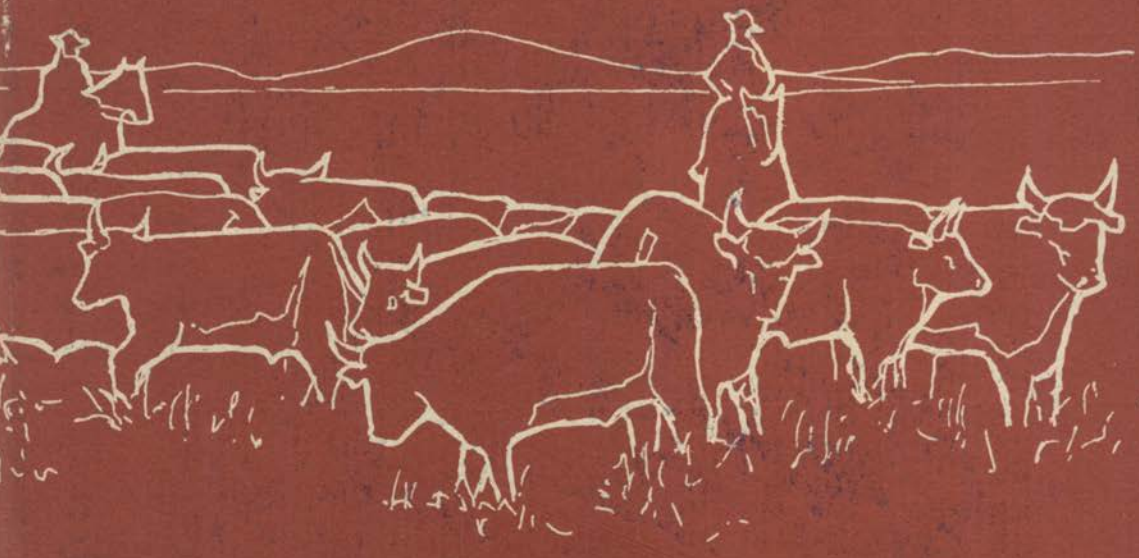
BEEF

IN

NORTHERN AUSTRALIA

J.H. KELLY



In the harsh environment of Northern Australia cattle raising is the only industry that has survived in the hinterland for any length of time. It has faced many challenges—hostile terrain, drought, distance from markets, lack of manpower—and the vast areas catch the public imagination, attracting investors and pastoralists.

What then are the prospects for the beef industry in the North? Given efficient managements—and many are not—and given constructive government policies—again, many are not—the prospects are good. The author proposes practical measures for improving quality and quantity of beef cattle as a model for future development.

This book, while unsparing in its criticism of the inept and the inefficient, is a constructive study of an area vital in terms of economics, politics, and the pastoral industry.

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J. H. KELLY

WITH AN INTRODUCTION BY
SIR JOHN CRAWFORD

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To Jim, Don, and John

FOREWORD

IN this exhaustive survey of the beef industry in the northern regions of Australia, John Kelly draws on some twenty-odd years of personal, continuous contact with the men running the many station organisations scattered throughout the area. A colourful figure with a stamina given to few men, he travelled the northern cattle areas for many years and was an adviser to government politicians and officials on northern problems. In this study he combines his intimate knowledge of the open-range and closed-range grazing systems in the north, of scientific research results, and of State and Commonwealth Government policies to produce an interesting blend of factual description, personal deductions, and policy prescriptions aimed at the development of a 'technically feasible, economically attainable beef potential in northern Australia'.

Kelly's book has its origins in the economic survey of the beef cattle industry in northern Australia commenced within the Commonwealth Bureau of Agricultural Economics in 1948. As Director of the Bureau at the time I was responsible for allocating this task to Kelly and now, many years on and long removed from any responsibilities in the Bureau, I am extremely pleased to have been asked to write the foreword to the further fruits of that initial survey.

Kelly's estimates of the economically feasible productive capacity of the northern beef cattle industry are based on effective land occupancy, and on the efficient utilisation of pastoral resources, involving competent all-round management. Government policy (both Commonwealth

and State) is critically important in devising methods of achieving these. He is, in fact, highly critical of several aspects of past and present land policy in the north, including the lack of effective control over the rate of improvement of large-scale holdings held, in many cases, by overseas interests. He considers the Queensland government to have shown greater regard for the public interest in its land policies than either the Commonwealth Government in respect of the Northern Territory or the Western Australian government in respect of the Kimberleys.

His account of government policies and pastoral company activities is bound to provoke argument. This is all to the good in an area in which difficult decisions, not always wholly economic in character, have to be made. His historical survey of northern development, his strictures on past events and present trends, and his constructive suggestions for the future are certain to be of great interest to the decision-maker as well as to the historian. They also need to be given careful attention by governments concerned with the development of this country. The beef cattle industry is one primary industry in Australia in which it is still practicable to talk in terms of expansion of production and markets. Any possible ways in which its efficiency can be increased must be thoroughly explored.

Canberra, January 1971 J. G. Crawford

ACKNOWLEDGMENTS

THIS study of the beef cattle industry in northern Australia was made possible by a monetary grant awarded by the Reserve Bank of Australia to the Australian National University. I appreciate the Bank's generosity in this regard.

In its administration of the grant, the A.N.U. extended to me the hospitality of the Research School of Social Sciences during the period 1967-70, enabling me to work in the Department of Economic History, with adequate secretarial and computer facilities and the provision of a motor vehicle for extensive field studies in 1967. I acknowledge the help of the head of the department, Professor N. G. Butlin and of Dr Alan Barnard, in comment on and criticism of particular aspects of my work; of members of the archives section; and of Mrs A. Guenot and Mrs D. J. Mitchell in typing the manuscript. I am grateful for aids rendered by Mrs Mary Rose in computer programming; Miss N. Suthern in checking numerous tables and calculations; Mr K. Mitchell of the Department of Human Geography, A.N.U. for drawing the maps and the staff of A.N.U. Press in the editing of the manuscript. I acknowledge especially, the encouragement of the Vice-Chancellor, Sir John Crawford.

During my field survey I obtained a wealth of detailed information from farmers and graziers covering a wide range of beef enterprises in all regions of the north. Everywhere I was accorded generous hospitality and co-operation.

ACKNOWLEDGMENTS

Important information was furnished by cattlemen on the understanding that names of persons or properties would not be revealed unless specifically authorised. In these circumstances I express my gratitude to all cattlemen concerned.

In an endeavour to present a balanced picture of present and future beef industry development I sought the co-operation of particular pastoral companies as well as selected individual cattlemen. I acknowledge the hospitality and help of Stanbroke, King Ranch, Hooker, Lakeland Downs and Springvale pastoral companies, and the major contribution each is making to beef industry development.

Mr Basil Quilty, holder of Bedford Downs Station in Kimberley Region, and Mr Kevin Shaw, manager of Fort Constantine Station in Qld Gulf Region made available their private aircraft and personally piloted me in aerial reconnaissance in these regions. These aids were a valuable contribution to the success of my field work.

I gratefully acknowledge the following:

Assistance rendered by branch managers of pastoral finance and livestock handling agencies throughout the north, and by Mr G. A. Manning, former assistant general manager, and Mr R. McGuiness, livestock executive of Elders Goldsbrough, Ltd.

The help of CSIRO, Queensland Departments of Primary Industries and Lands, Western Australian Department of Agriculture, the Animal Industry and Agriculture Branch of the Northern Territory Administration, the Pastoral Board of South Australia, and the N.S.W. Water Conservation and Irrigation Commission.

Technical assistance accorded by the Land Research and Tropical Pasture Divisions of CSIRO, enabling me to make a well-informed appreciation of beef potentialities arising from pasture improvement in the remote Kimberley, Arnhem, N.T. Gulf, and Peninsular regions, and of the wallum and eastern speargrass country of eastern Queensland. In particular, I acknowledge the help of Mr Alan Stewart, Chief of the Division of Land Research; the late Dr J. Griffith Davies, former Chief of the Division of Tropical Pastures; M. J. T. Norman, R. A. Perry, P. Madge, and L. J. Phillips, of the Division of Land Research; J. E. Coaldrake, N. H. Shaw, W. Bryan, L. Edye, P. Gilliard, D. Cameron, and J. Ritson, of the Division of Tropical Pastures.

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The aid of the Northern Division, Commonwealth Department of National Development, in providing maps and information relative to beef roads construction programs in northern Australia.

The provision made by Dr J. M. Harvey, Permanent Head of the Queensland Department of Primary Industries, for aid to be rendered by members of Head Office staff; at Coolum and South Johnstone experiment farms and research stations; and by Rockhampton, Townsville, Mareeba, and Atherton regional officers. I mention, especially, Mr T. E. Graham who personally conducted me over a wide area of the Fitzroy basin and highlands of central Queensland.

The aid of the Queensland fertiliser firm, A.C.F. Shirleys Ltd in providing information through the general manager, Mr J. V. Wilkins, Dr John Pulsford, technical adviser, and Mr John Leahy, regional representative for central Queensland in arranging for field inspections in various regions.

The valuable material provided by Mr Eric Richardson, former principal of the experiment farm at Katherine, regarding the economic feasibility of greatly increased beef production from properly established regularly fertilised Townsville stylo in northern areas of adequate rainfall.

The aid of Mr Gordon McDowell, Queensland Chief Commissioner of Lands, who readily furnished solicited information and arranged for Mr J. Donahue, Lands Department regional officer at Moura, to conduct me in an extensive brigalow area itinerary including visits to numerous farms in the areas now being developed under the Commonwealth-aided brigalow development scheme.

The Royal Flying Doctor Service in enabling me to maintain regular contact with regional operators through my mobile outpost radio transceiver in remote locations.

Also, I am grateful for the generous space accorded me by the metropolitan and country press, particularly in the north, in publicising relevant aspects of my work, and for the facilities accorded me through television current affairs and regional broadcasting programs of the Australian Broadcasting Commission.

J.H.K.

Canberra 1970

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ABBREVIATIONS

A.M.B.	Australian Meat Board
B.A.E.	Bureau of Agricultural Economics
B.M.R.	Bureau of Mineral Resources
C.L.R.	*Commonwealth Law Reports*
C.P.D.	*Commonwealth Parliamentary Debates*
C.P.P.	*Commonwealth Parliamentary Papers*
CSIRO	Commonwealth Scientific and Industrial Research Organization
N.A.D.C.	North Australia Development Committee
N.T.P.L.A.	Northern Territory Pastoral Lessees Association

INTRODUCTION

THE principal aim of this work is to outline practicable measures for the development of a technically feasible, economically attainable beef potential in northern Australia, in the light of a twenty-two year study of northern beef production resources. It is oriented to four particular provinces of influence: first, that of cattlemen of the present and future, upon whose management capabilities and technical skills achievement of the potential primarily depends; second, that of scientific researchers in fields of hydrology, agronomy, agricultural economy, and animal husbandry; third, that of governmental instrumentalities concerned with land utilisation and administration, water conservation and irrigation, and transport; fourth, that of those concerned in the financing of cattle station and herd improvement.

The study has, as its main emphasis, the identification and discussion of problems of development, and the formulation of development programs and of the priorities involved. It also attempts to show how we can learn from the mistakes of past policies and events.

A joint meeting in 1947 of the North Australia Development Committee (N.A.D.C.) and the Australian Meat Board (A.M.B.) recommended that the Commonwealth Bureau of Agricultural Economics (B.A.E.) should undertake an economic survey of the beef cattle industry in northern Australia. This task was assigned to me.

The field study began in the Northern Territory in April 1948 and extended region by region and year by year to 1970. The main emphasis

was on the structural improvement of cattle stations, pasture and herd improvement, station management, and the provision of adequate facilities for the movement of cattle from breeding to fattening areas and to slaughtering points.

The station by station survey involved detailed discussions with resident station holders, and managers for absentee holders; inspection of properties, with particular regard to structural improvements; working (as an ordinary stockman) with mustering camps in order to obtain an appreciation of types and quality of cattle and methods of handling them; the labour structure, with particular regard to the role of Aborigines in the workforce; and appreciation of problems of station management. The study revealed that the major problems of beef industry development were located in the 'remote' regions, broadly defined as that part of Queensland to the west of the 144th meridian, the whole of the Northern Territory, and Kimberley districts of Western Australia to the north of lat. 20°S.

