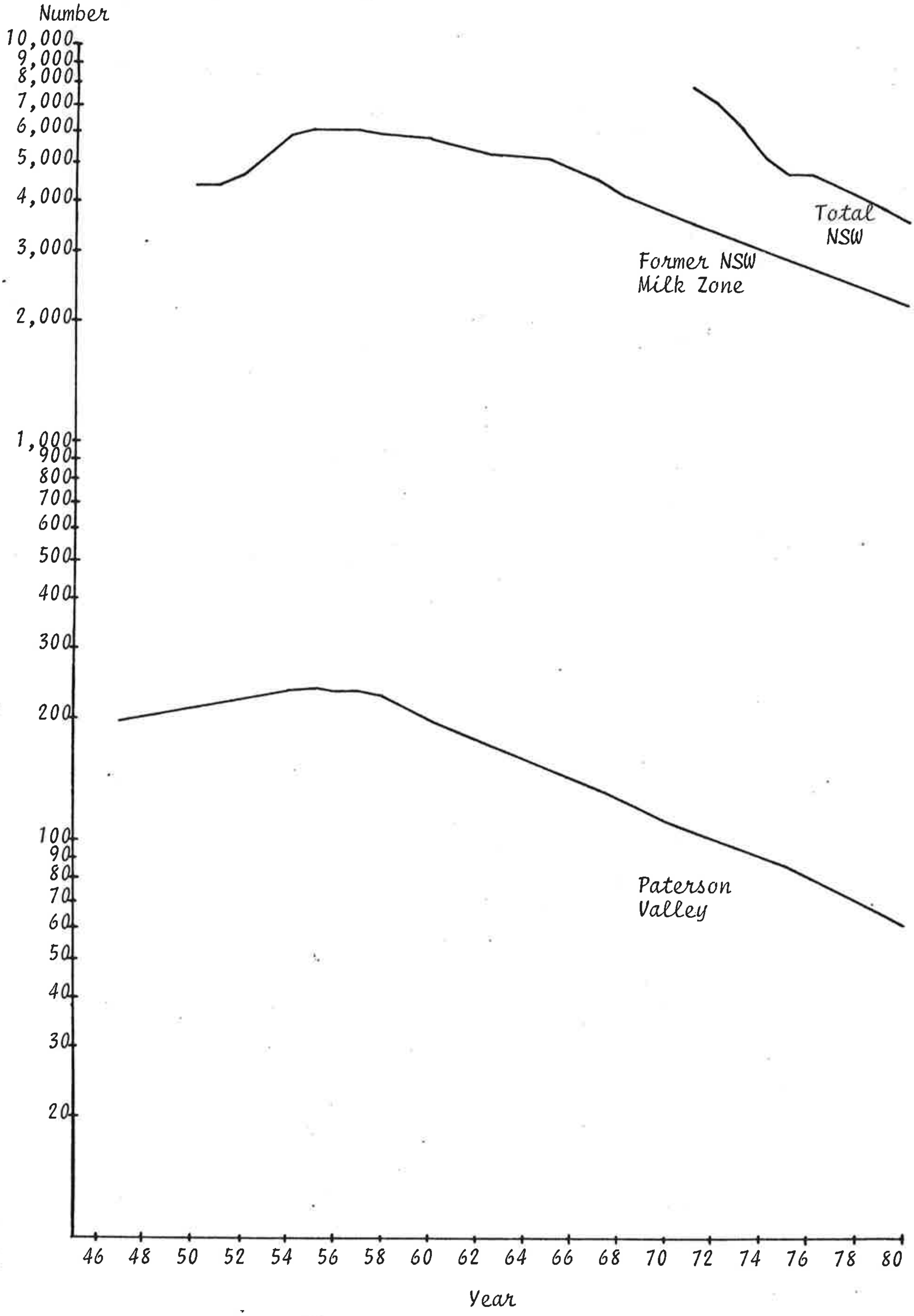
DAIRY FARMER NUMBERS

The first development which has taken place in the local industry since 1945 is the changing number of farmers operating dairy enterprises. (Refer to Figure 2.1). Between 1945 and 1955 the industry experienced a period of expansion with dairy farmer numbers increasing from approximately 200 in 1947 to a maximum of 248 in 1955. Since 1955 there has been a marked downturn in the number of dairy farmers to 110 in 1970 and then to only 62 in 1980. The average rate of withdrawal of dairy farmers within the study area between 1955 and 1980 has been 5.2% per annum.

There has also been similar trends operating in the New South Wales dairy industry. (Refer to Figure 2.1). In the 10 years between 1945 and 1955 numbers of registered suppliers increased from 3305 to 6087 or 6.3% per annum. Since 1955 farmer numbers within the former Milk Zone have decreased to 5809 in 1960, 3700 in 1970 and 2200 in 1980. Dairies registered with the Dairy Industry Authority have declined since the Authority's inception in 1971. In 1980 there were only 3600 suppliers registered with the Authority. (Refer to Figure 2.1).

The dairy industry is also declining at the national level with farmer numbers falling from a maximum of 120,000 in the mid 1950 s

FIGURE 2.1 Number of Registered Milk Suppliers



Source: Mr. Cyril Catt, personal communication, 1980; Dairy Industry Marketing Authority, 1980 to 21,000 in 1980. In mid 1980 the rate of exodus from the Australian dairy industry stands at 4 a day. **(1)**

The decline in the number of dairy farmers has not occurred uniformly throughout the Paterson Valley. (Refer to Figures 2.2,2.3 & 2.4).
In 1960, when the industry was still near its peak, dairy farms were to be found from Paterson in the south to Carabolla and Upper Allyn in the north of the Valley. The majority of holdings were located in close proximity to the Paterson and Allyn Rivers, although many farms were located on smaller tributaries such as Masseys Creek, Chad's Creek and Lewins Brook. One of the most outstanding features of the industry was the remote location of many farms, being considerable distances from main roads or located across rivers and streams.

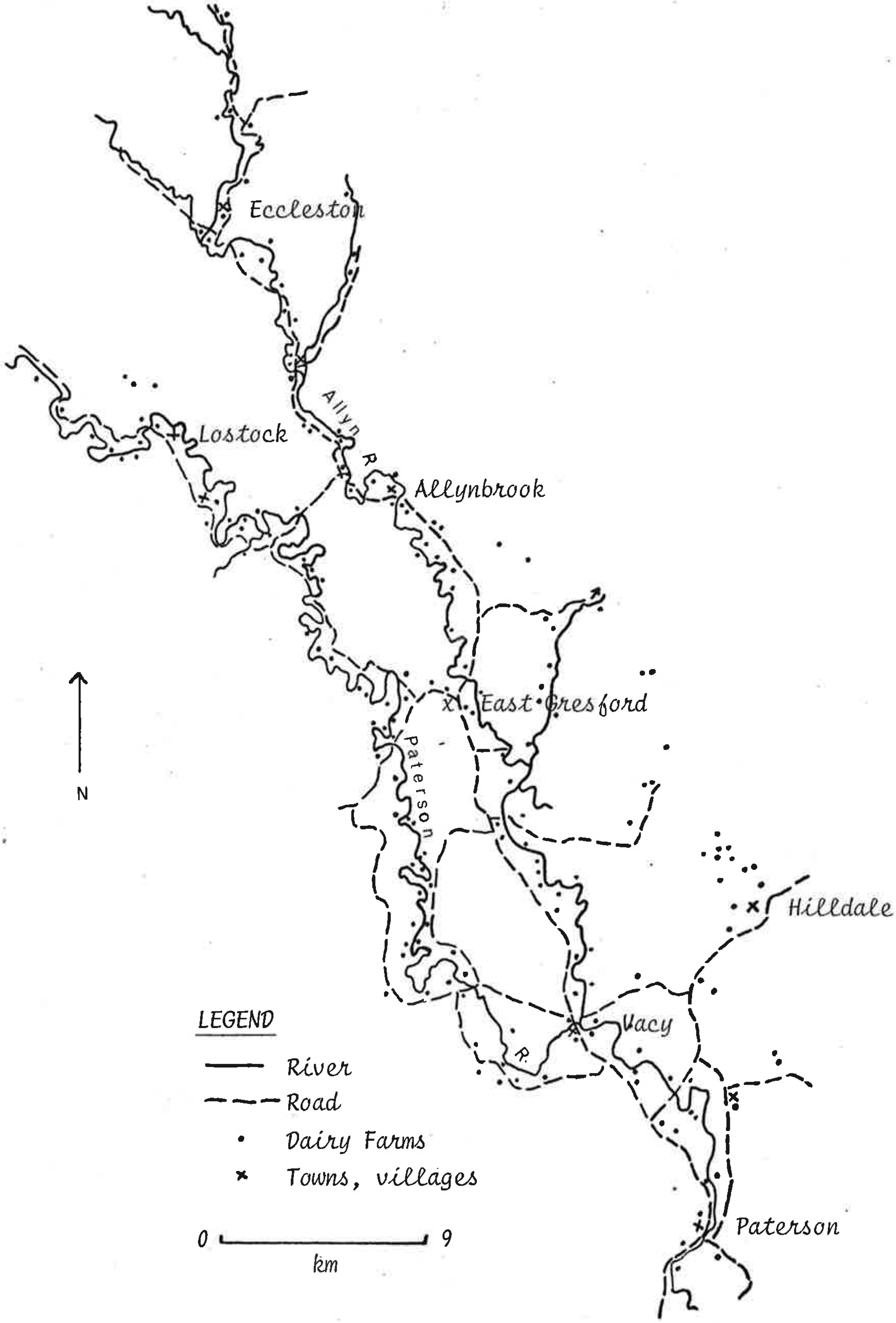
By 1980 the more remote farms had generally ceased dairying, as had those farms located away from rivers and creeks. However, dairying was still carried out on intermittent streams at Hilldale and Lewins Brook, sometimes using water stored in large farm dams. Other dairy farms located within short distances of main roads, and with ample water for animal use and irrigation, have been closed down. The construction of Lostock Dam on the upper reaches of the Paterson River for both water conservation and flood mitigation resulted in the displacement of seven dairy farmers.

DAIRY CATTLE NUMBERS

The decline in dairy farmer numbers since 1955 has also been reflected in declining numbers of dairy cattle in the study area. Statistics for the entire Dungog Shire, which comprises the strikingly similar Paterson and Williams Valley show that numbers of dairy cattle in milk and dry reached a maximum in 1963. Since then there has been a steady decline in cattle numbers so that, by 1979 there was less than half the number of dairy cattle compared with sixteen years previously. (Refer to Figure 2.5).

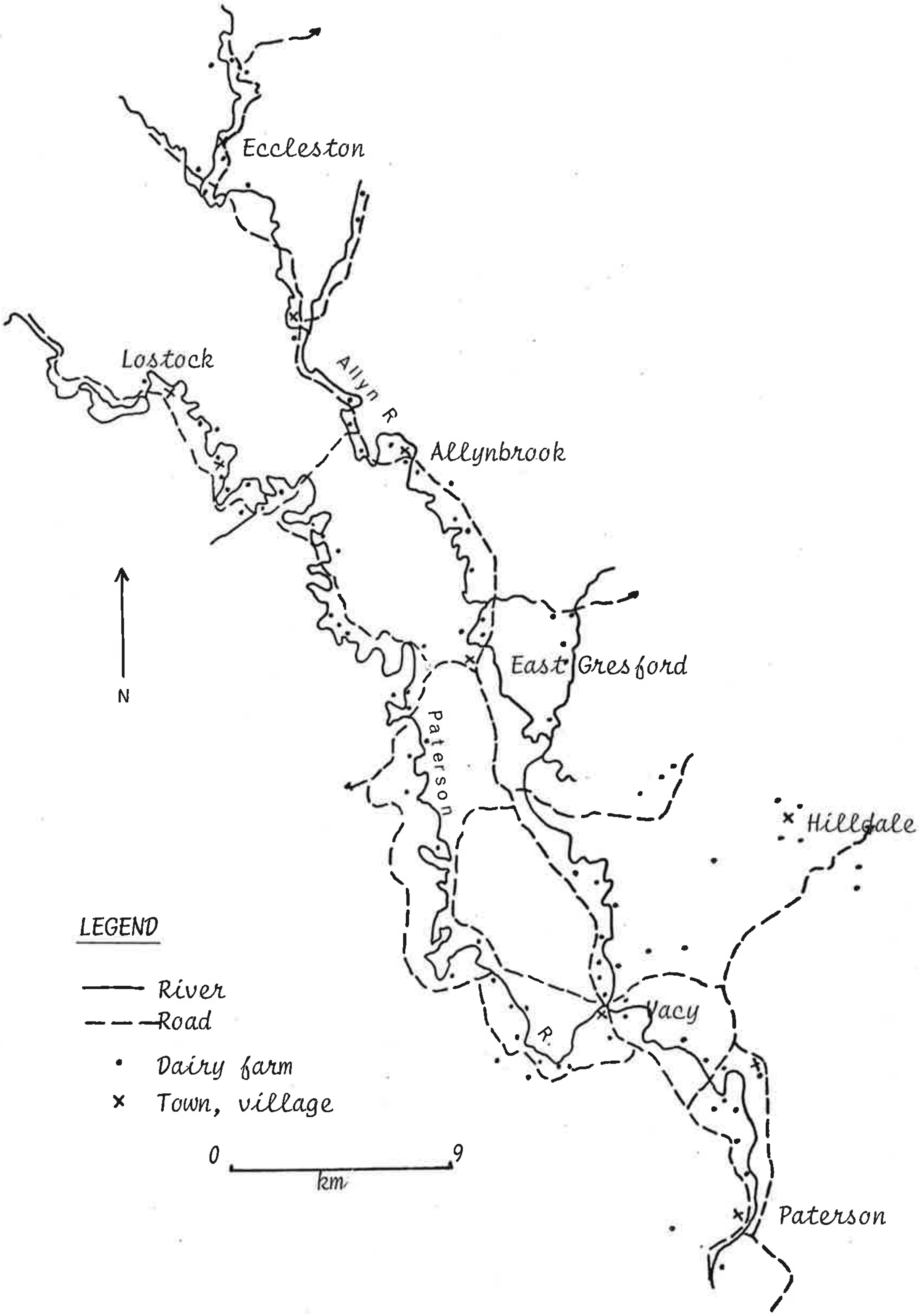
The trends in the number of dairy cattle in the Hunter Region have been very similar to those of the Dungog Shire. Cattle numbers