Over most of its history the beef industry of the remote regions of northern Australia was operated on a near primitive open range system of grazing on cattle stations, which varied in size from a few hundred to about 10,000 square miles, carrying herds of from less than 1,000 to more than 100,000 cattle.

Market outlets for remote region cattle were restricted and cattle prices were low until the early 1950s. Consequently, structural improvements on many holdings were inadequate for establishing effective control of cattle and reasonable animal husbandry. Cattle were largely of nondescript quality. Without control, cattle numbers increased during runs of good seasons beyond limits of safety, with inevitable over-concentration around remaining natural surface waters in adverse seasons, leading to over-grazing and consequent denudation of native pasture and serious soil erosion. In many parts the cattle-carrying capacity of the native pastures and edible bush was substantially lower in the 1960s than when cattle raising was established in remote Queensland regions in the 1850s, in the Northern Territory in the 1870s, and in the Kimberleys in the 1880s.

The government of Western Australia built a meatworks at Wyndham where slaughtering and refrigeration began in 1919. Except for a brief

cessation in the beef slump year of 1921 and in 1942-4, operation of the Wyndham meatworks was continuous, under government ownership, to 1966, when the works were sold to a private enterprise. Cattle were drawn from the East Kimberley and western areas of the Territory. The Wyndham meatworks operated at a loss under government ownership, but it is yet too early to attempt to assess its economic prospects under private ownership. The meatworks at Darwin operated for only four years from 1917.

Cattlemen of the Queensland Gulf and south-west Channel country were relatively better placed for selling their cattle than those of the Kimberleys and Northern Territory, having access to more profitable export outlets and domestic markets, except for a small number of cattlemen in Cape York Peninsula, to the north of the Mitchell River, who operated under conditions even more primitive than those of their counterparts in the Kimberleys and the Territory to the north of lat. 15°S.

From 1930 onwards, the cattlemen of the Alice Springs district in central Australia were, in respect of transport facilities and access to market, the most favourably placed of those in the remote regions. The Oodnadatta-Alice Springs section of the proposed north-south trans-continental railway gave central Australian cattlemen access to the Adelaide market where prices were at least as good as in other Australian metropolitan markets.

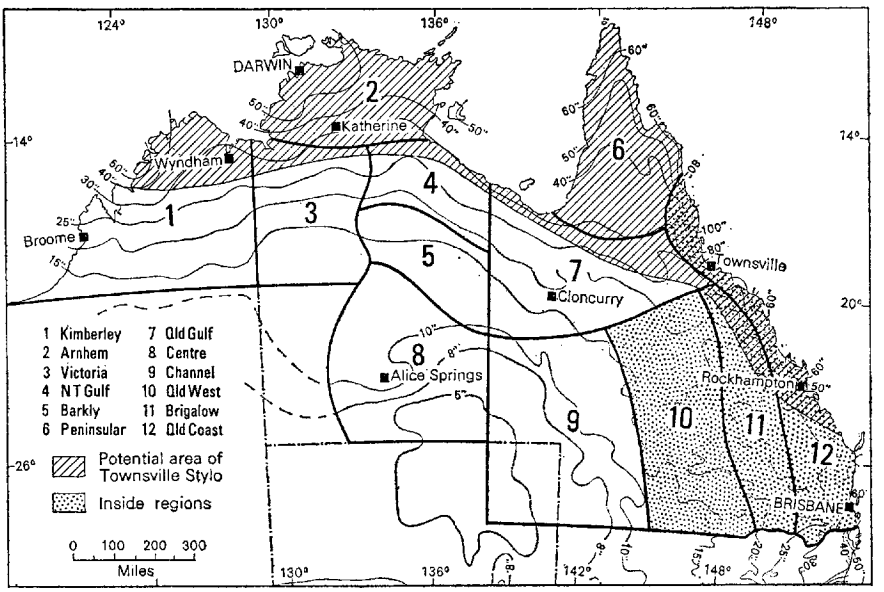
Though the inefficiency of open range cattle raising in the remote regions of the north was widely acknowledged, there were sufficient examples of reasonably improved holdings of moderate size, occupied by resident lessees, carrying cattle herds of fair quality, to indicate a worthwhile native pasture cattle potential in most of the remote regions.

Notwithstanding the light cattle-carrying nature of the relatively low rainfall areas of the Alice Springs district, the level of structural improvement of cattle holdings, though still inadequate, and the general quality of the cattle carried were the highest of the Territory and Kimberley cattle areas in 1948. Cattle stations in the Alice Springs district were, in herd size terms, of small to moderate size, (2,000 to 7,000 head) mostly held by resident holders.

At that time the level of structural improvement, the quality of cattle,

and the percentage of herd turn-off on resident holder areas in the Qld Gulf and Channel country were substantially higher than on larger areas held there by absentee pastoral interests.

In the Kimberleys, cattle raising was wholly on the open range system. Holdings were mostly large with few structural improvements; the mileage of fencing was small and 'made' waters (bores, dams, etc.) were



MAP 2 *Northern Australian cattle regions*

few. Although the area of occupied cattle country in the Kimberleys was substantially less than in the Territory, cattle numbers were higher up to 1915. Kimberley cattle numbers reached a peak of 668,000 in 1917, compared with only 542,000 for the whole of the Northern Territory in that year.[1] Kimberley cattle numbers had declined to 430,000 in 1948, by which time Territory numbers had risen to 990,000.[2] Cattle numbers in Queensland remote regions (Qld Gulf-Peninsular-Channel) totalled

[1] G. C. Bolton, Survey of the Kimberley Pastoral Industry from 1885 to the Present, Appendix VI. M.A. thesis, University of Western Australia, 1953.

[2] J. H. Kelly, *Report on the Beef Cattle Industry in Northern Australia*, Appendix F, B.A.E., Canberra, 1952.

approximately 1,400,000 in 1948 (see map 2) the total of the remote regions then being 2,820,000.[3]

This was, broadly, the picture of the cattle industry of the remote regions of the north in 1946-8 when the N.A.D.C. was engaged in an investigation of the beef cattle industry in those regions. Most of the N.A.D.C. recommendations were adopted by the three governments concerned — Commonwealth, Queensland, and Western Australia. This marked the beginning of an era of vigorous research and investigation by the CSIRO, the Bureau of Mineral Resources (B.M.R.), the B.A.E., the Northern Territory Administration, and appropriate departments of the governments of Queensland and Western Australia. Field research stations were established in the Kimberleys at Kununurra and in the Territory at Katherine in 1946 and, recently, at Townsville and Narayan in Queensland (map 1). Regional surveys carried out by CSIRO Division of Land Research have covered most of the beef cattle regions of the north, in the process of which land systems have been defined and delineated, and soil types and vegetative species have been identified.

From 1946 to 1970, the range of scientific and economic research, the volume of public discussion and reporting thereon, and the amount of public monies expended in beef industry investigation far surpassed anything of the kind over the entire previous history of the northern beef industry. In these fields, the role of the Commonwealth became increasingly important: inevitably, since the establishment of uniform taxation in 1942 restricted the fund raising capabilities of the States, rendering them more dependent on the Commonwealth for loans and grants for the financing of large-scale developmental projects.

In recent times, public attention has been focused on irrigated and non-irrigated land industry development in expectation of a breakthrough to economic improved pasture and agricultural development, through sowings of Townsville stylo (*Stylosanthes sundaica*, formerly Townsville lucerne) in Kimberley, Arnhem-N.T. Gulf, and Peninsular regions above the 30-inch rainfall isohyet, and large-scale grain sorghum sowing on the 3,560 square miles Tipperary Station now under American

[3] My analysis of Bureau of Census and Statistics *Qld Statistical Bulletins*.

ownership. This has attracted substantial American investment in the purchase of numerous cattle stations in these regions.

In many respects the Northern Territory has become the dryland research centre of the remote northern regions. In scientific land industry research the scale and purposes of CSIRO activities at Katherine Research Station, and in other field activities throughout the Territory, are of major dimensions by world standards.

In the Kimberley region, scientific research in fields of hydrology and agronomy has been on a large scale. The Kimberley Research Station at Kununurra, operated jointly by the CSIRO and the Western Australian Department of Agriculture, has covered wide fields of activity in plant industry and animal nutrition. Reclamation work of the Western Australian Department of Agriculture has been directed at checking erosion and reclaiming eroded areas in the upper Ord watershed.[4]

Although it has not been directly related to cattle production, the progress of the Ord River pilot farm irrigation enterprise in East Kimberley, and the Camballin irrigation project on the Fitzroy River in West Kimberley has been observed with interest by many Kimberley cattlemen. Such development, given the right financial and land utilisation patterns, promises economic use of Ord River cottonseed residues as protein supplementation for cattle, and the use of irrigated fodder crops and grain for the fattening of store cattle.

In 'inside' Queensland regions (Brigalow-Qld Coast), research and experiment in fields of plant industry, cattle breeds, and animal nutrition, carried on by the CSIRO Division of Tropical Pastures, Queensland departments of Primary Industries and Lands, and the A.M.B., with active co-operation of numerous individual cattle property holders, has yielded important results which can guide policy. The major activity in inside regions has been in the brigalow (*Acacia harpophylla*) and speargrass areas, in the wallum (tropical heathland) country and in northern wet coastal areas. Queensland areas to the east of the Great Dividing Range have long been recognised as having the highest beef potential in northern Australia.

Economic studies by the B.A.E. have covered many aspects of cattle

[4] K. F. Fitzgerald, *Ord River Regeneration Project*, Department of Agriculture of Western Australia, Bulletin No. 3599, 1968.

production, including land tenure and occupancy, efficient productive size of cattle holdings, structural improvement of holdings, labour structure, cattle handling and animal husbandry, plant nutrition, pasture management, pasture improvement, crop fattening of cattle, pest and disease control, and transport. Here, as in other fields, the scope of investigation has been wider, and analysis more detailed over the 1948-70 period than in the entire previous history of cattle raising in the north.

Large sums of public money have been invested in various administrative and investigational procedures and in the control of pests and diseases. Except for water conservation and irrigation development, public investment has been mainly in the provision of better facilities for the movement of cattle by road, rail, and sea transport and improved stock watering facilities on stock routes. (For example, the Commonwealth commitment under the beef roads programs for 1961-74 is $A107m. — see map 1).

During the twenty years of quickening interest in northern Australia there has been a substantial increase in beef production, but the greater part of it has occurred in inside regions of Queensland.

Apart from heavy public investment in Territory pastoral industry research and in beef road construction, there has also been substantial private investment in structural and pasture improvement of some cattle properties. Besides the improvement in Territory transport facilities, meatworks of modern design have been established at Katherine and Darwin, with combined annual slaughtering capacity of 60,000 head of cattle, and have been operating since 1963, though not yet at full capacity.

Despite this substantial public and private investment, there has been no really significant increase in either cattle numbers or turn-off in the Territory over the 1948-70 period.[5] Up to the present, Territory cattle production has been almost wholly from native pastures. The CSIRO had, in the 1960s, demonstrated the technical feasibility of substantial increase of beef production through the sowing to Townsville stylo, covering approximately 39,000 square miles in the 30-inch or higher rainfall zone. In 1964 the area sown to Townsville stylo in this zone was

[5] 'Turn-off' is a term in common use in northern Australia denoting the annual output of marketable cattle from a cattle station or a region.

58 square miles. In 1969, the area sown had increased to 206 square miles.[6]

In inside regions of Queensland the results of research and experiment in pasture improvement in areas of higher than 25-inch rainfall, and in scrub-clearing techniques in brigalow, wallum, and wet coastal country, give promise of a high beef production potential, but the all-important question of the economic feasibility of achieving this potential has yet to be answered.

In assessing the northern beef potential, two critically important needs arise. The first is to determine the technologically feasible beef potential in terms of the cattle-carrying capacity and productivity that *could* be achieved (without regard to cost) in the light of current knowledge, the second is to determine the extent to which the technically attainable potential is economically feasible *now*, based on current relationships between cattle prices, costs of structural improvements, and operating costs.

Experience in the cattle industry illustrates something that economists have come to understand only recently about developing areas. Capital has a limited absorptive capacity — the supply of skilled management and labour and of suitable breeding cattle is not automatically available to conjoin with injections of new capital. On the contrary, their relative scarcity causes a crucial bottleneck in further development. (American investors in northern Australian cattle stations now recognise these limitations.)

A clear distinction should be drawn between what is technically and what is economically feasible. This is fundamental to a sound appreciation of the beef economy of northern Australia. Such an appraisal is not difficult in respect of those areas of the remote regions where (in the light of present knowledge) production will continue to be based on a native pasture economy. But a major difficulty lies in making a sound economic appreciation of beef potential, based on higher cattle densities which result from pasture improvement, in regions (both remote and inside) of higher than, say, 23-inch average annual rainfall and from supplementary feeding.

[6] L. E. Woods, 'Northern Territory Primary Producers' Convention', sponsored by Top End Primary Producers Pty Ltd and the N.T. Administration, Table 1, Darwin, Apr. 1969.

At the turn of the century, beef cattle numbers in northern Australia totalled 4·2m. The nineteenth-century peak of 7m. was reached in 1894. At the end of the 1899-1903 drought, numbers had fallen to 2·5m. and did not recover to 7m. until 1920.[7]

Over the period 1963-9 there was no significant change in cattle numbers in those regions, as table 1 shows.

Table 1

Changes in remote region beef cattle numbers, 1963-9

	1963 '000 head	1964 '000 head	1965 '000 head	1966 '000 head	1967 '000 head	1968 '000 head	1969 '000 head
Queensland Statistical Division							
Peninsular	101	99	100	105	106	107	95
Cairns	184	175	192	195	202	222	223
North-Western	1,128	1,122	1,166	1,177	1,103	1,146	1,217
Far Western	294	310	282	188	208	210	252
South-Western	247	279	293	198	181	235	274
	1,954	1,985	2,032	1,863	1,799	1,919	2,061
Northern Territory Administration Districts							
Darwin Gulf	207	206	212	207	210	201	179
Victoria River	349	334	303	311	305	331	347
Barkly Tableland	372	383	386	398	437	425	440
Alice Springs	158	182	136	134	154	173	219
	1,086	1,105	1,049	1,051	1,106	1,130	1,185
Western Australia Statistical Division							
Kimberley	588	588	549	524	533	548	596
Total	3,628	3,678	3,648	3,418	3,429	3,597	3,841

Note: All figures rounded.
Source: Bureau of Census and Statistics, *Statistical Summaries*, 1963-9.

With rare exceptions, beef cattle raising in northern Australia was not a profitable enterprise over the first half of this century. Beef prices in the domestic market were almost uniformly low, production being

[7] Annual Report of the Australian Meat Board, 1965 table 38 (b): Commonwealth Statistician.

mostly surplus to Australian demand. From the 1890s onwards northern cattlemen became increasingly dependent upon export outlets for their marketable cattle.

The purpose of my 1967 field work was to study a sample of twenty-one cattle stations, selected as representative of stations in remote regions (map 2), totalling 23,683 square miles, with native pasture carrying capacity estimated (by the sample holders) at 180,000 head when adequately improved. The size of sample stations varied from 245 square miles in Qld Gulf, to 2,339 square miles in Centre region. Herd sizes varied from 1,200 in Centre to 12,000 in Kimberley region. Supplementary information was obtained in respect of twenty-six non-sample holdings covering 39,388 square miles of a (holder estimated) native pasture carrying capacity of 390,000 head when adequately improved. These holdings varied in size from 138 square miles in Peninsular to 4,772 square miles in Victoria region. Potential herd sizes varied from 3,000 to 60,000 head.

I had visited all of the cattle stations in the remote regions several times between 1948 and 1967. In the light of knowledge gained from these visits, it was more practicable to select rather than to draw at random a limited sample of holdings in all the remote regions for study to enable the presentation of the 1967 picture of the needs of beef industry development in these regions. This involved study in depth of the sample holdings and reconnaissance in detail form in respect of the supplementary holdings. Information was gained on holdings totalling 63,071 square miles with cattle capacity of 570,000 head, representing approximately 12 per cent of my estimated remote region cattle potential of 4·9m. This book is the outcome of these studies.

1

QUEENSLAND, THE BEEF STATE

QUEENSLAND'S emergence as the premier beef export State of Australia was evident in the 1890s. The first significant export of Australian frozen beef was in 1890 — 1,500 tons. By 1900 it had risen to 43,000 tons, the bulk of which came from Queensland. The first official statistical recording of actual Queensland beef export was 30,600 tons, out of an Australian total of 31,800 tons in 1909. From 1910 to 1950, Australian beef exports totalled 3·2m. tons, of which Queensland contributed 2·6m., or 81 per cent.[1]

BRIGALOW — QLD COAST REGIONS

From the beginning of cattle raising in Queensland, the inside Brigalow-Qld Coast regions carried the largest proportion of the State's beef cattle. The cattle-carrying capacity is substantially higher, and the possibilities of increased capacity through pasture improvement and fodder cropping are greater than that of the remote regions of Queensland, the Territory, and the Kimberleys.

Up to 1950, little attempt was made to develop the high beef potential of the basins of the Burdekin, Fitzroy, Burnett, and Mary rivers. For example, although the high fertility of the brigalow country, extending

[1] Commonwealth of Australia, *Thirtieth Annual Report of the Australian Meat Board*, Table 38(a) and (b), Sydney, 30 June 1965.

from Goondiwindi in the south to Collinsville in the north, had long been recognised, an economic method of eliminating the dense brigalow scrub had not then been found.

The low prices for cattle up to the outbreak of World War II did not encourage cattlemen to invest in structural improvements essential to increased production. Nor was sufficient credit available, even had there been the desire to construct improvements. Another seriously limiting factor of development of the fertile brigalow country was the fact that up to the early 1930s, when prickly pear was eliminated by the cactoblastis insect, most of the brigalow scrub was prickly pear infested, rendering this country of little use for cattle raising.

Although the cattle country of the Brigalow-Qld Coast region (map 2) was more closely settled, and the proportion of resident holders of properties of small to moderate size was higher than in the remote Queensland cattle regions, much of the country, particularly in the basins of the Fitzroy and Burdekin rivers, was still held in large leaseholds, some by non-resident holders. However, the improvement requirements set down by the Queensland lands administration authorities were more demanding in the inside than in the remote regions, and the levels of structural improvement of cattle holdings were consequently higher than in the Channel, Gulf, and Peninsular regions.

The problem of the movement of cattle was less critical in the eastern than in the northern and western regions. Until 1960 the movement of cattle was by stock route and rail. Beef cattle areas of high density, to the south of the Rockhampton-Longreach railway, were reasonably well served by a railway network, most of the cattle properties being within 100 miles of rail loading points. Areas to the north were also reasonably well served, most properties being within 100 miles radius of rail loading points on the Rockhampton-Townsville-Cairns railway (map 1).

Ever since the invasion of the cattle tick in the 1890s, this pest has constituted the greatest single menace to the cattle industry. Most of Peninsular-Queensland Gulf-Brigalow-Qld Coast regions are subject to tick infestation in varying degrees of intensity. Regular dipping of cattle has long been practised as the most effective measure of control, but the pest is still regarded as the greatest single cause of loss.[2]

[2] *The Economic Importance of Cattle Tick in Australia*, B.A.E., Canberra, 1959.

Although much had been done, up to the 1960s, in pasture and animal nutrition research by the Queensland Department of Primary Industries and the CSIRO, often in active collaboration with cattlemen, relatively little had been attempted in large-scale pasture improvement by individual cattlemen, other than in the sowing of Rhodes grass in suitable areas. Only isolated attempts at commercial crop fattening of beef cattle were made. In the 1940s the standard of animal husbandry was fair and the quality of the cattle good, but there was still much room for improvement in both fields.

By 1910 Queensland's beef cattle numbers had recovered from 2 million in 1903 to 4·6 million. At the end of each subsequent decade numbers fluctuated as follows: 1920 — 5·9 million; 1930 — 4·5 million; 1940 — 4·7 million; 1950 — 4·9 million. More than half of Queensland's cattle were carried in the Brigalow-Qld Coast regions.

QLD GULF REGION

Qld Gulf was next in importance to Brigalow and Qld Coast regions, in terms of cattle numbers carried and beef produced. Qld Gulf region embraces northern and north-western areas drained to the Gulf of Carpentaria by the Gregory, Leichhardt, Flinders, Norman, and Gilbert river systems, and the southern part of the Mitchell River to the west of approximately the 143rd meridian. A limiting factor of beef production, on native pasture alone, is the unfavourable annual rainfall (20-35 inches average), the dry season being normally of eight months duration (mid-March to mid-November.)

Qld Gulf, in common with Peninsular and Channel regions of south-western Queensland, is a remote region of northern Australia. Excepting the southern part, which is largely used for wool growing, the Qld Gulf region is used for beef cattle raising. Approximately one-fifth of the State's beef cattle were carried on 100,000 square miles of Gulf cattle country. From the 1930s, more than half of the cattle in the region were carried on very large absentee held stations in herds of up to 40,000 head.

In the early 1920s the Queensland government embarked on a program of State-owned meat retailing establishments. They were supported by a chain of cattle stations purchased by the State, some

being used for breeding and others for fattening cattle. Notable amongst these was a group of stations in Qld Gulf region. This, however, was a short-lived venture. Following a change of government in 1929, the State-controlled meat retailing system was abandoned, and the cattle stations that had been purchased by the State were sold to private pastoral interests.

In contrast with Brigalow-Qld Coast regions, the movement of cattle from outlying parts of Qld Gulf constituted a problem before the construction of beef roads, which facilitated the movement of cattle after 1963. Cattle holdings within 100 miles of the Townsville-Mount Isa railway system had reasonable access to export meatworks at Townsville and Bowen. Beyond the hundred-mile radius, however, carcass quality progressively diminished according to the distance cattle had to be walked to railhead or meatworks. At this time there was no road transport of cattle because cattle prices were insufficient to bear the higher cost of movement by motor transport compared with droving and the roads were quite unsuitable for the purpose.

Cattle raising in Qld Gulf region was operated largely on the open range system. The standard of open range management was not inefficient, considering that fencing and made stock watering facilities were wholly inadequate. An example of this is the experience of a well-known former pastoral superintendent who, as well as actively managing one station carrying 24,000 head of cattle, superintended the management of fifteen stations in the region carrying 250,000 head of cattle.

This superintendent was competent in every aspect of cattle station operation, from the tasks of a stockman and a drover to the top superintendency of such a vast aggregation. His experience included twenty-seven years of management of the head station, from which he supervised the whole operation.

The managers of the stations under this superintendent's control were mostly young, experienced cattlemen. They were working managers in the sense that they spent as much of their time as possible in direct contact with their stock camp. Each had a competent head stockman to lead his camp, with authority to make on-the-spot decisions in matters related to the handling of cattle.

The cattle tick was a serious menace in most of the region. Although

cattle dips were not numerous, a reasonable measure of control was maintained by a combination of discriminatory burning of coarse grass (with consequent destruction of host ticks) and dipping at strategic times.

Under this scheme of open range management, the task of maintaining cattle numbers at levels aggregating approximately 250,000 (under a ceiling of about 300,000) with reasonably effective control was performed efficiently, considering the limitations imposed by the wide dispersal of stations in the group, and by inadequate fencing and stock watering facilities.[3]

The whole enterprise was operated on a low investment basis. Investments in structural improvements — fences, stockyards, and dips, made stock water supplies, buildings — were minimal. The principal assets were in leaseholds and cattle. Although cattle prices were low, production costs including wages were also low, so that the profit on the actual investment was high. Following the relinquishment of control by this superintendent in 1944, the efficiency of the open range management of the stations within the aggregation progressively declined. By 1950, cattle numbers had fallen substantially below 250,000. Brandings declined, as did the percentage of total cattle numbers turned off. The rate of return to the holding interests, though probably still more than adequate, fell commensurately with the decline in cattle turn-off.

This experience served to underscore, as subsequent events proved to be correct, that the availability of capable open range station managers and pastoral superintendents was declining. There were individual non-resident holders and other holders of aggregations of cattle stations in the Gulf country who had similar experience. More than half of the cattle-carrying capacity (both existing and potential) was held in large leaseholds and aggregations by non-resident holders.

The experience of the Qld Gulf and other remote regions made the Queensland government realise that the inefficient open range system of cattle raising was depleting the native pasturage and lowering carrying capacity; that it must give way to efficient, protective utilisation of the native pasture resources through more intensive structural improvement, better herd management, and good animal husbandry.