FIGURE 2.2 Distribution of Dairy Farmers in the Paterson Valley - 1960



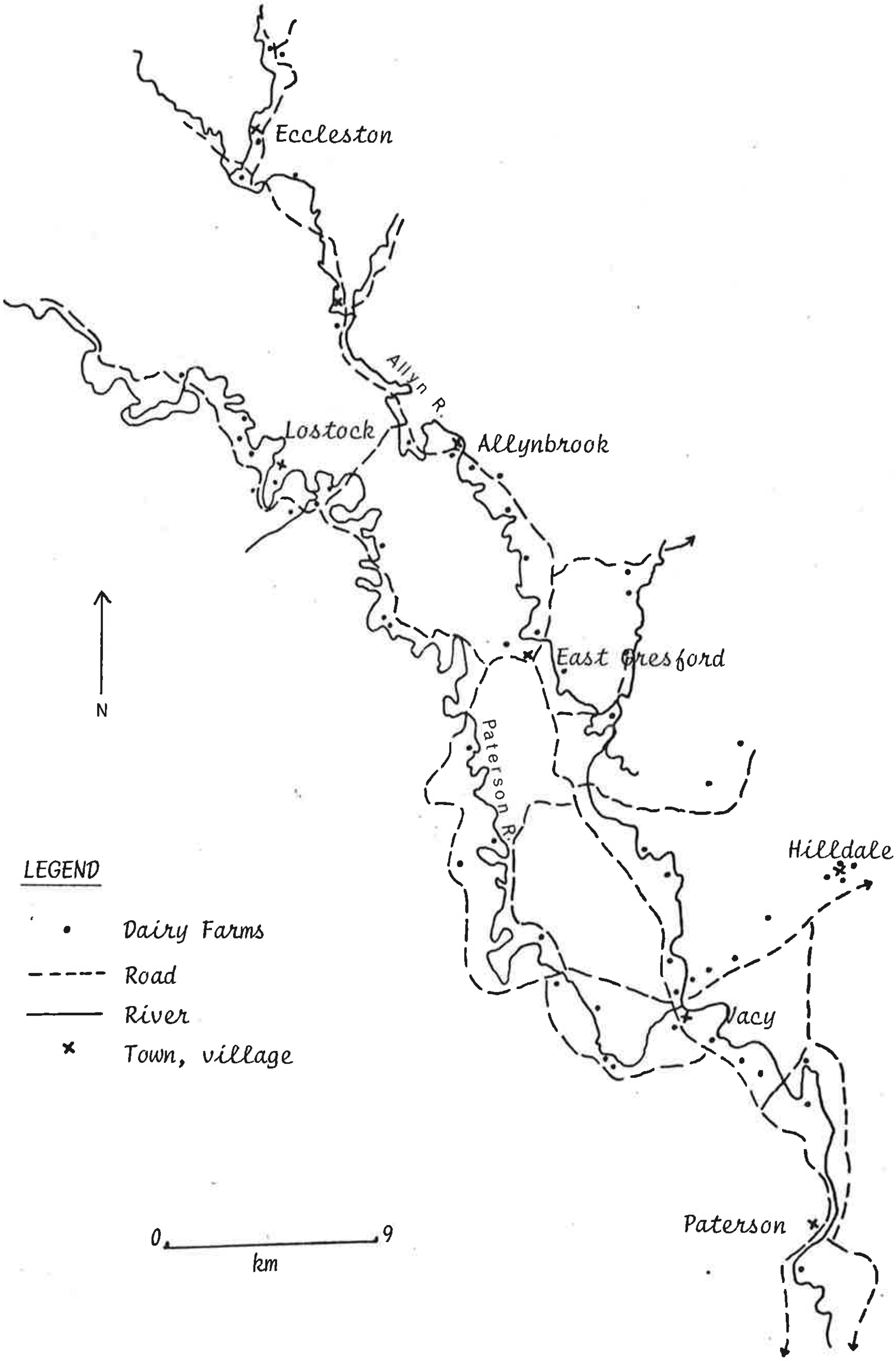
Source: Cyril Catt, personal communication, 1980

FIGURE 2.3 Distribution of Dairy Farms in the Paterson Valley - 1970



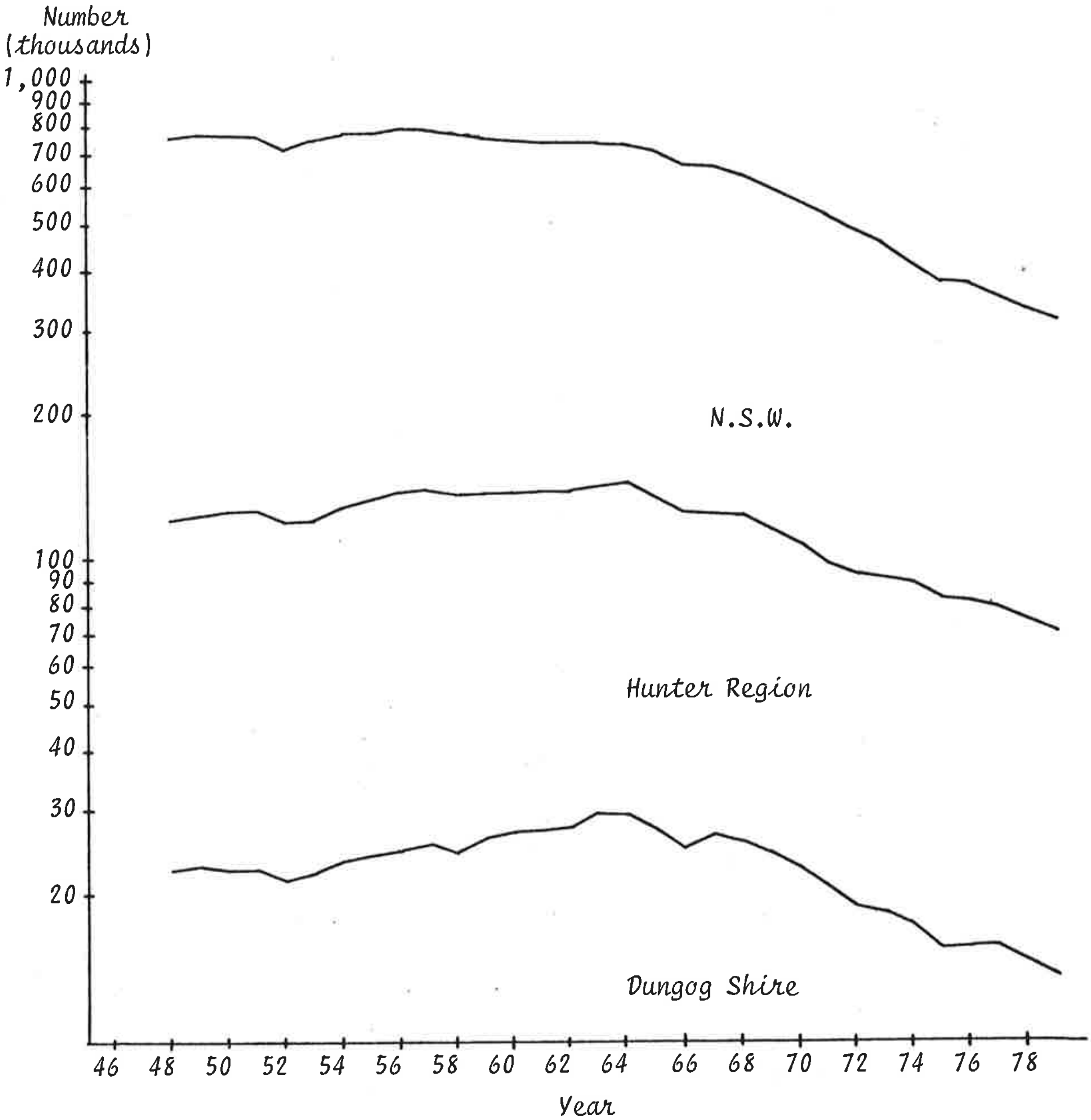
Source: Cyril Catt, personal communication, 1980

FIGURE 2.4 *Distribution of Dairy Farms in the Paterson Valley - 1980*



Source: Hunter Valley Co-operative Dairy Company, 1980

FIGURE 2.5 Cows in Milk and Dry on Commercial Dairies



Source: Australian Bureau of Statistics, *Agricultural Census*, 1947 to 1979 reached a peak in the Hunter in 1963 and have declined since that time. There occurred only one small resurgence in cattle numbers, this being immediately after the serious drought between 1964 and 1966 associated with restocking and herd rebuilding. The New South Wales dairy industry has experienced similar trends over the past 25 years, although the maximum number was recorded in 1956. It is also unlikely that the general downturn in dairy cattle numbers will be halted in the near future, especially since the 1979/80 drought caused dairy farmers to cull their herds.

MILK PRODUCTION

As a consequence of the decline in the number of dairy farms and in dairy cattle in the Paterson Valley there has also been a downturn in milk production. Peak milk output was achieved in 1963 and production was then hit by the 1964/66 drought after which there was a brief recovery in the 1967 season. Since the late 1960's total milk output for the Valley has declined, and with the impact of the 1980 drought is approximately 57.3% of total production in 1963.

The introduction of bulk milk collection after 1970, and the associated downturn in dairy farmer and dairy cattle numbers, had a marked effect on total milk production. Between 1970 and 1971 production fell from 25.9 million litres to 21.3 million litres, a decline of 17.5%. For the entire period between 1967 and 1980 the average decline in milk production was 4% per annum. It seems that total milk production for the study area will continue to fall below the 1979/80 level (16.7 million litres) as more farmers leave the industry.

The total annual milk production for New South Wales displays similar trends to that of the Paterson Valley, with production generally declining since a maximum of 1585 million litres was attained in 1960. Three major recovery periods have occurred in 1962, 1967 and 1970, and the rate of decline over the past 5 years has been relatively slower than for the periods 1965/70 and 1970/75. This may be partly due to the extension of metropolitan milk zone to the north and south coasts, which has stimulated the dairy industry in those areas. (Refer to Figure 2.6).

PRODUCTIVITY

Although there has occurred a downturn in dairy cattle and dairy farmer numbers and a reduction in total milk production for the Paterson Valley, between 1951 and 1971, the average annual milk production per dairy increased from 72,000 litres to 163,800 litres. Two factors contributed to this phenomena. The withdrawal of smaller producers caused an increase in average farm output and, secondly, individual farmers have increased their milk production. Despite this increase in efficiency, farmers in the Paterson Valley have failed to increase their milk production sufficiently to offset the production lost with farmers leaving the industry. (Refer to Figure 2.7).

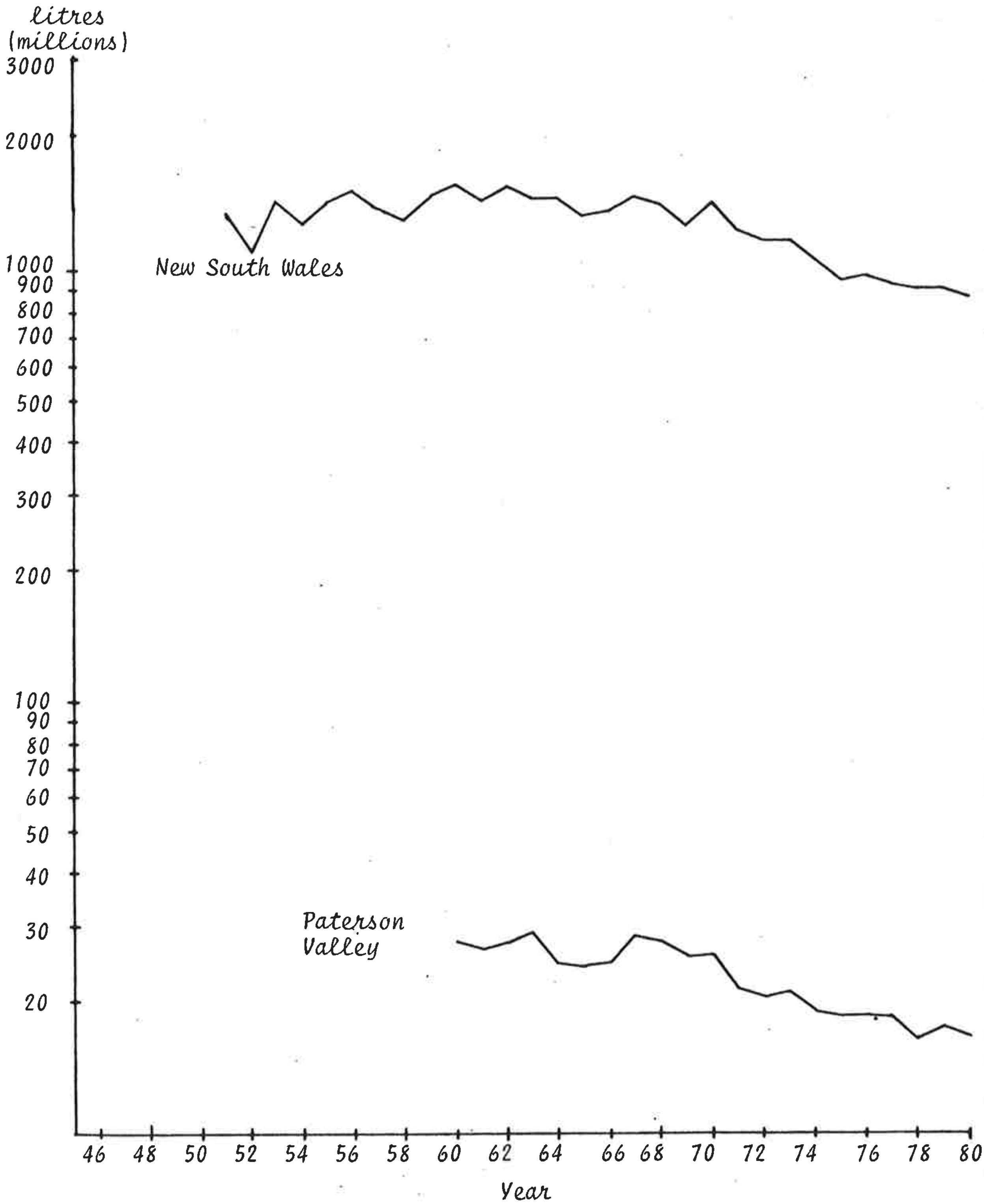
The average annual milk production per farm in the New South Wales Milk Zone increased from 72,345 litres in 1951 to 114,842 litres in 1960 and, finally, to 171,460 litres in 1968. Minor downturns in productivity mirrored those which occurred in the Paterson Valley in 1952, 1955 and 1958, but were generally of a smaller magnitude.

MONTHLY MILK PRODUCTION

Monthly milk production statistics for the Paterson Valley between 1947 and 1970 show the influence of both prevailing weather conditions and New South Wales Milk Board regulations. (Refer to Figure 2.8). Prior to 1955 the Board issued quotas to factories within the Milk Zone in an attempt to guarantee sufficient supplies of liquid milk to the metropolitan market, especially during the period of traditional winter shortage. However, the factory quota system failed to overcome the problem whereby farmers dried off their milking cows during late autumn and winter, because the onus to maintain supplies was not on the individual producer. (2)

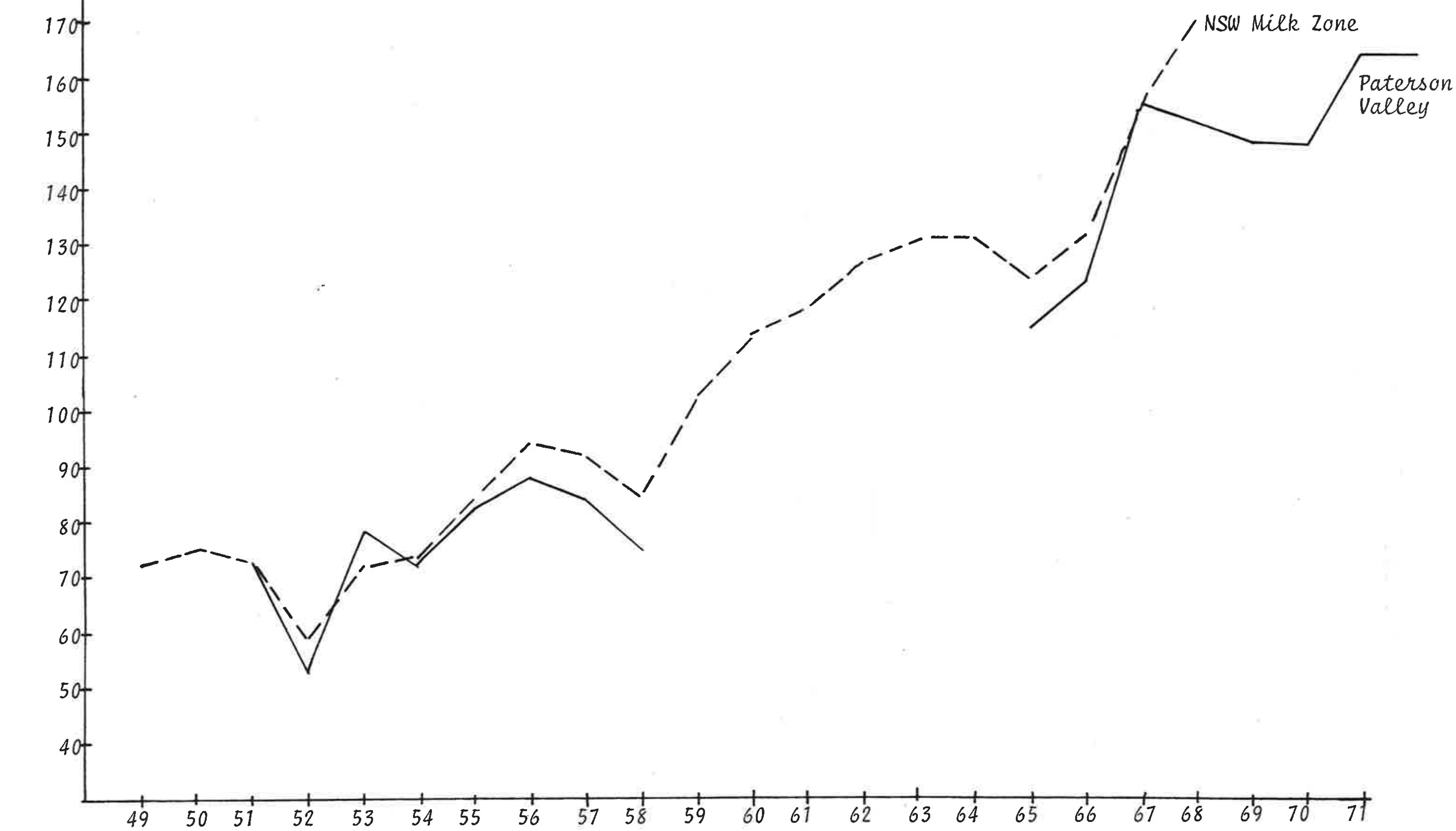
For this reason, monthly milk production for the study area was characterised by a regular, cyclical pattern. Most of the milk

FIGURE 2.6 Total Annual Milk Production



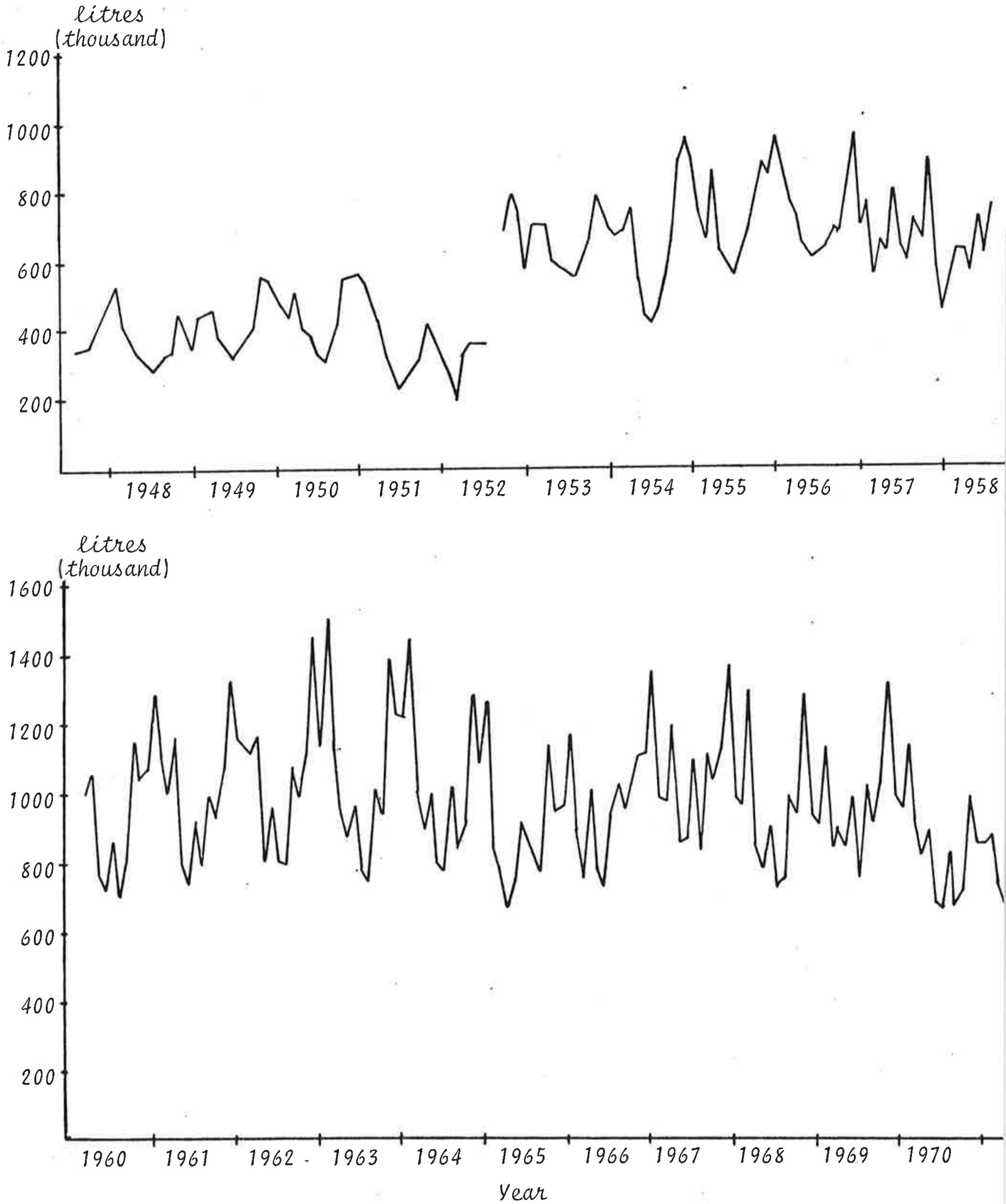
Source: Hunter Valley Co-operative Dairy Company, The Co-operator, various issues, and New South Wales Dairy Industry Marketing Authority, 1980

FIGURE 2.7 Estimated Average Annual Milk Production per Dairy Farm



Source: Hunter Valley Co-operative Dairy Company, The Co-operator, various issues, and New South Wales Milk Board, Liquid Milk Industry Digest, 1969.

FIGURE 2.8 Monthly Milk Production for the Paterson Valley.



Source: Hunter Valley Co-operative Dairy Company, The Co-operator, various issues was produced during the months of spring pasture growth (September and October), while there occurred a noticeable downturn in production during the months of May and June. Shortfalls in the liquid milk market prior to 1955 were met through the purchase of extra supplies from outside the constituted Milk Zone. (3)

In 1955 the New South Wales Milk Board made another attempt to overcome the winter shortage of supply by introducing a system of individual quotas for farmers within the Milk Zone. This system was adopted by the Hunter Valley Co-operative Dairy Company in 1956, the individual quota being based upon milk output during the months of May and June. (4) Dairy farmers in the Paterson Valley were encouraged to increase their production during this qualifying period in order that total annual production might be increased.

The trend in monthly milk production changed from a regular pattern based upon spring glut and autumn/winter shortage, to one of numerous gluts and shortages throughout the year. The peak production continued to occur in October/November and again in January/February, but upturns in output also occurred in either May or June. The month of July became a period of low production and general downturn, largely because of its position relative to the quota qualifying period.

The trends in monthly milk production also reflect the trends in total annual milk production of the study area. The maximum monthly production occurred in January 1963 (3.4 million litres) and declined steadily until 1971. The minimum monthly production for the Paterson Valley is remarkable in its uniformity, falling below 1.6 million litres only in March 1965 and May/June 1970. This uniformity is due to the minimum quota requirements set by the New South Wales Milk Board in an attempt to guarantee whole milk supplies to the metropolitan market.

In conclusion, the dairy industry of the Paterson Valley has experienced similar trends to the New South Wales industry as a whole. This is reflected in declining dairy farmer numbers since 1955, declining dairy cattle numbers since the early 1960 s, declining annual milk production since the early 1960 s and, finally, increasing average annual milk production per farm.