[3] Certified record of an interview with Duncan Campbell at Iluka Station, Burketown, Qld, 25 May 1967.

PENINSULAR REGION

Nearly a century of experience of native pasture cattle grazing in Peninsular region, particularly in areas to the north of the Mitchell River, showed that, except for a limited area of volcanic formation, rain forest areas, and Mitchell River and other stream frontages of limited extent, more than half of Peninsular region ranked amongst the poorest of northern native pasture cattle lands. Although the annual average rainfall varies between 30 inches and more than 50 inches, the eight-month dry season constitutes a positive hazard. Despite an abundance of natural water during, and for some time after the wet, lack of stock water supplies towards the end of the dry is frequently a cause of heavy breeder and calf loss.

Up to the 1960s, access to cattle markets was the most difficult in northern Australia. The walking distance from northernmost parts to the nearest market at Mareeba is 450 miles, the journey taking upwards of twelve weeks. Much of the stock route traversed poorly grassed, hard, and stony country.

Tick infestation was probably the highest of any cattle region in the north, the high rainfall and humidity providing the most favourable cattle tick environment. With odd exceptions, where cattle were dipped infrequently, there was complete absence of measures for tick control.

CHANNEL REGION

The Queensland Channel region embraces far-western and south-western areas of the State which are drained by three major and one minor inland river system, the major (Georgina-Diamantina-Cooper) flowing to Lake Eyre, in seasons of high flood, and the minor (Bulloo) dissipating in north-western New South Wales. The region also includes the north-eastern corner of South Australia.

The Channel country is the most widely known of Australia's remote regions. Because of the uniqueness of its three major river systems, it is of particular interest to geographers. It is especially well known because of the historic Birdsville Track (a desolate and hazardous 400-mile stock route from Birdsville to Marree in South Australia), where so many animals and humans perished on its long waterless stretches.

The Channel country is a 'feast or famine' area. Its average annual

rainfall varies between 5 inches in the south and 10 inches in the north. The seasonal conditions fluctuate between runs of well above and well below the annual average rainfall. In periods of above average rainfall on the catchment of the three major river systems, the floodout covers up to 15,000 square miles of a total regional area (including the north-east corner of South Australia) of about 147,000 square miles.

The abundance of succulent herbage and nutritious grass, which invariably follows the receding of the floods, is of a fattening quality probably unparalleled by native pastures anywhere in Australia. The grasses on the non-flooded country, in periods of normal and higher than average rainfall, are also highly nutritious. When an ideal combination of flood and rainfall occurs it would be difficult to estimate the number of cattle that could be fattened to prime quality and heavy weight.

A century of grazing experience has shown that the safe carrying capacity of the Channel country is determined more by adverse than by good seasonal conditions. Native pasture can change from good to bad within a year. Experience of crippling drought loss has taught Channel country cattlemen the lesson of caution in stocking. Consequently, the overall cattle-carrying capacity of the Channel country has averaged about 4 head to the square mile.

About half of the cattle fattened in the Channel country are bred there, the other half being store cattle for fattening, drawn mainly from the Barkly region and from western areas of the Queensland Gulf region. Several of the big Channel country holdings are held in common interest with breeding properties in the Victoria, Barkly, and Qld Gulf regions.

Apart from the vagaries of seasonal conditions, a limiting factor of optimum utilisation of Channel country fattening resources, before beef roads were constructed, was the lack of facilities for the rapid movement of cattle into and out of the region (some properties were more than 300 miles from railhead).

A season of combined good rainfall and flood introduced an element of uncertainty and risk in the sense that this would influence graziers to purchase store cattle from areas as far distant as 800 miles, involving an overlanding distance of up to sixteen weeks (April-August). At the

end of such a long trek cattle would naturally be muscle-bound and travel-strained to the extent that many could not fatten within a year, and would be dependent upon another favourable season for finishing. If severe drought conditions set in and stock routes were closed, heavy losses were inevitable where cattle numbers were substantially higher than safe (adverse season) carrying capacity.

In the overall Australian 1950 picture, Queensland carried half of the beef cattle. It produced slightly more than a third of total beef production; but its exports represented more than four-fifths of the total. In beef export income terms Queensland was pre-eminent.[4]

Beef production in Queensland throughout this century, and its potential, indicate that Queensland will continue to be the principal producer of beef and that its exportable surplus will continue to represent more than half of the Australian total.

There is abundant technological evidence of a high beef potential in regions with known pasture improvement and crop fattening capabilities. But the degree to which development of the beef potential is economically feasible remains to be established.

In regions where increased production depends on efficient utilisation of the native pastures alone, cattle price is an important factor of economic justification of private investment in land and structural improvement of properties. Further public investment in the provision of adequate facilities for the transport of cattle in remote regions is also a critical factor of development of the beef potential of these regions.

An important problem of development of the beef potential that remains to be solved is the effectiveness of land occupancy. This applies particularly to the remote regions where the greater part of the potential is in large landholdings and aggregations controlled by absentee holders, largely operated on the open range system. Structural changes in the industry therefore involve important aspects of government policy in the administration of the public estate, most of the lands concerned being Crown leaseholds.

[4] *Thirtieth Annual Report of the Australian Meat Board*, 1965.

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THE NORTHERN TERRITORY

IT is nearly one hundred years since the first Northern Territory pastoral leases were granted by the South Australian government. A look at pastoral lands administration under South Australia, from annexation of the Territory in 1863 to the turn of the century, provides a useful backdrop to consideration of the history of the Territory's pastoral development over the first half of this century.

In a penetrating historical study of the Northern Territory pastoral industry (*The Northern Territory Pastoral Industry 1863-1910*), covering the period of South Australian administration up to 1910, Professor Ross Duncan suggested two basic reasons why the Territory presented a depressing contrast to the rest of Australia: 'a harsh environment and lack of available markets'. South Australia's failure to establish a viable pastoral industry in the Territory stemmed largely from too-ready acceptance of McDouall Stuart's ill-founded assertions of 1862, such as: 'I feel confident that if a new settlement is formed in this splendid country, in a few years it will become one of the brightest gems in the British Crown'; that it was 'a region of abundant water and pasture and, north of the Roper, suitable for the growth of any and everything'; that it was 'well adapted to the settlement of a European population, the climate being in every respect suitable and the

surrounding country being of excellent quality and great extent'.[1]

Subsequent experience showed that Stuart's route, to the north of the 20th parallel, traversed mainly inferior country, the best being to the east (Barkly region) and the west (Victoria region). Whilst none could deny McDouall Stuart's skill and courage in his transcontinental explorations, history has shown that his glowing reports of the Territory's pastoral and agricultural potentialities were misleading.

There is little doubt that these reports led to a speculative land boom in the early 1880s and a wild rush to secure pastoral leases. Of the total Territory area of 520,280 square miles, 478,567 square miles were held under application for lease in 1883 (the area held under pastoral lease title in 1969 was 289,400 square miles). Livestock carried in 1883 amounted to 61,000 cattle, 3,000 sheep, and 2,900 horses. There was no agriculture.[2]

Over the next ten years, there were financial gains and losses by speculators during the land booms. Livestock had increased to 240,000 cattle, 63,000 sheep, and 13,700 horses by 1893, but the area held under lease had fallen to 142,000 square miles. In 1895 the leased area was 98,000 square miles, the lowest level between 107,000 square miles in 1880 and 108,000 square miles in 1910, when legislative agreement was reached for the transfer of the Territory to the Commonwealth.[3]

The pastoral industry in the Territory had so deteriorated that in 1895 the South Australian government appointed a Royal Commission on the Northern Territory.

Many *bona fide* graziers lost heavily on their investment up to the 1890s, the heaviest individual loss being of the order of £A200,000. Losses of £A50,000 to £A100,000 were not uncommon. It would be safe to assume that the only ones to have made any gain out of Territory pastoral lands over the period 1870-1900 were speculators. Efforts to establish the pastoral industry in the Territory were mostly failures.[4]

[1] Ross Duncan, *The Northern Territory Pastoral Industry 1863-1910*, p. 4, Melbourne: Melbourne University Press, 1967.

[2] Ibid., Table 1a, p. 158.

[3] Ibid., Table 1b, p. 159; Table 1c, p. 160.

[4] Report of the Royal Commission on the Northern Territory, *S.A.P.P.*, No. 19 of 1895.

In the late 1890s moves were initiated for a railway linking Pine Creek (Northern Territory southern terminal) with Oodnadatta (South Australia northern terminal), to be constructed by private investment under a land grant system. At first, the South Australian government did not appear to be strongly impressed with the proposal, but eventually the Transcontinental Railway Act No. 803 of 1902 was passed. But this legislation proved abortive, for no satisfactory tenders were made to the government.

In order to prevent speculation in land while the land grant railway proposal was under consideration, the South Australian government refused to grant any further pastoral leases after 1901. From 1901 land was obtainable only under annual occupation licence. However, when the railway proposal failed, the South Australian government appeared to lose interest in the development of the Northern Territory and allowed the suspension of the granting of pastoral leases to continue until the Commonwealth, in 1910, finally accepted the Northern Territory, with full responsibility for its administration and development.

THE FIRST YEARS OF COMMONWEALTH ADMINISTRATION

A golden opportunity lay with the Commonwealth to formulate a grand plan for development of the Territory's pastoral resources, thereby providing a model for the States of Queensland and Western Australia in the development of their remote areas. In the light of then existing knowledge, such a plan could have been formulated along the following broad lines:

1. Establish perpetual leasehold as the title of resident pastoral holdings.
2. Define conditions of *bona fide* residence on pastoral holdings.
3. Prohibit the aggregation of pastoral holdings.
4. Accept Crown responsibility for the provision of stock and domestic water supplies.
5. Classify the pastoral lands.
6. Determine the economic size of pastoral holdings, in terms of herd size and carrying capacity, having regard to the most suitable purposes of production, and outlets for livestock turn-off.

7. Prescribe minimum structural improvement conditions of pastoral leaseholds in respect of water supplies, fencing, yards, cattle dips (in tick infested areas), and employees' accommodation, and provide credit facilities to enable such improvements to be effected.
8. Prescribe animal husbandry conditions of perpetual leaseholds in respect of the branding of calves, control of cattle pests and diseases, and control of herd numbers to prevent over-grazing of the vegetation.
9. Establish plant and animal industry research and experiment facilities.
10. Provide adequate facilities for the movement of cattle from stations to market outlets.

The Commonwealth had, under the Northern Territory Acceptance Act of 1910, and the complementary (South Australian) Northern Territory Act of 1910, agreed to extend existing railways north from Oodnadatta and south from Pine Creek, to provide a transcontinental railway linking Darwin with Adelaide, thus providing the Territory with deep-sea outlets in the north and the south. If the land settlement plan had been carried out, the transcontinental railway completed, and an effective network of well watered stock route feeders to railheads provided, the land industries of the Northern Territory would have prospered, and, by the example set for the adjoining States, the pastoral industry development of other remote regions of the north would have been enhanced.

The early history of Commonwealth administration of the Northern Territory indicates that the Commonwealth government in 1911 intended vigorous action for the development of the Northern Territory. But apart from helpful advice from the last Government Resident, there was no well-established administrative machinery for it to take over. With the evident intention of taking early stock of its new possession, the Department of Home and Territories (the department responsible for Northern Territory administration at that time) assembled an impressive array of talent. The Minister appointed Mr W. S. Campbell, an ex-Director of Agriculture in New South Wales, to inspect lands north of the 15th parallel. Professors Gilruth (later Administrator), Woolnough, and Spencer were appointed to visit the Territory and

report on agricultural, veterinary, geological, Aboriginal, and health matters. Three major problems confronted the new Administration: to provide and administer effective land legislation; to provide adequate facilities for the movement of cattle to slaughtering points, to sea ports for shipment alive, and to fattening areas; and to find markets for the cattle turn-off of the pastoral holdings.

The first fifteen years of Commonwealth administration of the Northern Territory yielded little, if anything, really worth while in the development of the Territory's beef resources. The high hopes and optimism engendered by the advent of Commonwealth administration of Northern Territory affairs had been dissipated. In these conditions, the government resolved to establish a North Australia Commission of three and to divide the Territory into two areas for administrative purposes.

The government of that time could reasonably have assumed that the Australian public were receptive to the promise of a better future of the Northern Territory in the idea of its administration by a commission in place of the dual control by the Department of Home Affairs and the Northern Territory Administration. However, the reaction of the big absentee landholders to the idea of a commission to administer the Territory was not favourable.

The Northern Territory (Administration) Act of 1931 brought the existence of the short-lived North Australia Commission to an end, and the Territory reverted to the former system of administration. As to the principal reason for its failure, it is of interest to quote remarks made in Parliament by the Minister for Home Affairs in November 1930, relative to the winding up of the North Australia Commission:[5]

> Frankly I keenly regret that the development schemes which the previous Government had in mind were not brought to fruition: but it was obvious almost from the beginning that any such scheme was doomed to failure. They [the commission] were given a job, but no money with which to do it. Obviously a development commission must have money with which to carry on developmental works, and as that money has not been made available to the North Australia Commission, it follows that the Commission itself is unnecessary, and that the administration by a

[5] *C.P.D.*, Vol. 127, H. of R., pp. 70-3, 5 Nov. 1930.

commission is costly and cumbersome. If funds had been made available and if arrangements had been made with Queensland and Western Australia to carry out a big scheme of development particularly by building railways to open up the very valuable and rich Barkly tableland near the Queensland border and the country right across to the Western Australia border, there would have been some justification for retaining the commission, but its need disappeared when the two States did not proceed any further with the proposition.

LAND LEGISLATION

When it assumed responsibility for the Territory, the Commonwealth government lost no time in tackling the problems associated with the formulation of necessary land legislation. The legislative chaos left by South Australia had to be disentangled and replaced by effective Commonwealth legislation. No new pastoral leases had been granted since 1901, but leases granted previously seemed to have been protected for the holders by South Australian legislation in the transfer to the Commonwealth. The Commonwealth thus faced the problem of preparing new legislation designed to encourage the settlement of the Territory's suitable unoccupied pastoral country. Previously there had been no effective classification of the pastoral lands, nor had there been any detailed survey of stock water resources. These were fundamental to effective settlement of the pastoral lands. To remedy this defect, the Minister for Home Affairs established a classification board consisting of the Chief Surveyor, the Director of Lands, and the Director of Agriculture.

The first Commonwealth Crown Lands Ordinance, No. 3 of 1912, provided for the classification of pastoral lands, and for perpetual leasehold tenure subject to periodical reappraisement. Classification was:

Class	Maximum area sq. m.
1	500
2	1,000
3	3,000

Provision was made under Section 22(d) of this ordinance for 'a covenant by the lessee that he will fence the boundaries of the lease as provided by the regulations'.

Ordinance No. 3 was amended by Ordinance No. 8 of 1912 in two important particulars: first, 'Classification of pastoral lands' was altered to read:

Class	Maximum area sq.m.
1	300
2	600
3	1,500

Secondly, the provision for perpetual leasehold tenure was repealed and leases were fixed at twenty-one years for Class 1 and forty-two years for Classes 2 and 3.

A further important amendment repealed the covenant relating to the fencing of boundaries. Instead, a lessee was bound to spend on permanent improvements the sum stipulated in the advertisement notifying that the land was available for lease.

The provisions contained in Ordinance No. 3 of 1912 were basically sound, although subsequent experience indicated that holding size would be better determined by herd size and carrying capacity than in terms of square miles. If the provisions of perpetual leasehold tenure, limitation of the size of holdings, and the fencing of boundaries had been maintained, the subsequent history of cattle raising in the Territory would not have been such a dismal one as it turned out to be. The amendments to Ordinance No. 3 seemed to indicate confusion and indecision in the early administration of Territory cattle lands.

The basic intention underlying the initial Crown Lands legislation is reflected in the following quotation from a Department of External Affairs Report of March 1913, on operations since the transfer of the Northern Territory to the Commonwealth:

> The object of [the legislation] is not merely to create facile and speedy means to enable applicants to secure Crown lands but chiefly to provide that no lands shall be disposed of except for the purpose of securing actual *bona fide* settlement. It is not the intention to create a set of absentee leaseholders but rather to secure homes for men willing to show their

appreciation of the liberal conditions of their holdings by living on them and developing them to the fullest extent.[6]

OVERSEAS INVESTMENT

It was clearly the original intention of the Commonwealth to develop the pastoral industry of the Territory under closer settlement. But as long as there was no enduring market for cattle, there was little likelihood of administrative action being taken to encourage effective land utilisation by closer settlement. In this situation, and in the light of the Commonwealth's contractual obligation to construct a north-south transcontinental railway, the attention of the government was focused on a northern export outlet. The erection of a meatworks at Darwin was a logical means of satisfying this need. The Fisher ministry favoured a government meatworks enterprise to be operated by the Commonwealth and to this end appointed a specialist to investigate possible suitable sites in the Darwin area. But a federal election took place in 1913 and the Fisher government was defeated.

The Cook ministry which followed reversed the policy of the former government on this point, favouring a privately owned and operated meatworks at Darwin. Significantly, each government recognised the fundamental need for a northern outlet for Territory cattle. The Cook government lost no time in furthering its policy of supporting a privately owned and operated meatworks in Darwin.

Important events led to this situation. Two big British meat exporters, Bovril and Vestey, with world-wide ramifications and extensive pastoral and meatworks interests, were contemplating the establishment of a meatworks in the Northern Territory. Bovril had, in 1906, given consideration to the establishment of a meatworks on the Victoria River. In 1909 Bovril Australian Estates, established with capital of £A250,000 ($A3m. in present money value terms), purchased Victoria River Downs Station, then of 8,700 square miles.[7]

In 1914 Vestey acquired Wave Hill Station of about 6,000 square miles, adjoining Victoria River Downs on the south. Bovril later

[6] 'Report on Operations Since the Transfer to the Commonwealth, Northern Territory of Australia', *Historical Studies, Australia and New Zealand*, Vol. 6, No. 22, p. 152, May 1954.

[7] Bolton, Survey of the Kimberley Pastoral Industry, p. 153.

extended its northern landholdings, and Vestey expanded their landholdings in the Northern Territory to 27,670 square miles by 1916 and also acquired large estates in East Kimberley, totalling 8,400 square miles which, with subsequent acquisitions in Queensland, made them the biggest landholders in Australia. By acquisition and extension, in New South Wales, Victoria, and Queensland, Vestey also became the biggest meatworks operators in Australia.

In 1914 Vestey signed an agreement for the establishment of a meatworks at Darwin. The agreement that the capital of the company should be not less than £A100,000.

Vestey started the construction of the meatworks in 1914 and slaughtering operations began in 1917. The works were designed to slaughter 500 head of cattle a day but this rate was sustained only for short periods. Available information reveals nothing to show whether Vestey had erred in their estimation of the beef productive potentialities of northern areas of the Territory, or whether they had planned the meatworks in anticipation of early completion of the north-south transcontinental railway. The cost of the completed works, originally estimated at £A100,000 had risen to £A900,000. Costs of labour and materials to operate the works also exceeded early estimates.[8]

To justify the heavy investment in the construction of the meatworks and the costs of its operation, the plant would have had to handle an average of 2,000 head of cattle per week, with peak numbers rising to 2,500. The minimum needed to justify such a large meatworks would have been an annual average of 50,000 head. That number was not then available within the sphere of influence of the Darwin meatworks. In its four years of operation (1917-20) total Territory cattle numbers were between 420,000 and 611,000.[9]

The closing of the Darwin meatworks and the following sequence of depression years and low cattle prices in the beef industry exerted a powerful influence on the pattern of landholding in the Northern Territory areas to the north of the Centre region. In the 1920s, a refine-

[8] Commonwealth of Australia, Report of the Board of Inquiry into the Land and Land Industries of the Northern Territory of Australia, *C.P.P.*, Vol. 4, 'The Darwin Meatworks', pp. 61-4, 1937.

[9] Commonwealth Bureau of Census and Statistics.

ment of the general pattern of cattle movement became evident. Adverse economic conditions forced some individual graziers out of the industry and their holdings were added to those of financially stronger pastoral interests. Large pastoral companies had moved to acquire cattle stations at strategic intervals along the stock route running from the western border areas of the Northern Territory into Queensland, and also fattening properties in Queensland. While this was to the benefit of the big companies who could move cattle during any year at least part of the distance to Queensland, the lessee of a single holding remained largely at the mercy of both seasonal and market conditions which determined whether he could move his cattle over the whole distance or not at all.

In most years the resident grazier (except in Centre region which had a southern outlet, by rail, to Adelaide) started his cattle on the stock route to Queensland, over distances of up to 800 miles, in the hope of selling them *en route*. The sale of cattle on a station delivery basis was a rare occurrence in those times. Consequently, the resident grazier often sought to avoid the risks of overlanding his cattle by selling them to a company possessing a chain of stations. But this increased the control over the small grazier by big interests who were aggressively increasing their holdings. The 1920s marked the consolidation of an era of absentee landholding, the retarding influences of which were manifest throughout the ensuing years.

The sound concept of land occupancy by resident holders, with limitation of cattle holdings to areas of efficient productive size, was reversed and the way was opened to land monopolisation by absentee interests, in this instance to corporations that were mainly of United Kingdom origin. The Territory was very remote from the then seat of Commonwealth government in Melbourne.

THE QUESTION OF LEASES

The terms of transfer of the Territory to the Commonwealth provided that leases of cattle lands granted by South Australia would be recognised by the Commonwealth. Thus, leases granted under South Australian Acts could not be abrogated. In 1922 these leases had from thirteen to twenty-four years to run. It was clearly the desire of the big

absentee holders of forty-two year leases granted by South Australia, without improvement conditions, to secure new leases, also without improvement conditions, for as long a term as could be obtained.

With the confusion of a mixture of Territory land leases of 108,048 square miles and pastoral permits of 43,632 square miles left over from South Australia, and pastoral leases granted under Commonwealth Ordinances of 1912, the result was a chaotic hotchpotch, lacking any semblance of uniformity and presenting administrative problems incapable of solution for want of official action to create uniformity. A measure to establish uniform Territory pastoral lease tenure was proposed with the introduction of an amending Crown Lands Ordinance, which was gazetted on 10 May 1923, to operate from 1 July 1923, under which new leases were to be offered in exchange for surrender of those granted under South Australian Acts and the 1912 Ordinances.

Gazettal of the 1923 Ordinance gave rise to considerable parliamentary protest, particularly by the Member for Northern Territory, Mr H. M. Nelson. The Commonwealth government yielded to this pressure and agreed to open the matter for debate, in a Bill to be introduced with the subject Ordinance as a schedule. The basis of Mr Nelson's attack was that the Minister had discussed with representatives of big absentee holders of Territory leaseholds the principles underlying the Ordinance; that the provisions of the Ordinance, lacking firm structural improvement conditions, would be to the economic advantage of the big landholders but greatly to the detriment of the public interest.[10]

The Bill was introduced in the Senate in July 1923 and was debated in that chamber and in the House of Representatives. It was returned to the Senate on 2 July 1924, practically without amendment, and was withdrawn on 4 July. The slightly amended schedule became Crown Lands Ordinance No. 15 of 1924 and was gazetted on 9 July. The new leases granted under this Ordinance contained neither structural or herd improvement nor pastures protection conditions. The debate was most revealing and provided the first overt indication of political pressure being exerted by financially powerful overseas and Australian absentee interests.[11]

[10] *C.P.D.*, Vol. 106, H. of R., pp. 907-13, 23 May 1924.
[11] *C.P.D.*, Vol. 103, Senate, p. 873, 11 July 1923.

In his second reading speech on the Bill, the Minister for Home and Territories, Senator Pearce, made the following statement, indicative of the pressure that had been exerted: 'By eliminating the improvement conditions and reverting to a stocking condition only, all leases under the new Ordinance will be held on a common basis'.[12]

The elimination of improvement conditions did nothing, as subsequent history shows, to bring about effective pastoral settlement of Territory cattle lands. The new leases were for forty-two years, to 1965. During this period the structural improvement of most of the holdings was quite inadequate and many of the herds degenerated to cattle of nondescript type.