SURVEY OF DAIRY FARMERS IN THE PATERSON VALLEY

The trends described for the dairy industry in the Paterson Valley and for the New South Wales industry as a whole, represent aggregated statistics of individual farmers. In order that the Paterson Valley might be studied more exactly a survey was carried out. The main aim of the survey was to determine the average scale of operations for the individual dairy farmer and possible future trends for the industry within the study area.

The sample was drawn from a list of farmers supplying the Hunter Valley Co-operative Dairy Company as at June 1980. The Paterson Valley was divided into three landform zones, as described in chapter one, in an attempt to collect data from the entire study area. A total of 19 interviews were carried out on a face to face basis, the response rate being 100%.

The survey asked the following questions:

(a) How many cows are you currently milking?

(b) How many cows do you usually milk?

(c) What is the size of your total dairy herd (including dry cows and replacement heifers)?

(d) How many beef breeding stock are you currently running?

(e) What is the size of your whole milk quota with the Dairy Industry Marketing Authority (in litres per week)?

(f) Will you continue dairying in the next 5 years?

(g) What do you consider are your viable alternatives to dairying?

SURVEY RESULTS

(i) Number of Cows and Heifers being Milked as at March, 1981.

The mean value of the sample is 48.58 milking cows per dairy farm, although the values range from a minimum of 20 cows to a maximum of 85 cows. The sample is too small to correspond exactly to a normal distribution, with 58% of the values falling within one standard deviation of the sample mean. However, 95% of the values occur within two standard deviations of the sample mean and all the values occur within three standard deviations of the mean.

There is a 95% degree of confidence that the mean of the total population will fall in the range of 42 and 55 cows.

(ii) Number of Cows and Heifers usually Milked

The mean value of the sample is 50.7 cows per farm, although the values range from a minimum value of 20 to a maximum of 95 cows (the current herd size per dairy farm has been reduced because of the 1979/80 drought which inhibited pasture growth and increased fodder prices). The sample approximates a normal distribution, with 68.4% of the values falling within one standard deviation of the sample mean, and 95% of the values falling within two standard deviations of the mean.

There is a 95% degree of confidence that the mean of the total population will fall in the range of 44 and 58 cows.

(iii) Number of Animals (Cows and Heifers in Milk and Dry, Replacement Heifers and Calves) in Dairy Herd

The mean value of the sample is 92.05 cows per dairy farm, although the values range from a minimum value of 49 cows to a maximum value of 175 cows. The sample again approximates a normal distribution with 63.16% of the values falling within one standard deviation of the mean, and 95% of the values falling within two standard deviations of the mean. All of the values fall within three standard deviations of the mean.

There is a 95% degree of confidence that the mean value of the total population will fall in the range of 77 and 107 cows.

(iv) Quota to Supply the Dairy Industry Marketing Authority

The mean value of the sample is 2606 litres per week per dairy farm with the values ranging from a minimum of 1103 litres per week to a maximum of 5000 litres per week. The sample does not resemble a normal distribution, with 73% of values falling within one standard deviation of the mean.

There is a 95% degree of confidence that the mean value of the total population will fall in the range of 2135 to 3076 litres per week per dairy.

(v) Number of Beef Cattle

The mean value of beef breeding stock kept on dairy farms in the sample is 21 cows, although taken by itself this average is misleading. Seven farms (37%) kept no beef cattle at all and a further 3 farms (16%) kept only 6 cows. The largest beef herd, on the other hand, totalled 100 breeding cows. In general, dairy farmers in the sample suggested that their beef stock have been reduced in number as a direct result of the 1979/80 drought, the animals being sold in preference to purchasing fodder for hand-feeding.

The largest beef herds in the sample belong to dairy farmers located in the north of the Paterson Valley, or in the valleys drained by smaller creeks and streams. Those dairy farms with small beef herds are found close to the Paterson and Allyn Rivers, being very specialised farming enterprises with intensive cultivation of large river flats.

(vi) Alternative Farming Enterprises

Four farmers (or 21% of the farmers surveyed) have broiler chicken sheds on their properties. The sheds are built by Steggles Pty. Ltd., and this company also provides the chickens, the feed concentrates, and the processing facilities for the farmer on a sub-contract basis. Until recently the chicken meat industry in the study area has been expanding as a direct result of increased prices for red meat. However, the current situation is one of under-utilised capacity with up to 4 weeks between emptying the shed of grown chickens and refilling the shed with a replacement batch. Another major problem seems to stem from increased prices charged for feed concentrates as a result of the 1979/80 drought.

Six farmers (or 32% of the sample) had no sideline activities. These men had no other agricultural interests (such as beef production, broiler chicken production or pig meat production) or off-farm employment in manufacturing or tertiary industry. These specialised farmers also tend to have smaller quotas (less than 3000 litres per week) and smaller milking herds.

Three farmers (16% of the sample) suggested that they would be giving up dairying in the near future. These men have alternative enterprises already established on their farms, namely broiler meat chicken production and specialised beef production. Three small-scale farmers have suggested that they will remain in dairy farming for at least five years, undoubtedly because they have no viable alternatives to dairying. However, if any of these smaller farms were sold by their present owners, it is unlikely that they would be carried on as viable dairy farming enterprises.

Only three farmers intend to purchase additional quota in the near future, the other sixteen farmers believing that their existing quota will be hard enough to maintain if the drought continues into summer. All farmers interviewed suggested that surplus milk for manufacture would only be produced during periods of natural pasture growth, when milk production is increased without an increase in herd size and without purchasing fodder. The high cost of purchased concentrates makes surplus milk production unprofitable during periods of unfavourable weather.

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(3) March,Doug (1965), page 196

(4) The Co-operator, June 1957, page 2

CHAPTER 3

ECONOMIC REASONS

for the

DECLINE IN THE DAIRY INDUSTRY

In Chapter 2 the dairy industry in the Paterson Valley was described for the period between 1945 and 1980, with the suggestion that trends in the local industry are very similar to those for the Hunter Region and for New South Wales as a whole. Dairy cow and dairy farm numbers and milk production statistics all mirrored the initial expansion and subsequent decline in the dairy industry between 1945 and 1980. It was also shown that the dairy industry was merely a more recent example of the way in which farmers attempt to maximise their returns from their agricultural activities.

In this chapter the main reason behind the growth and eventual decline in the dairy industry will be put forward. This will explain the reason why dairy farmer numbers expanded until 1955 and dairy cattle numbers until 1962, and why there was a general decline in the industry in the twenty years between 1960 and 1980.

The main reason behind this widespread decline in the dairy industry has been defined by many writers but is summarised by D.N. Crowfoot (1974) **(1)** when he suggested that "until 1960 the return per pound of butter remained static or even declined in relation to the input costs, which caused farmers to leave the industry". In the Hunter Valley Co-operator (1969) **(2)** the suggestion was advanced that "for years the industry has had to absorb constantly rising costs of materials and labour with no means of redress ... and it has seen other industries pass on these increases to customers and consumers and has felt the impact itself in higher prices for the goods, plant and services it has to buy".

INDICES OF COSTS AND PRICES

In order that relative increases in both costs and prices affecting the dairy industry could be quantified a series of indices have been prepared. These show the relative increases in the prices paid by farmers for goods and services, in the Consumer Price Index or the cost of living and, finally, in average weekly earnings, representing the wage rates paid by farmers and the alternative rates of remuneration that farmers (or their children) would receive if they were not involved in dairying. On the other hand, prices received by farmers for their products have been represented by the minimum producer price paid for whole milk and suppliers' pay for manufacturing milk. (Refer to Tables 3.1, 3.2, 3.3, 3.4, & 3.5 and Figure 3.1) (3)

RETURNS FROM LIQUID AND MANUFACTURING MILK

Between 1945 and 1952 the increase in producers' pay was considerable as a result of large price rises in both whole milk and manufacturing milk. On the index the price of whole milk increased from 5.9 to 9.2 cents per litre between 1951 and 1952 whilst manufacturing milk increased in price from 2.8 to 4.0 cents per litre. These price rises were associated with the strong demand for dairy products in the immediate post-war period, on the domestic and international markets. Australia also enjoyed a favourable cost structure between 1945 and 1952 relative to our international competitors. (4)

However, from the farmers' point of view the important fact is that whole milk producers received no substantial price increases or adjustments until 1966 when the price was increased to 10.8 cents per litre. This price rise was a result of the severe drought which occurred between 1964 and 1966 and caused farmers considerable hardship. However, it is unlikely that this price increase was of sufficient magnitude to compensate the farmer for his lost income. There was no compensation for the introduction of individual quotas in 1955 which made the output of an eight week period in May and June the basis of the farmers' yearly production quota. This system was seen as more expensive because it encouraged the farmer to maintain his milk output in what was traditionally a period of high production costs. (5) Between 1960 and 1963 the price received by the farmer for whole milk fell in both absolute and real terms - from 9.5 cents per litre in 1960 to 9.2 cents per litre in 1961.

Since 1945 the price for whole milk has been set above the price for manufacturing milk, providing an incentive for dairy farmers producing for the metropolitan market, who are required to maintain

TABLE 3.1 **Index of Prices Paid by Farmers**

AS AT JUNE 30	INDEX
1952	100.0
1953	105.1
1954	106.3
1955	107.6
1956	108.9
1957	115.2
1958	120.3
1959	119.0
1960	121.5
1961	125.3
1962	126.6
1963	127.8
1964	127.8
1965	131.6
1966	139.2
1967	144.3
1968	149.4
1969	151.9
1970	153.2
1971	159.5
1972	168.4
1973	181.0
1974	208.9
1975	272.2
1976	278.7
1977	355.7
1978	392.4
1979	424.1
1980	468.4

Source: Bureau of Agricultural Economics, 1980

TABLE 3.2 **Consumer Price Index - Sydney**

AS AT JUNE 30	INDEX
1952	100.0
1953	108.7
1954	110.5
1955	111.3
1956	115.0
1957	122.8
1958	124.6
1959	125.3
1960	128.1
1961	132.7
1962	133.2
1963	133.9
1964	135.4
1965	140.0
1966	144.7
1967	148.1
1968	152.9
1969	157.3
1970	163.85
1971	173.0
1972	187.0
1973	198.4
1974	224.1
1975	260.9
1976	294.8
1977	330.9
1978	360.3
1979	391.7
1980	433.2

Source: Australian Bureau of Statistics

TABLE 3.3 Average Weekly Earnings Per Employed Male - Sydney

AS AT JUNE 30	VALUE ($)	INDEX
1952	29.00	100
1953	31.00	108.8
1954	33.00	117.1
1955	35.00	122.8
1956	37.00	129.8
1957	39.00	136.8
1958	41.00	143.9
1959	42.30	148.4
1960	45.70	160.4
1961	48.10	168.8
1962	49.10	172.3
1963	50.20	176.2
1964	52.60	184.6
1965	56.50	198.2
1966	58.60	205.6
1967	63.30	222.1
1968	66.70	234.0
1969	72.30	253.7
1970	78.50	275.4
1971	87.30	306.3
1972	95.90	336.5
1973	104.30	365.9
1974	121.00	424.6
1975	151.90	533.0
1976	172.10	603.8
1977	193.60	679.3
1978	212.80	746.7
1979	230.20	807.0
1980	253.70	890.2

Source: Australian Bureau of Statistics, *Monthly Summary of Statistics*, Various Issues.

TABLE 3.4

Minimum Producer Price For Wholemilk – Hunter Valley Co-operative Dairy Company

AS AT JUNE 30	PRICE PER LITRE (CENTS)	INDEX
1952	9.16	100.0
1953	9.16	100.0
1954	9.16	100.0
1955	9.16	100.0
1956	9.16	100.0
1957	9.47	103.4
1958	9.47	103.4
1959	9.47	103.4
1960	9.45	103.2
1961	9.17	100.1
1962	9.16	100
1963	9.16	100
1964	9.54	104.1
1965	9.54	104.1
1966	10.79	117.8
1967	10.79	117.8
1968	10.79	117.8
1969	10.95	119.5
1970	10.95	119.5
1971	11.31	123.5
1972	11.88	129.7
1973	12.47	136.1
1974	13.81	150.8
1975	17.28	188.6
1976	18.75	204.7
1977	18.75	204.7
1978	20.61	225.0
1979	22.43	244.9
1980	22.81	249.0

Source: Hunter Valley Co-operative Dairy Company, The Co-operator, various issues and Dairy Industry Marketing Authority. 1980