Further evidence of pressure exerted by big absentee holders can be seen in moves in 1948 by the most influential of them — Vestey — for new leases. The matter was mentioned by the Minister for the Interior, in the House of Representatives on 16 September 1948, in the following answer to a question by the Member for the Northern Territory:

> Negotiations in regard to leases held by the Vestey interests were opened with the Government by Lord Vestey in person in January, and have been continued since then by his senior representatives. The issues involved were regarded as of such importance that Cabinet appointed a subcommittee consisting of the Prime Minister, the Minister for Commerce and Agriculture, the Minister for Works and Housing and myself to consider the matter.[13]

Leases under the 1924 Ordinance provided for resumption of a quarter of the area in 1935 and a quarter in 1945, but such resumptions were not effected.[14] The Chifley government came to an agreement with Vestey in July 1948 for the granting of pastoral development leases to be subject to improvement conditions. But this was invalid in law for, at that time, there was no legal foundation for such a lease.

The Bill for the 1948 Ordinance was vigorously attacked by the elected members of the Council, who voted in a block against it. The official members submitted an important amendment which provided for a hearing in public by the Land Board of an application by a lease-

[12] *C.P.D.*, Vol. 107, Senate, pp. 1795, 1900, 3 and 4 July 1924.
[13] *C.P.D.*, Vol. 198, H. of R., pp. 513-15, 16 Sept. 1948.
[14] Crown Lands Ordinance (N.T.) No. 15 of 1924 (gazetted 9 July 1924).

holder for a development lease. The opposition of the elected members was widely noted in the Australian rural press.

The 1948 Ordinance was passed, but it did not become operative as the necessary regulations under the Ordinance were never gazetted. The Minister for the Interior's reasons for failing to render it operative by the promulgation of regulations were not made public.

The Minister for Post-war Reconstruction (Mr J. J. Dedman) and the Director General (Dr H. C. Coombs), accompanied by a party of senior government officials, made an extensive aerial tour of Territory cattle stations shortly after the 1948 Ordinance was under consideration. In a press release of 26 August 1948, Mr Dedman made, *inter alia*, the following observations:

> the Government had committed itself to a policy of investigation in conjunction with the Queensland and Western Australian governments, with the object of facilitating the ultimate development of the area to its economic limits. Intensive research projects into the resources and potentialities of the area are in hand and in some cases well advanced . . . the requirements for development of beef production in Northern Australia were a satisfactory price agreement, adequate transportation to marketing points, improved stock routes and station improvements by way of water provision, fencing and cattle management. Government action alone, however, would not achieve the desired result. I received a very unfavourable impression of present station developments and animal husbandry and a great deal will have to be done by the station owners.[15]

It appears from the critical tenor of Mr Dedman's observations, that he, as a member of the Cabinet sub-committee dealing with the matter, would have pressed for the inclusion of very firm conditions of station structural improvement and efficient animal husbandry in the proposed thirty-year development lease.

In the election of December 1949, the Chifley government was defeated. In 1950 the Menzies government presented a Bill for an amending Crown Lands Ordinance in the Northern Territory Legislative Council. This measure contained the following important provisions:

1. It repealed the pastoral development lease provision of the 1948 Ordinance.

[15] Commonwealth Department of Post-war Reconstruction, Ministerial Press Release No. 29A, 26 Aug. 1948.

2. It eliminated the procedure of public hearing before a Land Board in respect of application for a pastoral development lease.
3. It introduced a new form of tenure — pastoral homestead lease under perpetual title.
4. It imposed further restrictions on companies holding pastoral land to the extent that companies with substantially the same shareholders (75 per cent) were considered to be the same company.
5. It provided for a pastoral development lease term of fifty years.

On 20 March 1951 a roneoed statement 're Northern Territory Leases and Crown Land Ordinances' was circulated to members of the Northern Territory Pastoral Lessees Association (N.T.P.L.A.) by the President, outlining the association's objections to the Ordinance. The following important points of submission were raised in the circular:

> At the conference held on the 5th instant, we submitted a statement which contained what we considered to be substantial reasons why Ordinance No. 2 of 1950 should not be recommended to the Governor General for his assent.
>
> Ordinance No. 2 of 1950 was passed by the Legislative Council of the Northern Territory in defiance, or at least ignoring the Minister for the Interior's statement at the Conference held in Canberra on the 29th April, 1950, that when any major alterations are investigated, we should be consulted. We cannot believe this Government, or the Minister would be party to what can only be considered a breach of faith.
>
> No opportunity was given the Lessees of the Northern Territory for consultation or to submit proposals before the said Ordinance was drafted and passed by the Legislative Council of the Northern Territory.
>
> The Northern Territory is not yet ready for the granting of homestead pastoral leases on any large scale. Even with generous assistance from the Commonwealth Government and/or the Commonwealth Bank, homestead lessees would be faced with great difficulties if confined to one restricted area.
>
> To a very considerable extent the Northern Territory has been developed by companies and while the shareholders in the different companies are not always identical it is only because of the knowledge of, and experience in the Northern Territory of certain men in the Northern Territory that capital can be induced to be invested in such companies the result is that it is often found that there are a considerable number of shareholders in one company who are also shareholders in another company.

Ordinance No. 2 of 1950 was passed by the Legislative Council but it never became the law, as it was not submitted for the Governor General's assent within the statutory period of six months after the Bill was passed by the Legislative Council.

Yet another Bill for an Ordinance, possibly drafted to meet N.T.P.L.A. objections to the 1950 Ordinance, was tabled in the Northern Territory Legislative Council in August 1952. This Bill was debated at considerable length at subsequent sittings of the council and was eventually passed. It became the law as Crown Lands Ordinance No. 4 of 1953.

Prior to the introduction of this Bill, the Northern Territory Administration notified in *Commonwealth Gazette*, No. 44 of 26 June 1952 the setting apart of nineteen pastoral leases for application, of which three composed 3,508 square miles — the eastern part of Victoria River Downs Station.

The minimum improvement conditions attached to the three Victoria region district blocks were as shown in table 2.

Table 2

Stocking and improvement conditions, three Victoria region blocks allocated in 1953

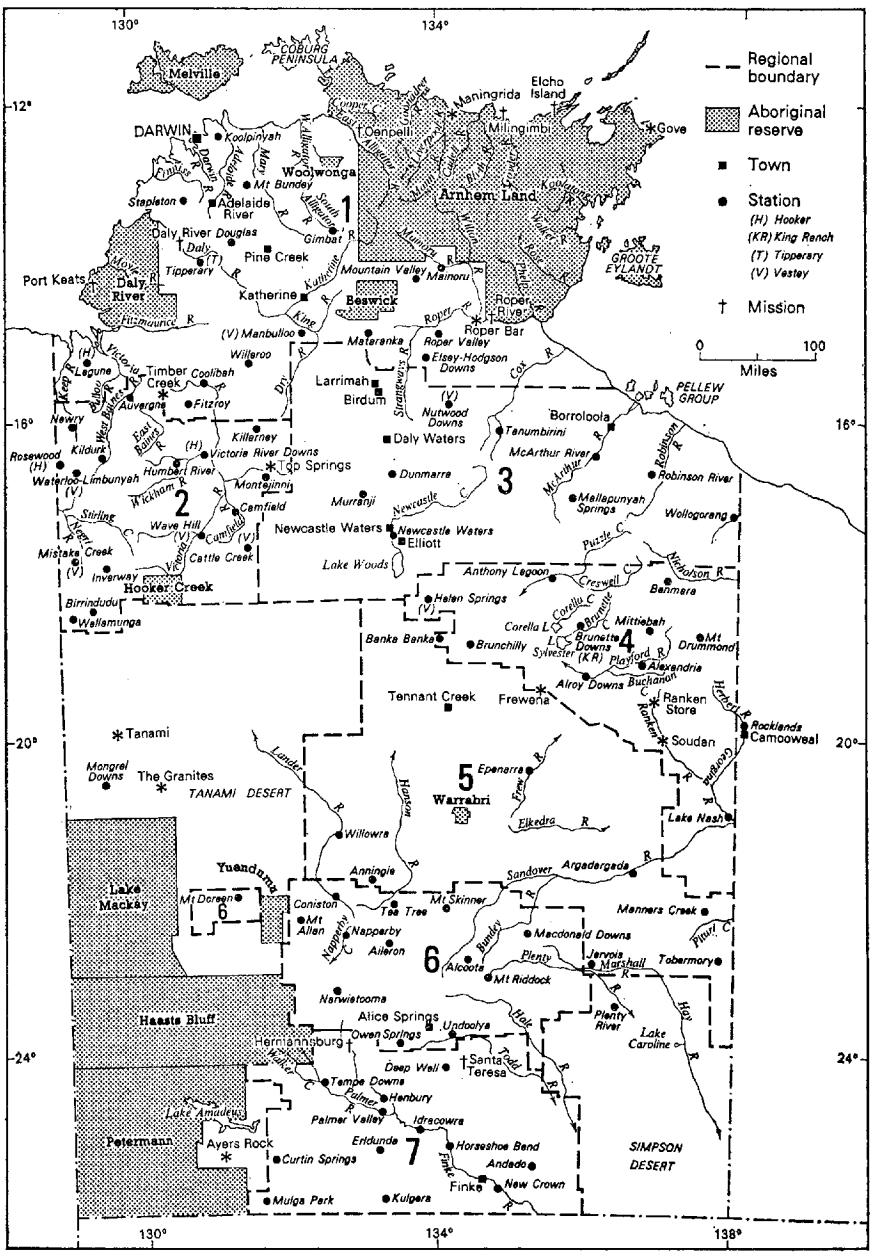
Block name	Stock with cattle by 1963 head per sq. m.	Existing permanent natural waters no.	Minimum made waters no. to sq. m.	Fencing requirement miles to sq. m.
Killarney	8	3	8 = 1:145	115 = 10:100
Montiginni	8	9	5 = 1:260	113 = 9:100
Camfield	10	6	10 = 1:105	126 = 12:100

The B.A.E. had in 1951 adopted the minimum structural improvement standards for the Northern Territory as shown in table 3.

Table 3

Minimum station structural improvement conditions, Northern Territory

Region	Made water points no. to sq. m.	Fencing miles to sq. m.
Centre	2:100	20:100
Barkly	2:100	25:100
Victoria	1: 75	15:100
Arnhem-N.T. Gulf	1:150	15:100



MAP 3 *The Northern Territory*

The structural improvement and stocking conditions shown in table 2 indicate the intention of the then Administrator of the Northern Territory to ensure better use of the Territory's pastoral resources by imposing reasonable structural improvement conditions in future leases, to encourage the resident holding of cattle country in areas of efficient productive size, determined by herd size and carrying capacity rather than merely in terms of square miles.

Crown Lands Ordinance No. 4 of 1953 provided for fifty-year pastoral leases and, most importantly, for pastoral homestead lease, with perpetual tenure, of 'efficient productive' size in defined terms of herd size. Regulation 45A, added by Regulation 5 of 1954, defined an efficient productive unit as:[16]

> the prescribed number of stock which is sufficient to constitute, for each of the areas shown and marked with a number on the plan in the Third Schedule to these Regulations, an efficient productive unit is the number of stock specified in the table to this regulation opposite to the area marked with that number. (See map 3).

Area	Number of stock
1	9,000
2	8,000
3	8,000
4	5,000
5	4,000
6	3,000
7	3,500

Before the introduction of the Bill (Ordinance No. 4 of 1953) representatives of the N.T.P.L.A. had discussions with the then Minister for Territories, Mr Hasluck, on the provisions of the amending Ordinance. This evoked strong criticism by both elected and government nominated members of the Legislative Council, on the ground that the N.T.P.L.A. sought to have the Bill amended before it was submitted to the council.

[16] Northern Territory of Australia, Crown Lands Regulation No. 5 of 12 May 1954, Part IIIA, Pastoral Homestead Leases.

This criticism evidently moved the President of the N.T.P.L.A. to issue the following statement (*Centralian Advocate*, Alice Springs, 6 February 1953) for publication:

> I wish to make it clear to Members of the Northern Territory Legislative Council and to residents of the Territory generally that my Association discussed Crown Lands Ordinance No. 4 with Government representatives in Canberra specifically at the request of the Minister for Territories, Mr Paul Hasluck.
>
> During the debate on this Ordinance in the Legislative Council last week many members criticised this Association and accused its members of discourtesy because they discussed the Ordinance in Canberra instead of with Council members in Darwin.
>
> Mr Hasluck made it clear . . . that this Ordinance was what is known as a 'Government Bill'. In other words, the Ordinance purported to represent Commonwealth Government policy. The Minister invited us to submit our views to him personally, and it seemed logical to conclude that if our submissions were to have any chance of success they must first have the approval of the Minister at Canberra.

Northern Territory pastoral leases, comprising the great bulk of occupied cattle country, were due to expire in 1965. Thus, in the ordinary course of events most of the cattle lands of the Victoria, Barkly, and Arnhem-N.T. Gulf regions held in large leaseholds by non-resident lessees (mainly of overseas origin), would have reverted to the Commonwealth and could have been made available, at little cost, for closer settlement under conditions which would have ensured effective occupancy by resident holders in areas of efficient productive size. The holders of the expiring leases could have claimed no more, by way of compensation, than the use value of existing structural improvements which, with few exceptions, were of little significance.

There is nothing on the public record as to the nature of the N.T.P.L.A. discussions with the Minister or of submissions made to him as to the principles to be incorporated in the 1953 Ordinance. However, the Ordinance, as finally assented to, contained provision which could reasonably be construed as favouring the big holders. Ordinance No. 5 of 1946 provided that no person or interest should hold a pastoral lease which exceeded 5,000 square miles, nor have a beneficial interest therein, but Ordinance No. 4 of 1953, Section 38A(2),

provided that, notwithstanding the limitation to 5,000 square miles imposed by Ordinance No. 5, a person or an interest who, immediately before the date of commencement of the Crown Lands Ordinance 1953, lawfully held or was beneficially interested in Northern Territory pastoral land exceeding 5,000 square miles could legally hold pastoral land in excess of this amount.

Whereas Territory pastoral land held under the Ordinance of 1924 was not subject to any development or improvement conditions, the 1953 Ordinance provided that the Administrator may (not shall), with the consent of the Minister, prescribe the conditions of the proposed lease relating to minimum development work and minimum improvements. Thus, under the Ordinance of 1953 the Administrator could prescribe conditions either stringent or light as he deemed fit: he could convert a lease to a new fifty-year lease with insignificant structural improvement conditions — in short, conditions so inadequate as to be a near repetition of the 1924 Ordinance which carried no structural improvement conditions.

Table 4
*Minimum structural improvement standard, Vestey Territory properties**

Station	Fences miles	'Made' waters points
Waterloo-Limbunya	580	52
Mistake Creek	252	22
Wave Hill	924	82
Manbulloo	223	10
Nutwood Downs	421	19
Helen Springs	521	42
Total	2,921	227

* The 1970 cost of these improvements would approximate $3m.

When negotiations relating to the structural improvement conditions to be imposed under the fifty-year leases to be granted in respect of properties to be retained by Vestey were in progress (January 1954), it was known to the parties concerned that existing structural improvements (fences, water supplies, stockyards, and buildings) were inadequate. Minimum improvement standards established by the B.A.E.

for the four districts of the Territory had been approved as reasonable by the Northern Territory Administrator.

On the basis of my estimate of minimum structural improvement standards, the minimum for the Vestey properties to be retained would have been as shown in table 4.

In November 1951 I made an official assessment of the potential carrying capacity of the cattle country of the Northern Territory with the senior pastoral inspector of the Northern Territory Administration, in a joint station by station study. The assessment was made on the basis of efficient property management, and the following criteria:

1. Station boundaries to be fenced, when not secured by natural barriers (e.g. desert fringes or mountain ranges).
2. Adequate subdivisional fencing and yards to ensure efficient control of cattle and good animal husbandry.
3. Adequate water supply to enable any part of the usable country to be utilised at any time of the year.
4. Provision of rotational relief from grazing of a proportion of the country to allow for regeneration of the vegetation and for erosion control.
5. Adequate cattle dipping or spraying facilities for control of cattle tick and buffalo fly in infested areas.
6. Adequate station buildings for the housing of those engaged in the working of the holding.
7. Continuous infusion of new blood, by the introduction of good bulls, to maintain a high standard of herd quality.

A joint study of the potential of each holding was made and the results were as shown in table 5. The annual average Territory cattle turn-off for the five year period 1947-8 to 1951-2 was 146,000 head, inclusive of slaughterings for town consumption and cattle station use.[17]

By southern Australian and eastern Queensland standards, an overall average Territory potential cattle-carrying capacity of 6·7 head to the square mile would seem to be very low, yet practical cattlemen with a lifetime of Territory experience argued that the *best* of the native pasture country would need to be adequately improved and efficiently

[17] Commonwealth of Australia, *Annual Report on the Northern Territory of Australia*, 1947-8 to 1951-2.

Table 5

Estimated Northern Territory cattle potential, November 1951

Region	Occupied area sq. m.	Cattle population Present head	Cattle population Potential* head	Average per sq. m. Present head	Average per sq. m. Potential head	Potential turn-off† head	Percentage turn-off of potential cattle number
Centre	80,150	213,115	383,338	2·7	4·8	73,700	19·2
Barkly	66,951	346,902	543,094	5·2	8·1	122,145	22·5
Victoria	51,132	305,520	442,300	6·0	8·7	72,896	16·5
Arnhem-N.T. Gulf	49,395	153,173	278,815	3·1	5·6	33,797	12·1
Total	247,628	1,018,710	1,647,547	4·1	av. 6·7	302,538	av. 18·4

* Potential cattle-carrying capacity and turn-off was estimated on the basis of native pasture only. Pasture improvement, e.g. Townsville stylo, was then in early stages of research and experiment by CSIRO Division of Land Research.

† Exclusive of slaughterings for Territory town and cattle station use.

managed to carry an average of 15 head of cattle to the square mile. The estimated regional ranges per square mile were: Centre, 3 to 8; Barkly, 3 to 15; Victoria, 3 to 15; Arnhem-N.T. Gulf, 3 to 12.

The first important test applied of official attitude to the future of Territory development was in the negotiations that ensued, in January 1954, between the Vestey interests and the Department of Territories regarding the proportion to be retained of the 30,758 square miles of Territory cattle country then held, most of which comprised pastoral leases due to expire in eleven years. The results of the agreement reached in the negotiations are reflected in table 6.

Table 6

Areas, cattle capacities, structural improvement conditions, annual rentals of retained Vestey cattle properties

Station	Area retained sq. m.	Cattle-carrying capacity* head	Average annual turn-off head	Improvement conditions† fences miles	Improvement conditions† waters no.	Annual rental‡ per sq. m. cents	Annual rental‡ total $A
Waterloo-Limbunya	3,866	51,000	9,000	120	12	55	2,126·30
Mistake Creek	1,683	17,000	3,300	120	5	60	1,009·80
Wave Hill	6,158	49,000	9,800	100	12	55	3,386·90
Manbulloo	1,489	6,000	900	50	3	40	595·60
Nutwood Downs	1,687	14,000	2,100	120	7	45	759.35
Helen Springs	2,082	27,000	8,000	Nil	Nil	75	1,561·50
Total	16,965	164,000	33,100	510	39	av. 55·6	9,439·45

* Carrying capacity according to Kelly-McInnes estimate of November 1951.
† Information supplied in answer to Question No. 501, House of Representatives, November 1968.
‡ Information supplied in answer to Question No. 2018, House of Representatives, October 1966.

The 1970 cost of the improvements specified in the agreement would be: fencing, 510 miles, $400 per mile — $204,000; waters, 39 points, $8,000 each — $312,000; total $516,000.

This agreement not only committed the government to the granting of leases over a vast tract of cattle country to the year 2004, but it completely negated the progressive outlook manifested by the Northern

Territory Administrator in 1952 regarding the imposition of reasonable station improvement standards as a condition of the granting of new leases.

The details of agreements negotiated with other pastoral companies, in respect of the granting of new fifty-year leases, have not been disclosed. However, it would be reasonable to assume that the minimum structural improvement conditions imposed in respect of their new leases would have been no more onerous than in the case of Vestey.

In my opinion, this agreement set the development of the Territory cattle industry further back than did any other event in its history, further even than the circumvention of the Crown Lands Ordinances passed by the Territory Legislative Council in 1948 and 1950.

A further example of privilege enjoyed by Vestey interests was revealed in the House of Representatives, on 6 November 1968, when the Attorney General gave the following answers to questions asked by a member of the Opposition:

> On 5 June 1953 a writ of summons was issued out of the New South Wales Registry of the High Court of Australia on behalf of the North Australian Meat Company Limited against the Commonwealth of Australia claiming compensation in respect of the acquisition by the Commonwealth on 17th January 1946 and 15th May 1947 under the Lands Acquisition Act 1906-1936 of certain lands situated at Parap near Darwin on which a meatworks was erected . . .
>
> The Action claimed compensation under the Lands Acquisition Act 1906-1936 in respect of the lands acquired. The total amount claimed was £1,734,144 [$A3,468,288] together with interest thereon at the rate of 3 per centum per annum calculated from the respective dates on which the several parcels of land had been acquired . . .
>
> Evidence was given by Mr R. A. Vestey that he was the sole manager of a settlement dated 25th March 1942 the trustees of which held all the issued share capital in the North Australian Meat Company Limited . . .
>
> The evidence of Mr R. A. Vestey was taken in London pursuant to an order made in that behalf by His Honour the Chief Justice of the High Court, Sir Owen Dixon, on 30th November 1955 on the application of the company. *The Commonwealth strongly opposed the making of the order and submitted that the evidence should be given before the trial judge in Australia* . . .
>
> The terms of settlement dated 26th March 1956 provided for the Commonwealth to pay to the company £250,000 [$A500,000] in full

settlement of all claims (known and unknown) which the company might have against the Commonwealth (including any of its servants, or agents) in relation to the compulsory acquisition of the company's land or interests in land at Darwin and of the plant, machinery and fittings on the property and for any occupation damage done to or plant removed from the premises and of all other claims which might have arisen in connection with the meatworks. The company had the right to remove within six calendar months of the date of the terms of settlement any plant, machinery and fittings on the land. Each party was to bear its own costs of the High Court proceedings. The amount of £250,000 [$A500,000] was paid to the company on 1st June 1956.[18]

The settlement for $A500,000 was calculated by the Commonwealth as $A400,000 compensation and $A100,000 statutory interest from date of acquisition.

The N.T.P.L.A. was still not satisfied with the substantial gain obtained in the granting of fifty-year leases, with insignificant station improvement conditions. Following the death of its president, Mr F. A. Brodie, Vestey's pastoral superintendent became president of the N.T.P.L.A. and, later, chairman of the Northern Territory Cattle Producers Council. Moves aimed at conversion of the fifty-year Territory pastoral leases to freehold were initiated by the Cattle Producers Council, of which the N.T.P.L.A. was the most influential member.

Early in 1964, a deputation from the council waited on the Minister for Territories, Mr Barnes, seeking the right to convert existing leaseholds to freeholds. Mr Barnes appeared to favour the request and undertook to give it sympathetic consideration. This was widely reported in the Australian press. Under the heading 'N.T. Plan Mine Says Barnes — Conversion to Freehold' the *Melbourne Herald* of 13 April 1964 commented: 'The Minister for Territories, Mr Barnes, today accepted full responsibility for a proposed scheme to convert large areas of the Territory from leasehold to freehold title. He said the proposal had originated since he had assumed the Territories portfolio last year'. This was followed the next day with another, and more critical, *Melbourne Herald* article under the heading 'The Great Land Grab'.

On 14 April Mr J. N. Nelson moved an urgency motion in the House

[18] *C.P.D.*, Vol. 61, H. of R., p. 2674, 6 Nov. 1968 (my italics).

of Representatives in which he roundly condemned the proposal.[19] The debate was promptly closed with the Minister's brief reply, which put an end to the freehold proposal.

THE COST TO THE TAXPAYER

By comparison with Queensland and Kimberley pastoral areas, Territory pastoral leaseholders have been generously treated, at heavy cost to the Australian taxpayer. Annual rentals, to 1967, were very low at an average of 48 cents per square mile. The overall annual rental cost per beast-area was 13 cents. The cost to leaseholders of properties with higher carrying capacities of, say, 10 to the square mile, was as low as 4 cents per beast-area.[20] (Territory rentals were increased by re-appraisement in 1968, four years after the due date.)