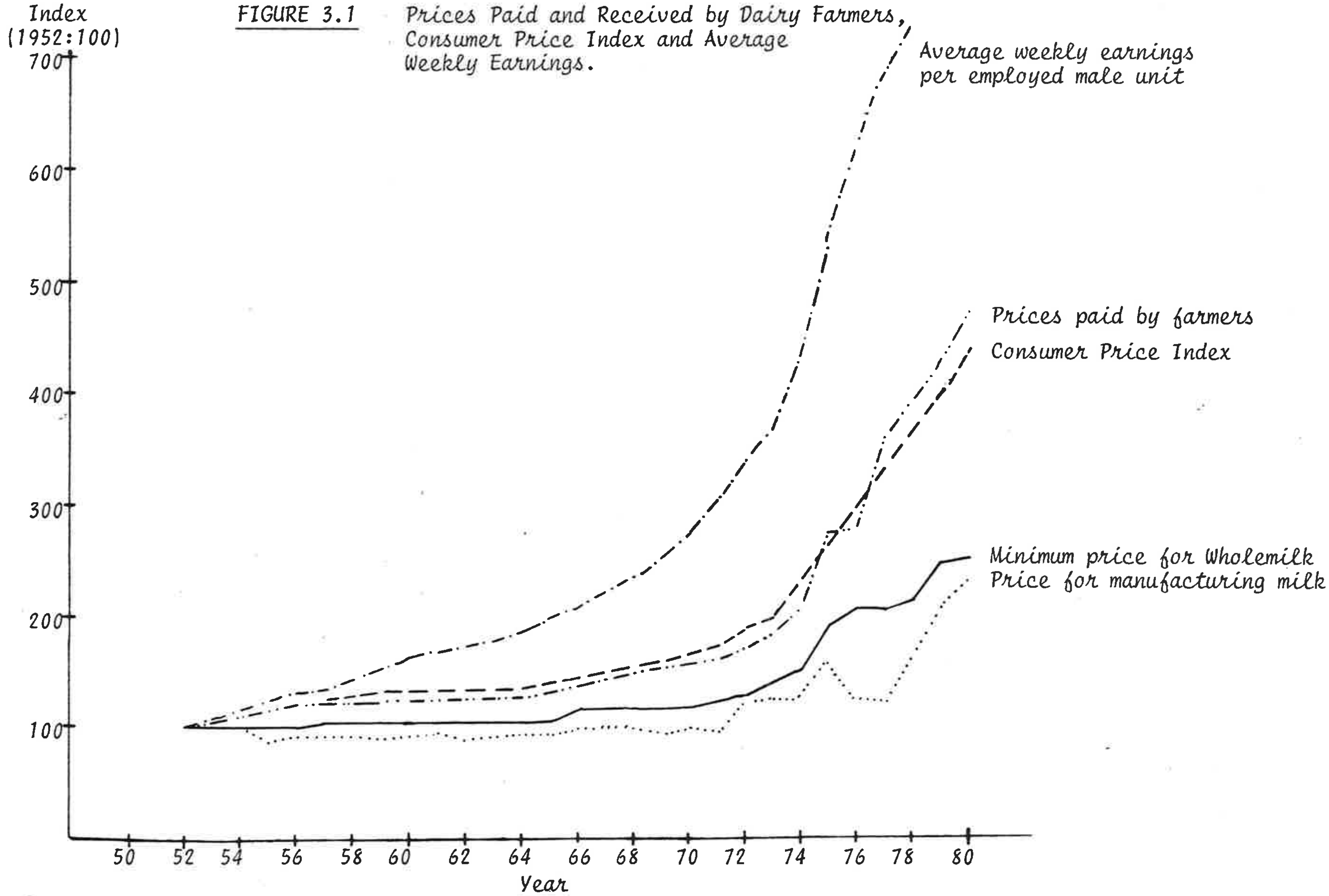
TABLE 3.5

Suppliers Pay For Manufacturing Milk – Hunter Valley Co-operative Dairy Company

AS AT JUNE 30	PRICE PER LITRE	INDEX
1952	4.03	100.0
1953	4.40	109.1
1954	4.18	103.7
1955	3.52	87.3
1956	3.65	90.5
1957	3.67	91.0
1958	3.67	91.0
1959	3.59	89.1
1960	3.72	92.3
1961	3.74	92.8
1962	3.59	89.1
1963	3.59	89.1
1964	3.81	94.5
1965	3.81	94.5
1966	3.96	98.2
1967	3.96	98.2
1968	3.96	98.2
1969	3.70	91.7
1970	3.88	96.2
1971	3.70	91.8
1972	4.84	120.0
1973	5.00	124.0
1974	5.02	124.5
1975	6.26	155.3
1976	5.02	124.5
1977	4.84	120.0
1978	6.44	159.7
1979	8.22	204.4
1980	9.20	228.2

Source: Hunter Valley Co-operative Dairy Company, *The Co-operator*, Various Issues.

FIGURE 3.1 Prices Paid and Received by Dairy Farmers, Consumer Price Index and Average Weekly Earnings.



Source: Tables 3.1. 3.2. 3.3. 3.4. and 3.5

output all year round. However, the producers of the Paterson Valley, who were within the New South Wales Milk Zone throughout the period, were never able to get more than 70% of their total output away to the more lucrative whole milk market. The price which they received for their surplus milk was dependant on the existing supply and therefore varied from month to month and from year to year. (6)

The price paid for manufacturing milk reached a maximum at 4.4 cents per litre in 1953 and for the next 19 years fluctuated markedly, the lowest price received being 3.5 cents per litre in 1955. In 1972 the price increased to 4.8 cents per litre due to the shortage of surplus milk caused by the withdrawal of dairy farmers from the industry and, consequently, by a downturn in total milk production. The 1970's have also witnessed real falls in the price of manufacturing milk which reached as low as 4.8 cents per litre in 1977.

COSTS AND WAGE RATES

The index of prices paid by farmers shows that costs have continued to rise even when the price of milk has remained stable or even declined. Only in 1958/59 did the index of prices paid by farmers show a slight decline. By 1960 the prices paid by farmers had increased by 20% whereas the returns received by farmers had stagnated or declined. Overall, in the thirty years between 1950 and 1980 prices paid by farmers have increased by 400% whereas prices received from both whole milk and manufactured milk have increased by less than 150%.

Overall, the Consumer Price Index or the cost of living has also increased at a rate faster than the returns from whole milk and manufacturing milk. During this time the dairy farmer was also coming to rely on the market system to a greater degree for the provision of his basic groceries, clothing, furniture, carpets and other household items. Farmers became progressively less self-sufficient and have had to pay for goods whose price has increased at a faster rate than their income.

The average wage rates have also been indexed for the thirty years between 1950 and 1980 for two major reasons. Firstly, although most dairy farmers in the Paterson did not employ outside labour but used the labour of their family, this family labour should be considered a cost of production. (7) Unfortunately, primary producers in general have a tendency to pay for other farm inputs and then take the income remaining as their wage. For this reason the level of wages accepted by the farmer and his family has continued to decline as farm costs increase at a faster rate than prices received for milk products.

The second reason relates to the fact that a regular indexed weekly wage and a 40 hour working week is clearly an attractive alternative to dairy farming, especially for the farmer's children. Having experienced the constant 12 hours per day, 7 days per week demands of dairy farming and the unpredictable hazards of flood, fire and drought, and all for little or no monetary return, rural children are often attracted to the apparently easier life and better remuneration of secondary and tertiary industry.

The dairy industry seems to have declined because prices received for both manufacturing and liquid milk have not kept pace with increases in farm costs and general costs of living. In 1980 the indices for minimum producer price for whole milk and suppliers pay for manufacturing milk stood at 249.0 and 228.2 respectively. The index of prices paid by farmers, on the other hand, stood at 468.4 and the Consumer Price Index was 433.2. This is a very graphic example of the disparity in costs and prices which faced dairy farmers in the Paterson Valley between 1945 and 1980. (Refer to Figure 3.1).

Furthermore, the constant increases in average weekly earnings (in 1980 the index stood at 871) has meant that wages in the secondary and tertiary sectors are relatively more attractive, especially as minimum wage rates are adjusted at regular intervals to keep pace with the cost of living.

THE IMPORTANCE OF GOVERNMENT INTERVENTION

There is another cause of this disparity in costs and prices which stems from the fact that the dairy industry is heavily regulated by government instrumentalities at both the state and national levels. In this regard the Australian dairy industry is not unlike other domestic rural industries which rely heavily on bounties, subsidies, import restrictions and tariffs. However, the dairy industry has tended to rest on its tradition as a major employer of labour and earner of foreign revenue, to develop and maintain a strong industry lobby group.

Early government legislation was formulated to regulate the quality of milk produced and sold on both the domestic and export markets. The most important government legislation before 1945 was the Paterson Plan of 1926, which attempted to place a bounty on all butter exported to ensure that producers on both the domestic and international markets received equitable prices for their processed milk products. The Australian dairy industry also received protection from domestic competition through the restriction of domestic production of margarine and other vegetable oils. **(8)**

During the 1940's the industry was assisted by protective measures in the form of the Dairy Industry Assistance Act of 1942. This legislation ensured that producers received a minimum return of 17½d per pound, which was later increased to 2 shillings per pound. This guarantee of minimum price for producers was continued until 1973/74, and also took into account the revenue lost from international monetary devaluations. **(9)**

As a result of these measures aimed at financial support of producers the price of Australian dairy produce was kept well above the price that would have been expected under conditions of the free market. **(10)**

In particular, this was the case because the domestic market was protected from foreign competition and also because exports on the international market were highly subsidised by the Australian consumer. On the international market the Australian producer was at a price disadvantage compared with his competitors in New Zealand and Denmark. The Australian natural environment made the production costs of our product relatively higher and therefore would have made our dairy exports uncompetitive. (11)

The direct result of these numerous price support schemes and other protective measures was that the dairy industry remained profitable for longer, even when the free market system and costs and returns would have indicated a decline in the industry. These measures allowed dairying to expand into environmentally marginal areas and, furthermore, allowed inefficient producers to remain in the industry long after they would have been able to do so under normal conditions. (12)

Drane and Edwards (1961) have suggested that government intervention has resulted in the chronic malaise of oversupply. (13) Price rises resulting from government protection have caused the dairy industry as a whole to increase its output in order to take advantage of the extra income. However, costs also tended to rise due to the introduction of more marginal producers and the intensification of land use, and because the extra produce was sold at lower prices on the export market.

When these protective measures such as government subsidies are reduced or are no longer successful in maintaining a "sufficient" price for milk products, farmers are sometimes willing to accept low incomes rather than leave their properties. (14) This "stickiness of exit" is maintained by farmers who consider that dairying is a way of life and are unskilled or unable to find ready employment in other primary industries and in secondary and tertiary industry. These producers were slow to leave the industry and added to the worsening situation of oversupply and diminishing returns whilst expecting the government to proffer higher levels of assistance.

THE PROBLEM OF DEMAND

The Australian dairy industry has also been handicapped by other problems on both the domestic and international markets which have reduced the demand, and hence the price for Australian dairy products. Butter, once the biggest single component of milk processing, has been suffering a serious decline in popularity due to increasing concern about cholesterol levels and, secondly, due to increasing competition from vegetable oils since the ban on margarine production was lifted in 1970. Since 1945 butter consumption has also declined due to the fact that migrants to Australia from southern Europe have not been butter eaters. **(15)**

There occurred a major decline in the export market when the major buyer of Australia's dairy produce, Great Britain, joined the European Economic Community. **(16)** Australia's other buyers were relatively minor consumers of our more traditional dairy products (mainly butter and cheese) and were located in the Middle East and in Asia.

The best indications of future success stem from the increased consumption of new-generation dairy products on both the export and domestic markets. **(17)** On the international market the success of our industry rests with exports of powdered milk, casein and ghee to the expanding Asian markets. The Australian market will continue to expand in the consumption of exotic cheeses, cottage cheese, yoghurts, custards, long-life and flavoured milk. These marketing developments may help to maintain producer price in the dairy industry.

In conclusion, the dairy industry of the Paterson Valley has suffered a serious decline since 1955 due to unfavourable developments in milk prices relative to farm costs, cost of living and average weekly earnings. Of particular relevance is the comparison between prices paid by farmers and prices received for both liquid and manufacturing milk. This problem of declining returns caused the number of dairy farmers to decline after 1955 and a more widespread industry decline after 1960. However, the problem must be seen in the context of government protection which has buoyed up production, thus blurring the interplay of demand and supply forces, and has also allowed high-cost producers to remain in the industry.

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(6) March, Doug, (1965), page 195

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(17) Pyle, W.H. (1980), page 78

CHAPTER 4

OTHER REASONS BEHIND THE DECLINE

in the

DAIRY INDUSTRY

In chapter 3 the decline in the dairy industry of the Paterson Valley and for the whole of New South Wales was explained in terms of increasing costs relative to increases in milk prices. In summary, between 1945 and 1980 returns from both whole milk and manufacturing milk increased at a relatively slower rate than such farm costs as wages, fuel and fertilizer prices, electricity charges and fodder prices. The returns from the dairy industry were heavily dependant upon price support schemes and other protective measures which created an unnatural market situation, resulting in an oversupply of milk and the development of high cost producers in marginal areas.

In this chapter other reasons behind the decline in the dairy industry will be examined. However, it will become obvious that these reasons are also intricately connected with the overriding sustained decline in producer returns.

Firstly, it is widely recognised that some farmers, whatever their main type of production, will remain in farming even after the industry becomes unprofitable and they are experiencing declining returns. (1) This rests with the fact that farming has traditionally been a "way of life", with farmers receiving many intangible benefits which cannot be measured in terms of money. These advantages include freedom to determine their own work schedule, the open space and beauty of their workplace and, finally, the dream of carrying on a family tradition.

The primary producer has also received other benefits which can be measured in economic terms. (2) These include income taxation deductions on such things as depreciation, motor vehicle registration, fuel, fertilizer, telephone and electricity. It also includes the savings gained from the consumption of home grown vegetables, fruit milk and meat.

OLD AGE, ILLNESS AND DEATH

The first major non-economic cause of the decline in dairying is that the farmers are generally becoming older and less able to cope with the demands of the industry. (3) Traditionally, the farmers' children eventually took over from their fathers after gaining several years experience and practical training on the family farm. However, with diminishing returns gained from dairying, farmers' sons and daughters have sought better working conditions and higher remuneration in either secondary or tertiary industry. (4)

In this way the dairy farmer and his wife were left to run their enterprise by themselves with perhaps some part-time assistance from their children at weekends and during busy times. When the farmer became incapable of coping with the constant and long hours of dairying due to old age or ill-health the farm was often sold or the dairy enterprise discontinued.

The death of a dairy farmer or operator was similarly a common reason for a farm being withdrawn from the industry. (5) Again, the absence of young people willing to carry on the industry meant that there was no real alternative but to sell the farm. This sometimes even happened after the farmer's son had returned from alternative employment but consequently found that the effort required to operate the farm was not justified by the prices received for milk products.

The farmer's wife often exerted not inconsiderable influence in the dairy farmer's decision to leave the industry. (6) Usually resenting the constant demands of the industry whilst desiring a more leisurely lifestyle, the farmer's wife was able to influence her husband merely by threatening to withhold her labour from the dairy enterprise. In these cases, the farm might be sold or, more commonly, because the wife was not objecting to rural life itself, the dairy enterprise was replaced by a less demanding alternative.

The problem of declining returns is certainly an important reason in explaining why the farmer's children did not stay in dairying, but it is also important to realise that it is not the only reason. In some cases the inability of farmers and their children to work together or co-operate in the operation of the farm is an important reason for the latter choosing employment in other industries.

However, the eventual result was usually the same - that old age, ill-health or death eventually forced the farm to be withdrawn from the dairy industry.

CHANGING ATTITUDES TOWARDS WORK AND LEISURE

The changing attitude of our society as a whole has also caused or encouraged farmers to leave the industry, particularly with regard to leisure time, holidays and the 40 hour working week. W.H. Pyle (1980) suggests that "working seven days per week, milking large herds twice daily with the inevitable restriction on family life, social and cultural enjoyment and recreation, all for nil return to capital" is becoming unacceptable even in the Australian farming community. **(7)**

The solutions taken up by farmers range from the obvious, including changing to a less demanding agricultural pursuit or alternative employment in other industries. The second alternative is that some farmers are reducing their herd size whilst remaining in dairying and thus allowing themselves more leisure time. **(8)** This alternative is likely to become more popular in the future as farm amalgamations allow economies of scale and also enable two or three farmers involved to take regular holidays, have specified times away from the farm and to even take sick leave if necessary.

EDUCATION AND EMPLOYMENT

One of the major problems with dairy farmers in the Paterson Valley has been that they have few formal educational qualifications and almost universally have no trade or work experience other than farming. **(9)** After leaving school at fifteen these farmers worked on their father's farm or in the local district until they gained ownership and control of their dairy farm. However, this lack of formal qualifications and the problem of advancing years has meant that farmers leaving dairying have few alternatives open to them.

However, the dairy farmer's lack of education and formal qualifications has often resulted in either he or his wife encouraging their children to continue on at school and then find some kind of formal training such as apprenticeships. (10) They often allow their children to concentrate on studying and homework rather than assisting with dairy chores in the hope that it will bring them a better life and an easier occupation. Rural children are actively encouraged to seek alternative means of employment by their parents, the result being that with advancing age the farmer himself will be forced to leave the industry.

BULK MILK COLLECTION

One of the common arguments put forward to explain why dairy farmers left the industry in the late 1960's and early 1970's was the change-over from can collection to refrigerated bulk milk collection. The original system operated by the farmer saw him put either milk or cream into a 10 gallon can and transported it from the milking shed to a roadside stand. The milk was then picked up by a contract carrier and taken to the factory. This system was expensive in terms of time taken to transport the cans to the roadside and in cleaning the cans, and demanding in that the dairy farmers had to maintain a strict timetable to catch the carrier.

The bulk milk system operated by the farmer meant that milk was placed directly into an electrically driven vat to be cooled. The milk was collected later in a refrigerated truck/tanker and taken to the factory. The main advantage of this system was that the milk could be collected at any time without the assistance of the farmer, thus saving both time and effort in getting the milk to the roadside.

The advent of bulk milk collection caused many farmers to leave the industry because they believed that with declining or stable real returns and with advancing ages, they had little hope of recouping the initial outlay on the new vat, connecting electricity to the milking shed, structurally changing the shed to accommodate the new equipment and constructing an all-weather road from the public road to the milking shed. (12)

The problem of changing over to bulk milk collection was a particularly serious one for those farms to which access was difficult. By 1970 most of the main (public) roads in the study area were all weather ones. However, some farms were still located considerable distance from main roads and access roads sometimes crossed rivers via fords or low-level bridges. These could be frequently isolated by sudden rises in river height.

When the milk was collected in cans a flying fox was often used to bridge the river in times of flood. The advent of refrigerated bulk vats meant that the bulk tanker would not be able to collect milk from these farms in wet weather and so some farmers decided to leave the dairy industry. One dairy farmer at Eccleston, on the other hand, whose farm was located across a bridge incapable to taking the weight of a truck, had a refrigerated vat mounted onto a trailer which brought the milk to the roadside for the tanker to collect. However, when the bridge was washed away by floods the farmer left the industry.

REGULATIONS REGARDING HYGIENE AND INDUSTRY STANDARDS

At the same time as the introduction of refrigerated bulk milk collection was taking place in the Paterson Valley the Dairy Industry Authority was taking positive steps to tighten hygiene regulations and general standards in the dairy industry. Therefore, in the late 1960's and early 1970's many milking sheds and farm buildings in the study area were condemned or were threatened with condemnation unless extensive repairs were carried out. Again, with declining returns and with little chance of recouping the capital outlay in the immediate future, many farmers perceived that the rational choice was to leave the industry.

TRANSFERABLE MILK QUOTAS

After 1966 milk quotas became transferable and could be sold or leased separately from the land itself. (14) Previously, if dairy farmers wanted to expand their production they were forced to buy the real estate as well. This restricted expansion in quotas because farmers were often not prepared, or possibly could not afford, to purchase the extra land. When quotas became transferable between dairy farms supplying the same factories, farmers were able to easily leave the industry but remain on their land by taking up some other agricultural activities.

WEATHER CONDITIONS

Another non-economic reason which has forced farmers to leave the dairy industry is that of unfavourable weather conditions. In this light, the threat of floods has often caused dairy farmers extreme hardship through the loss of animals, pasture, irrigation, plant and riverflat erosion and also as a result of temporary isolation and dislocation. These problems are particularly important where a high percentage of the dairy farm is low-lying and within flood reach (which is commonly the case below Vacy) and also where access to the farm is across low-level bridges or fords.

On the other hand, drought is certainly a more drawn-out condition and therefore leaves more time in which the farmer can prepare for it. This may involve storing hay and silage, building extra farm dams, buying extra irrigation plant, decreasing the stocking ratio through culling or buying extra land. However, droughts also tend to last for much longer periods of time and can cause more serious long-term problems. These include stock deaths as a result of starvation and malnutrition, shortages of fodder (both natural and stored) and a shortage of water.

However, dairy farmers are more likely to try and sit out these natural catastrophes through bank loans and other bridging loans rather than sell out at the time. The reason behind this is that during such conditions, and especially during droughts, both land and stock markets experience depressed prices. Dairy farmers are more likely to sell their properties after the weather conditions have returned to normal and market prices are increased.

WATER AVAILABILITY

The last non-economic factor which is related to weather conditions is that of water availability for both irrigation purposes and general farm use. It is evident from the maps that most of the farmers on intermittent streams and smaller creeks and gullies have left the industry. The only remaining pockets of these farms are at Hilldale and Lewins Brook, the majority of farms being located on either the Paterson or Allyn Rivers.

In this light, the construction of the Lostock Dam on the Paterson River has not stopped farmers leaving the industry. In 1970 there were 52 farmers on the Paterson River and by 1980 this had declined to 26, a decrease of 50%. On the Allyn River in 1970 there were 51 farmers and this number had decreased by 35% in 1980 to 33. Therefore, the farmers on the Allyn River, with restricted supplies of water and sometimes suffering serious shortages during periods of drought, have not gone out of business at a substantially faster rate than those on the Paterson River. This may be due to the fact that farmers have not made maximum use of water stored in Lostock Dam, as was predicted by Russell Richmond in 1970. (15)

The major point that should be made about water availability is that those farms which are on intermittent streams and creeks and have to rely on limited supplies of water from farm dams (Lewins Brook and Hilldale) and those on the Allyn River which have access to restricted supplies of water during dry times, will probably not remain as dairy farms if sold by the present owners.

In conclusion, the other reasons for the decline in the dairy industry are all connected with the fact that farmers have experienced falling real returns in the 30 years after 1950. These reasons include advancing age, ill-health and death of dairy farmers, farmers' children gaining employment in secondary and tertiary industry, bulk milk collection and tightening of industry standards and, finally, availability of guaranteed supplies of water.

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CHAPTER 5

ALTERNATIVES TO DAIRY FARMING

in the

PATERSON VALLEY.

In previous chapters the decline in the dairy industry in the Paterson Valley has been described in terms of diminishing dairy farm and dairy cattle numbers and decreasing total milk production. The reasons behind this localised decline have been defined and include falling real returns, aging of farmers, a widespread desire for an easier working life and the movement of farmers' children away from rural areas to employment in urban-based secondary and tertiary industries.

The decline in the dairy industry over the last 35 years in the Paterson Valley has not left the countryside vacant or unused and the area is now occupied by a number of different alternative activities, of which dairy farming is only one example. Some of these activities have a long history of operation in the Paterson Valley, whilst others are relatively new, being introduced as a result of new economic conditions and changing technology.

In this chapter these alternative forms of land-use will be examined in detail. Their growth, and frequently their periods of stagnation or decline, will be contrasted to the sustained decline of the dairy industry. However, the most important fact is that farmers are not <u>always</u> motivated by the desire to maximise their profits. In this light, alternative enterprises generally represent a more efficient way of maximising returns relative to the amount of effort and time expended.

The dairy industry is characterised by specific items of capital equipment which cannot be easily adapted for other types of agricultural activities. The power plant, the milking machines, the separator and the milk vats have often become idle after the dairy farmer left the industry. They have very little resale value because of the general decline in dairying. The milking shed and other buildings used in dairying are now being used for the storage of hay or as a garage for such items of farm equipment as ploughs, hay bailers or fertilizer spreaders. In many cases, the sheds are being left to deteriorate through lack of constant maintenance and attention.

BEEF

The major alternative which has been taken up by dairy farmers leaving the industry in the Paterson Valley is that of beef production, including the specialised activity of raising vealers. This form of land-use has the advantage that most dairy farmers have always kept a few beef cattle (for either commercial production or for the farm meat supply) and were therefore well trained, experiencing little trauma and very few problems in the changeover. Farmers were also able to build up their beef herd prior to giving up dairying and could use their dairy cattle as the basis of the new enterprise.

The dairy farmer often found that vealer production was the ideal alternative. Whilst dairying, the farmer kept heifer calves as replacement stock but separated them from his milking herd which was milked twice daily. In the production of vealers the calves were allowed to run with their mothers constantly until they were fat enough to sell at 12 months. The main advantages of vealer production have been that dairy cattle mated with beef bulls produced high quality vealers, dairy farmers were already used to a 12 month production cycle and, thirdly, vealer production was especially suited to small farms with high proportions of improved pastures on riverflats.

The dairy farms in the study area are relatively large, especially in both the Paterson and Allyn Valleys above Gresford, where the steeper topography and the smaller area of alluvial riverflat meant that dairy farms had to be larger to be economically viable. On these farms the steeper "back" country had always been used as dry runs for the dairy herd and for extensive beef cattle production. **(1)** Beef cattle were traditionally a common sideline for dairy farmers because they required only a minimum amount of supervision and utilised those parts of the holding unsuitable for dairy production.

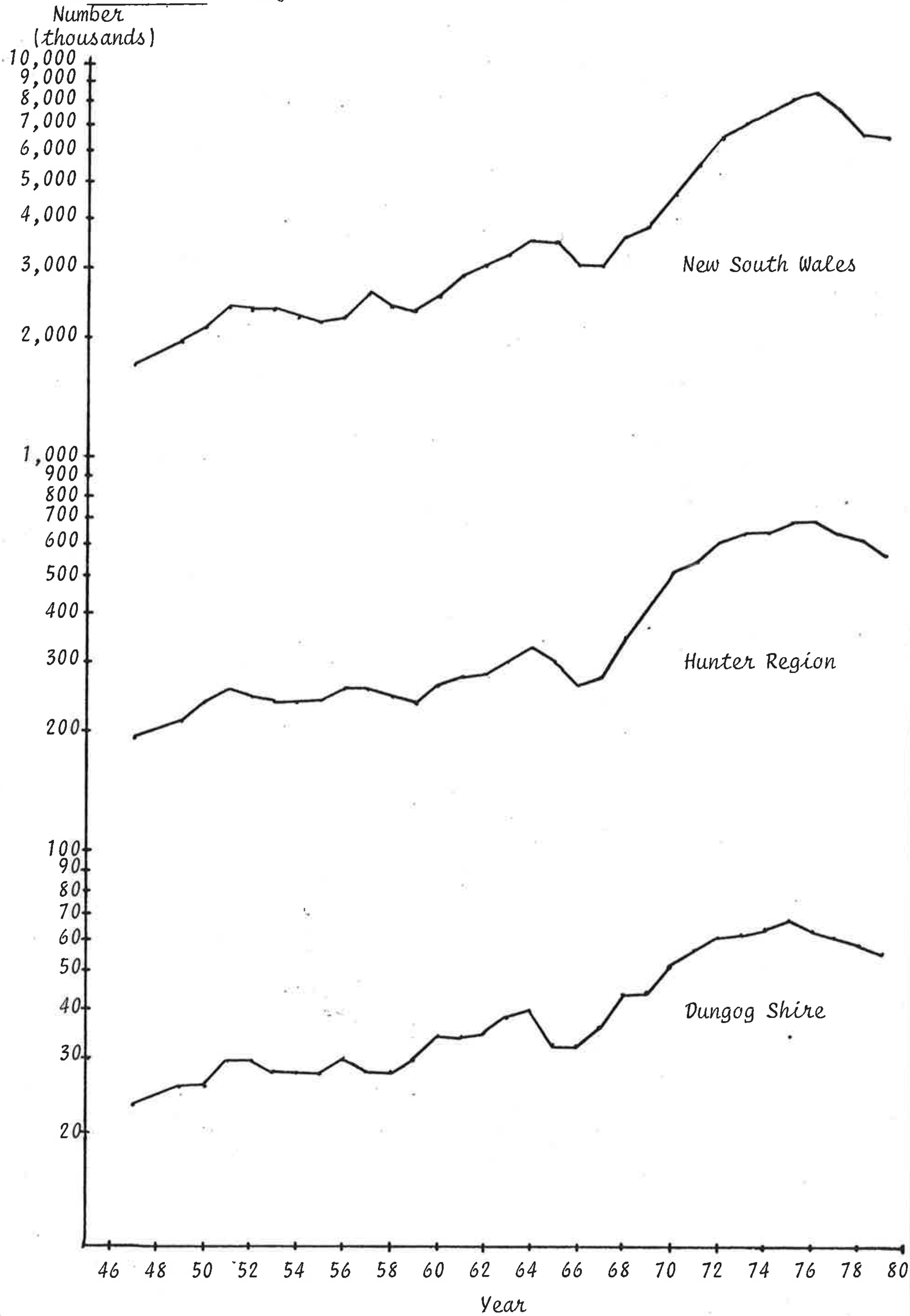
The final advantage of beef production to dairy farmers leaving the industry has already been described indirectly - the reduced amount of work involved. Aging dairy farmers and their wives found that the demands of dairying (often 12 hours per day, 6 or 7 days per week) were beyond their physical capabilities. This was made more difficult by the low returns from dairying relative to the effort and time expended, and by the shortage of either family or paid labour. (2) The grazing of beef cattle, and the production of vealers in particular, was far less physically demanding. Dairy farmers generally believed that the reduced work load and a more leisurely lifestyle more than compensated for the reduced and less regular income.

The main disadvantage in beef production occurred where holdings were too small or had insufficient back country to provide a viable economic unit. This was particularly the case in the Paterson Valley below Gresford where farms were generally smaller in size and where dairying was more likely to have been the only agricultural activity. (3) In these cases vealer production was likely to have been more important or other activities which will be discussed later in this chapter.

Throughout the study area, but particularly in both the Paterson and Allyn Valleys above Gresford, the retirment of farmers from the dairy industry has resulted in "Pitt Street" farmers from either Sydney or Newcastle buying properties. This has allowed some dairy farmers to leave the industry with very lucrative financial rewards that would have been impossible under more normal circumstances. The proximity of the Paterson Valley to Newcastle (1 - 1½ hours) and Sydney (3 - 4 hours) and the advantages of primary production with regard to taxation evasion has made the study area an ideal location for the establishment of "Pitt Street" farmers. However, this trend has also pushed Paterson Valley land values above the productive capacity of land itself and therefore has made it more difficult for the "traditional" farmer to either establish or enlarge his property.

Trends in the number of beef cattle in the Dungog Shire have closely followed trends in both the Hunter Valley and New South Wales.

FIGURE 5.1 Beef Cattle on Rural Holdings



Source: Australian Bureau of Statistics, Agricultural Census, 1947 to 1979

(Refer to Figure 5.1). Numbers increased steadily between 1949 and 1964, when a serious drought caused many stock deaths and a severe downturn in carrying capacity. Between 1966 and 1975/76 there occurred a dramatic increase in beef cattle numbers, the trend being halted by a severe depression in the export market, particularly that of the American market. Since 1976 there has been a continued downturn in cattle numbers due to unstable markets and unfavourable weather conditions.

THE BROILER INDUSTRY

The second most common alternative for dairy farmers leaving the industry, the broiler industry does not have a long history of operation in the Paterson Valley. In fact, the broiler chicken industry has its origins as a sideline to egg production, and has only become economically significant since the marked increase in the price of red meats in 1977/78. Prior to this date sheep and cattle meats were relatively inexpensive due to the depressed export market.

In the Paterson Valley there have been a few egg producers located around Paterson itself. These producers have been few in number and have been relatively unimportant in the economic life of the study area as a whole.

The broiler chicken industry experienced rapid growth due to its role as a producer of an inexpensive alternative to red meats. However, developments within the industry itself have allowed it to capitalise on this favourable consumer demand. The first of these developments concerned the reduction of the feed-conversion ratio, which is a measure of the efficiency of converting poultry food into meat. The conversion ratios have improved from 3.3:1 in 1960 to 1.95:1 in 1978. (4)

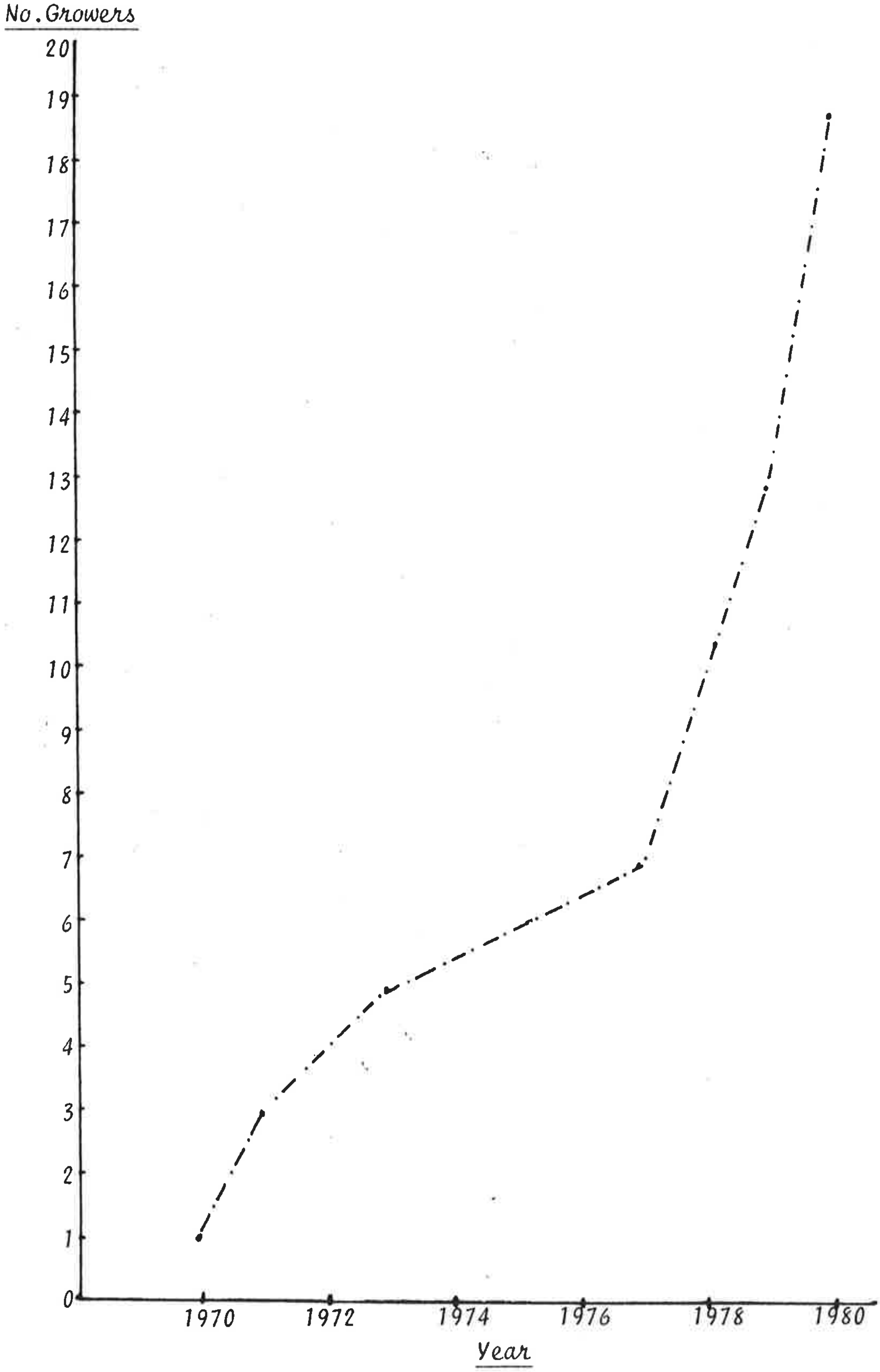
Other improvements in the industry which have resulted in a revolution in production techniques have included better genetic stock, improved disease control, higher stocking densities and higher batch throughput. These improvements have allowed the industry to keep costs of production at a minimum and have helped maintain efficiency. (5) In the foreseeable future it is unlikely that technological improvements will be so dramatic and this may restrict further expansion in the industry. Nowland (1978) suggests that the only scope for further expansion lies with cost reductions on individual farms. (6)

Broiler chickens are grown from day-old chickens to the age of seven or eight weeks. Individual farmers supply the shedding, equipment, litter and labour. Steggles Pty. Ltd., the only processor to have interests in the Paterson Valley, supplies the chickens and the chicken feed, and also often provides the credit for the construction of the sheds. The processor also sets production quotas based on market demand, thus determining numbers of chickens produced in any time period. (7) Steggles Pty. Ltd., also determines how many growers can enter or leave the industry and, therefore, can directly determine the rate of withdrawal from dairy farming and into broiler chicken production.

Numbers of producers involved in the broiler chicken industry have increased dramatically in the last five years. (Refer to Figure 5.2). This increase is also mirrored in the number of chickens which are produced annually in the Dungog Shire. (Refer to Figure 5.3) as recorded by farmers on the Agricultural Census. There seems to have been a slight downturn in the industry in the last 12 months to June, 1980. This is reflected in the longer periods of time between the marketing of one batch and the arrival of the replacement batch. At the height of the expansion in the industry this was as little as 3 or 4 days, but by 1980 this had increased to 4 or 5 weeks with restrictions on the construction of sheds and, therefore, the entry of producers into the industry. (8)

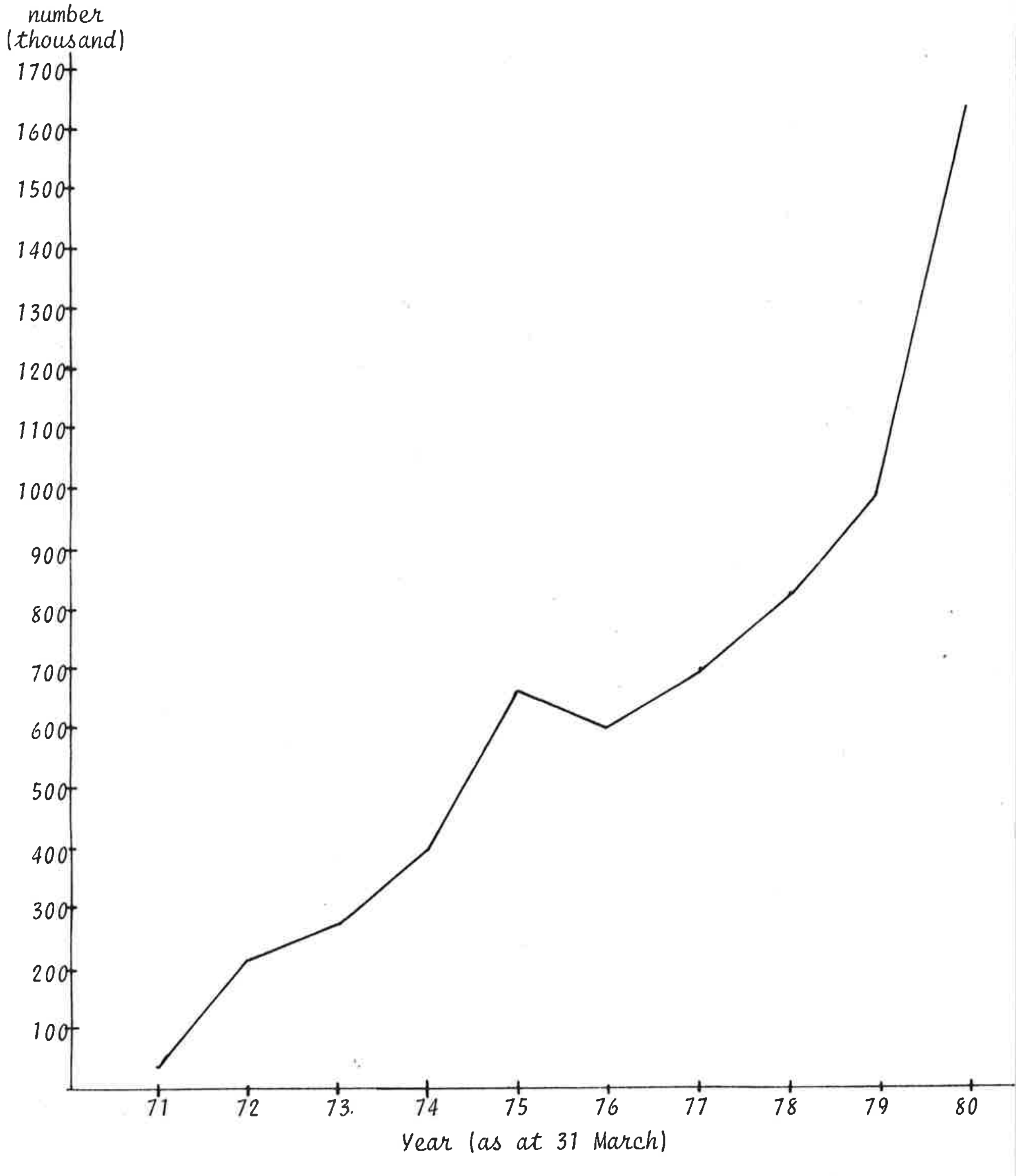
The broiler chicken industry is an alternative agricultural enterprise for dairy farmers below Gresford. There is currently a 40 kilometre limit from the processing plant which ensures that the delivery and collection of both chickens and feeds is a viable economic proposition. Furthermore, the income from one shed is insufficient to cover the initial outlay of capital. (9) A farmer with only one

FIGURE 5.2 Cumulative total number of farmers with Steggles' broiler chicken sheds in the Paterson Valley.



Source: Steggles Pty. Ltd., 1980

FIGURE 5.3 *Broiler Chickens Grown under Contract - Dungog Shire*



Source: Australian Bureau of Statistics, Agricultural Census of New South Wales, 1971 to 1980.

chicken shed, and who is experiencing difficulties in building another because of quota restrictions, might remain in the dairy industry until the demand for chicken meat again increases.

The main advantage in broiler chicken production is that it takes only two hours per day to feed and water the chickens. Only between batches does the work load increase as the litter must be cleared out and replaced before the arrival of the next batch. The broiler chicken industry also provides a viable alternative for dairy farmers in the lower Paterson Valley where properties are relatively smaller and where some form of intensive agricultural production is essential. Thirdly, the dairy farmer can have one chicken shed built whilst he maintains his dairy farm and, after proving that the broiler industry is a profitable proposition and is to his liking, he can then build another shed and give up dairying altogether.

HOBBY FARMS

A third major alternative means of land-use which now occupies land once devoted to dairying in the study area below Gresford is that of hobby farms or rural retreats. These properties range in size from 2 to 10 hectares and are largely sub-divided dry runs of former dairy farms. These farmlets are owned by men and women who seek the open spaces of rural living whilst remaining within easy commuting distance of their work in secondary or tertiary industry. The hobby farmers generally run a few cows, sheep, horses, goats and poultry and attempt to become self-sufficient in the production of their own fruit and vegetables.

The hobby farmers have provided a means by which dairy farmers can leave the industry with a relatively lucrative reward. On the other hand, farmers can also retain the best of their land by selling their former dry runs to the hobby farmers, thereby giving themselves the capital for retirement or semi-retirement. For the hobby farmer the proximity of the Paterson Valley to either Maitland or Newcastle is an advantage in terms to travelling to work, shopping or consuming other urban services.

The hobby farmer has come under sustained attack from both full-time farmers and academics. It is claimed that they promote weeds and pests, whilst allowing fences to fall into disrepair and animals to wander all over the countryside. It is also claimed that they produce goods of an inferior quality and underutilise their land because their income does not depend on it. **(10)** In the Paterson Valley, as is the case elsewhere, it is the absentee landowner who allows weeds and pests to flourish, fences to fall into disrepair. It seems that overall the hobby farmer is no more guilty of these crimes than is the full-time farmer.

Perhaps a more serious allegation is that the fragmentation of valuable rural land reduces its overall productive capacity and in the future will prevent the farming of viable economic units. **(11)** This is a very real problem but it should be easily solved through the institution of protection for highly productive agricultural and pastoral land. **(12)** This will entail co-operation between State government bodies (The Department of Environment and Planning) and local government authorities.

OTHER ALTERNATIVES

Other alternatives to dairy farming in the Paterson Valley are relatively unimportant. Horse studs have also been established by Pitt Street farmers with the capital necessary to construct training tracks, stables and fences. These are few in number and have not altered the overall complexion of the Paterson Valley. Commercial goat and sheep herds are also in existence but are economically unimportant in the study area as a whole.

In conclusion, the decline in the dairy industry in the Paterson Valley has not left the area vacant. The main alternative to dairying has been beef production, which has the advantage of being an activity familiar to dairy farmers and less demanding in terms of time and effort. Furthermore, resources used in dairy farming (cattle and land) can be utilised in beef production. The broiler chicken industry provides a viable alternative where the dairy farm is smaller in area and involves far less time and effort than does dairy farming. Finally, the sub-division of land for hobby farms provides a means by which dairy farmers can profitably leave the industry but also represents a very real threat to the maintenance of viable economic units on highly productive rural land.

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CONCLUSION

This thesis has examined the dairy industry of the Paterson Valley between 1945 and 1980 and has sought to explain why the industry has suffered a sustained decline in the twenty-five years between 1955 and 1980. The advantage of studying such a small area is that the components and trends of the industry can be examined in far greater detail than would be the case for a larger area.

The physical environment directly determines the nature of the dairy industry and also sets important constraints upon its development. Firstly, topography has a direct relationship with the size of dairy farm. In the northern section of the Valley the topography is characterised by steep slopes and narrow valleys, while in the southern section the topography is far more undulating, with low hills and broad valleys. Farms in the northern section are larger and have a smaller proportion of their area as riverflat and a larger proportion as hill country, than those in the southern section.

Rainfall also has a direct bearing on the dairy industry in the study area. The Paterson Valley is regularly affected by both droughts and floods, which place limitations on the industry. During late spring and summer the shortage of ground water retards plant growth and causes farmers to use irrigation, this being a serious limitation where water for irrigation is in short supply.

The Paterson Valley has been settled by Europeans since the early nineteenth century, and during this time commercial agriculture has been the major activity. Extensive cattle grazing, wheat, maize and tobacco cultivation and fruit and vegetable growing were very much influenced by movements in prices on both the domestic and international markets. In this light, for farmers in the Paterson Valley, dairying increasingly became a viable economic proposition after the 1890's due to technological improvements, including the mechanical separator and the hand-operated separator, improvements in transportation and in the road and rail networks, and, finally, changes in government legislation.

The most important item of government legislation affecting the dairy industry of the Paterson Valley was the establishment of the New South Wales Milk Zone in 1932. Although the study area was not fully included in the Milk Zone until 1942, it meant that farmers were paid a higher price for their liquid milk as an incentive to maintain milk production throughout the year. Therefore, in 1945 the farmers in the study area were experiencing a time of expansion as a result of the higher price they were receiving for their product.

The dairy industry in the Paterson Valley has experienced trends similar to the New South Wales dairy industry as a whole. However, problems experienced by farmers in the study area are probably more relevant to the area included in the former New South Wales Milk Zone than to the entire industry. Farmers outside the Milk Zone between 1945 and 1975 experienced more severe problems for they had no guaranteed market or price for their milk, but relied on fluctuating returns from milk and cream destined for manufacturing.

The dairy industries of the Paterson Valley and New South Wales displayed striking similarities in four main areas. Firstly, the number of dairy farmers registered with the New South Wales Milk Board increased between 1945 and 1955, but then steadily declined until 1971 when the Dairy Industry Marketing Authority was established. Since 1971 dairy farmers in the Paterson Valley, the area formerly within the New South Wales Milk Zone and New South Wales as a whole have declined in number.

The decline in dairy farmers has also been associated with general downturns in dairy cattle numbers and total milk production. However, these two industry variables reached their peaks in 1963 in the Paterson Valley, meaning that up until that time the milk production lost through producers leaving the industry was being made up of those farmers remaining in the industry. For New South Wales as a whole, milk production declined after 1962 but numbers of milk cattle peaked in 1956 and then remained relatively stable until 1964.

The dairy industry experienced downturns in cattle numbers and milk production despite an increase in the average annual milk production per farm between 1949 and 1971 in both the Paterson Valley and the former Milk Zone. This fact suggests that those farmers leaving the industry have been the smaller producers which has resulted in an automatic increase in average production. However, individual farmers may also have increased their output by using better dairy stock, improved pastures and irrigation, and by receiving increases in their quota to supply the Milk Board.

The reasons behind these trends in the dairy industry in the Paterson Valley and New South Wales as a whole are largely related to declining returns to producers after 1955. The post-war period saw a boom in Australian rural industries generally but also in the dairy industry. The domestic and international markets were buoyant due to increases in population, a lack of international competition and the Korean War. At this stage the Australian industry was also relatively competitive compared to other producers on the international market.

The main reason behind dairy farmers leaving the industry after 1955 was that costs facing producers increased at a relatively faster rate than did prices received for both liquid and manufacturing milk. This was particularly the case between 1952 and 1963 when prices for liquid milk not only remained stationary but had experienced a real decline. The price for manufacturing milk, on the other hand, remained static until 1972, experiencing periods of both increases and decreases depending on the supply of milk from throughout the state.

The costs facing the farmers, however, have continued to increase at a steady rate for the thirty years between 1950 and 1980. When compared with prices received by farmers, which increased by only 360%, the prices paid by farmers for such goods as fertilizer, fuel and fodder have increased by over 570% for the same period. To this end, dairy farmers in the Paterson Valley were experiencing falls in their returns after 1952 and it is this problem which has largely caused producers to leave the industry.

However, it is also evident that during the same period the cost of living was also increasing at a faster rate than increases in milk prices. The increases in average weekly earnings were also increasing at a faster rate than prices, meaning that secondary and tertiary industry were attractive alternatives to dairying, especially for farmers' children who did not regard dairying as a way of life. For farmers employing hired labour, the increases in their wages were occurring at a faster rate than increases in milk prices received. In real terms, dairy farmers throughout the state were experiencing declining real returns and also sustained declines in disposable family income after 1950.

The Australian dairy industry has been characterised by both government controls and support schemes, including New South Wales Milk Board quotas, tariffs, import restrictions, subsidies, restrictions for margarine production and import restrictions. These schemes closed the domestic market from competition and also supported Australian exports of milk products on the international market by charging domestic consumers a higher price. Therefore, the dairy industry was able to maintain returns to producers even after the free market mechanism would have caused returns to decline.

However, in these support schemes the Australian dairy industry brought about its own demise. Producers were encouraged to maintain milk production and inefficient producers remained in the industry, causing an oversupply of milk. This milk was consequently sold on the international market at a lower price, the producer being subsidised by the Australian consumer. The industry became increasingly inefficient and less price-competitive so that after the post-war boom it experienced sustained decline.

This oversupply was also caused by a slow growth in demand for Australian dairy products, and particularly for butter, the traditional mainstay of the industry. The Australian population did not expand as rapidly as planned and migrants from southern Europe were not consumers of dairy products. On the international market the entry of Britain into the European Economic Community caused a depression in exports and a move towards the smaller markets of the Middle East and Asia. The main hope for the future lies in the new generation dairy products and in milk products requiring further processing on the export market.

The other reasons for the decline in the industry were also indirectly connected with the overriding fall in real returns. These include the ill-health, death or advancing age of producers which has precipitated the closure of the dairy enterprise. However, these are the result of farmers' children leaving for employment in secondary and tertiary industry, which offer higher returns relative to hours and effort involved. The introduction of bulk milk collection and the tightening of dairy industry hygiene standards also caused some producers to leave the industry. With falling returns from dairying, farmers believed that they would never recoup the initial capital outlay required in the conversion to bulk collection or in the improvement of milking sheds and equipment.

The availability of a reliable source of water has been important in the withdrawal of farmers from the industry, particularly when their holdings were located on hill country or on intermittent streams. Exceptions to this generalisation exist at Hilldale and Lewins Brook, where irrigation water is stored in large farm dams. The construction of Lostock Dam on the Upper Paterson River has meant that farmers below the dam have a reliable water supply even in periods of prolonged drought. However, this does not seem to have stopped farm withdrawals in the Paterson River, which have continued at a rate faster than those on the Allyn River.

The decline in the dairy industry of the Paterson Valley has not left the land unused, but it is now occupied by alternative forms of land-use. Beef grazing has increased in popularity due to the fact that dairy farmers are familiar with its operation and, secondly, it is less demanding in terms of time and effort. The broiler chicken industry has expanded because it is relatively cost efficient due to the implementation of numerous technological improvements. Finally, hobby farmers are important in that they have provided a means by which dairy farmers can sell a part or the whole of their property at high market prices, and have therefore encouraged producers to leave the industry.

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