Territory pastoral leaseholders do not pay local government rates, whereas in Queensland and the Kimberleys, annual shire rates often exceed annual rentals. In the Territory, 1967 rentals of pastoral leaseholds totalled $A139,802. In that year, expenditure on repairs and maintenance of water supplies, roads and stock routes for pastoral purposes ($A859,998) and roads for transport of beef cattle ($A499,680) amounted to $A1,359,678, exclusive of $A1,399,735 for repairs and maintenance of Stuart (Alice Springs-Darwin) and Barkly (Tennant Creek-Camooweal) highways.[21]

For the fifteen-year, 1937-52 period, income derived from cattle raising in the Territory was not subject to tax. Section 23(m) of the Income Tax Assessment Act provided that, from July 1937, primary producers would be exempted from payment of tax on 'that income directly, and in the first place, derived from primary production in the Northern Territory by a resident of that Territory'. The object of this exemption was to encourage resident occupiers to improve their stations by investing monies that otherwise would have been payable

[19] *C.P.D.*, Vol. 41, H. of R., pp. 1076-9, 14 Apr. 1964.

[20] 'Beast-area' is defined as the area of land required for carrying a beast the year round. 'Beast' is defined as an adult dry cattle equivalent. The following equivalent is from D. N. Sutherland, Symposium on Brigalow Lands of Central Queensland, ANZAAS, 37th Congress, Canberra, Jan. 1964: $\frac{1}{2}$ — $1\frac{1}{2}$ years = 0·6; $1\frac{1}{2}$ — $2\frac{1}{2}$ years = 0·8; over $2\frac{1}{2}$ years = 1·0; cows and calves = 1·16; bulls = 1·16.

[21] Commonwealth of Australia, *Annual Report on the Northern Territory*, 1966-7

as income tax. Non-resident holders of cattle properties were taxed in the ordinary course. In 1946, the Waterloo Pastoral Company Ltd (Vestey owned) appealed in the High Court against an assessment of tax on income derived from cattle production on Waterloo Station (of 3,908 square miles, carrying 40,000 head of cattle). In opposing Vestey's appeal, Counsel for the Commissioner of Taxation argued that the purpose of Section 23(m) was to assist residents of the Territory engaged in primary production. The trial judge upheld Vestey's appeal. In the course of delivering reserved judgment, the judge commented: 'I am of the opinion that the Company was resident in the Northern Territory whether or not it was also resident in Sydney'.[22]

The North Australia Pastoral Company, absentee holders of Alexandria Station (then of 11,262 square miles, carrying 70,000 head of cattle) were also successful in a similar High Court appeal.[23] The benefits derived by the successful appellants were extended to all other Territory absentee cattle station holders. These benefits amounted to hundreds of thousands of dollars that would otherwise have been paid in tax. Very little of the substantial saving was invested by the absentee holders in the improvement of the stations, which was the intended purpose of the concession.[24]

The Northern Territory differs significantly from the rest of rural Australia, in that it cannot build up a substantial human population on the foundation of its pastoral resources alone. Its greatest promise lies in combining development of the pastoral resources with the mineral resources, of which bauxite, copper, silver-lead, iron ore, and uranium are known to be of considerable extent.

With vigorous development of mineral, pastoral, and agricultural resources, combined with industrial processing and sound public administration, the Territory could become self-supporting and fully self-governing before the end of this century.

If the record of past occupancy and utilisation of Territory pastoral lands under Commonwealth administration is to be the guide to the

[22] *C.L.R.*, Vol. 72, p. 267, 1945-6.

[23] *C.L.R.*, Vol. 71, p. 624, 1945-6.

[24] My observation of structural improvements on Northern Territory cattle stations.

future, there is little reason to expect that the cattle potential of the Arnhem-N.T. Gulf regions will be achieved over the remainder of this century. The Commonwealth government is the sole custodian of the Public Estate in the Northern Territory. It is the sole authority for pastoral lands administration. Most bills for amending Crown lands ordinances originate in the administering department (currently the Department of the Interior) in Canberra, for consideration by the Territory Legislative Council. It has, in the final analysis, responsibility for all Territory legislative enactments. There can be no doubt as to its responsibility for ensuring that the pastoral resources of the Territory are adequately and protectively utilised.

But for the greater part of the period since responsibility for Territory administration was assumed by the Commonwealth, in 1911, the facts of history show that its record in lands administration has been a combination of ineptitude and mal-administration. A recent example of mal-administration was revealed by the Commonwealth Auditor General in his report for the year 1968-9, tabled in the House of Representatives on 19 August 1969, in the following reference:

> Because rentals due for re-appraisal in the years 1963 to 1967, together with one due in 1960, were not notified to the lessees until June 1968, with effect from 1 July 1968, revenue in excess of $137,000 has been lost to the Commonwealth.[25]

The present lack of leasehold conditions which could ensure development of the pastoral resources of the Territory is consistent with the action of the then Minister in charge of Territory affairs in initiating legislative measures, under a Crown Lands Ordinance of 1924, to abolish then existing leasehold conditions on the pretext of establishing uniformity (thus reverting to the position under South Australian administration); with the failure of Mr Hasluck, under Crown Lands Ordinance No. 4 of 1953, and Mr Barnes, under Crown Lands Ordinance No. 2 of 1967 to impose such leasehold conditions as would ensure the effective (and protective) utilisation of the Territory's pastoral resources.

[25] *C.P.P.*, No. 72 of 19 Aug. 1969. Annual Report of the Auditor General for 1968-9, p. 130.

Despite ministerial acknowledgment of a realisable potential of a million head of cattle in Arnhem-N.T. Gulf regions, with an annual turn-off of 250,000 head (substantially larger than the twenty-year average of entire Territory turn-off), with comparable potential, in Arnhem Region Aboriginal reserves, there is nothing in the record of Territory lands administration to encourage optimism as to the likelihood of early positive governmental action being taken towards achievement of those potentials.

From 1949 to 1969, the area of cattle lands held *under pastoral lease* increased from 203,400 square miles to 289,400 square miles (an increase of 42·2 per cent). During the same period, cattle numbers increased from 1·052m. to 1·185m. (an increase of 12·5 per cent).[26]

With such an increase in the area of pastoral leasehold, there has actually been a substantial per-square-mile reduction in cattle carried and turned-off. Taking into account the heavy public investment in plant and animal industry research and improved transport facilities, a depressingly negative result, in terms of cattle carried and turned-off, must be acknowledged.

[26] 1949 statistics from N.T. Administration, *Annual Report for 1949;* 1969 statistics from Bureau of Census and Statistics, *N.T. Statistical Summary*, 1970.

3

THE KIMBERLEYS: A NEGLECTED REGION

IT is more than eighty years since beef cattle herds were established in the Kimberley region of Western Australia. At the beginning of settlement, in the 1880s, the Kimberley pioneers had held great expectations of a thriving pastoral industry which, however, did not materialise. At the turn of the century, Kimberley cattle numbers totalled 205,000 head, rising to a peak of 668,000 in 1917 when markets were restricted and cattle turn-off was low.[1] At that time, despite the uncontrolled increase in cattle numbers, native pastures were still abundant. Although the frontages of the two principal river systems — the Ord in East Kimberley and the Fitzroy in West Kimberley — had a good cover of native grasses and herbage at the beginning of this century, over-grazing of particular areas had already started what was subsequently recognised as severe soil erosion.

Cattle raising in the Kimberleys was established on the open range system, though early efforts were made on a few stations to secure some control of cattle, and provide paddocks for working horses, by limited fencing and supplementary water supplies. But the open range system still operated in 1970.

[1] Bolton, Survey of the Kimberley Pastoral Industry, Appendix VI, pp. 19, 115-17.

Up to 1919, when a government operated meatworks was established at Wyndham, the principal outlet for East Kimberley cattle was by shipment to Fremantle, for the Perth domestic market; to South-east Asian destinations and to Africa; and overland by stock route across the Northern Territory to Queensland and, in some cases, to New South Wales. With the exception of 1921, and the war years 1942-4, when East Kimberley cattle were walked to Katherine, in the Northern Territory, for slaughter to provide beef for the armed forces, the meatworks at Wyndham operated continuously, the killing season usually covering a May-September period of about sixteen weeks.

The principal outlet for West Kimberley cattle, up to 1942, was by ship to Fremantle and to South-east Asian destinations. In 1942 a small meatworks was established by a private company, supported by the Western Australian government, at Broome, the coastal shipment of cattle becoming difficult under wartime conditions. In 1949, a privately owned inland abattoir was established at Mt House-Glenroy Station in West Kimberley — Airbeef Pty Ltd — the slaughtered carcasses being chilled at the abattoir and then flown to Wyndham meatworks, and later to a subsidiary plant in Derby, for freezing and export. (Mt House-Glenroy is now owned by King Ranch interests.)

As in the case of the Northern Territory, and Qld Gulf-Peninsular-Channel regions, a large proportion of Kimberley cattle country was held in large single leases or aggregations by overseas and Australian absentee pastoral companies. There was neither freehold nor perpetual leasehold, leases being for a fifty-year term due to expire in 1983 (extended to 2015 by a Land Act amendment of 1963). Nowhere in the Kimberleys was there in 1963 adequate station structural improvement; no station was boundary fenced, adequately internally sub-divided, or furnished with adequate supplementary stock watering facilities. Although much of the Kimberleys was infested by the cattle tick in varying degrees of intensity, there were few cattle-dipping facilities in operation on the stations.

Individual cattle holdings varied in size from 150 to 1,600 square miles, the bulk being in the 750-1,500 square mile range. The Vestey-controlled East Kimberley aggregation of 8,400 square miles was the

largest in the Kimberley region. Herd sizes on individual stations varied between 1,600 and 50,000 head. The largest aggregation of cattle in East Kimberley was of approximately 90,000 head and in West Kimberley of approximately 59,000 head.[2]

Over the long period of operation of open range, uncontrolled grazing, soil erosion and pasture denudation in the best of the grazing country, particularly in the upper Ord River valley, grew progressively worse, permanently lowering the native pasture cattle-carrying capacity. In good seasons of above average rainfall, calving rate and branding survival were well above normal with corresponding increase of cattle numbers to unsafe levels, because of inadequate watering points and fencing. With periodical change to seasons of substantially below average rainfall, many surface waters failed, with the inevitable result of over-concentration of grazing around remaining waterholes and heavy cattle mortality. The erosion caused by the over-grazing of the Ord River watershed led to pasture denudation of some of the best cattle country in the Kimberleys and posed a positive siltation threat to any future large-scale water conservation project for irrigation.

From my survey I estimate that, up to the end of World War II, cattle prices and annual turn-off were low in the Kimberleys. The number of cattle treated annually at the Wyndham meatworks averaged about 30,000 head, of which 10,000-11,000 came from the Victoria region. The cattle prices at the Wyndham meatworks over the 1919-42 period averaged about $10 per head. From 5,000 to 7,000 head of East Kimberley cattle moved annually into and/or across the Territory to Queensland fattening areas. The annual East Kimberley cattle turn-off averaged about 27,000 head.

In West Kimberley, the annual turn-off averaged about 22,000 head, the bulk of which were shipped south, alive, for the Perth domestic trade. On the average, net on-station returns for West Kimberley cattle were somewhat, but not substantially, higher than for East Kimberley.[3] In 1960, I estimated the potential average native pasture cattle-carrying

[2] Information obtained by me in a station by station survey in 1949. See B.A.E., *Report on the Beef Cattle Industry in Northern Australia*, 1952.

[3] Ibid.

capacity of the Kimberleys, excluding West Kimberley areas used for woolgrowing, at 800,000 head, carried on approximately 93,000 square miles, with a potential annual average turn-off of 120,000 head.[4]

EARLY SETTLEMENT

The first station in East Kimberley to be stocked with cattle was Ord River Station, held by William Osmond and John Panton. They purchased 4,000 head of cattle in Queensland in 1882, which were overlanded to Ord River where they arrived in mid-1884. They were followed by the Duracks and their associates who established Lissadell and Argyle in East Kimberley and Rosewood on the Northern Territory side of the Western Australia border, with 8,000 head of shorthorn cattle from the Channel region. This movement took more than two years, covering an estimated overlanding distance of 3,000 miles.

A still longer trek was undertaken in 1882 by the MacDonald brothers, who established Fossil Downs Station in West Kimberley. They started with a mob of cattle from the Goulburn (New South Wales) district, but these died *en route*. More cattle were purchased in Queensland, but heavy losses were again sustained, mainly caused by redwater fever when traversing tick-infested areas. The only member of the party to complete the journey was Charles MacDonald, who arrived at Fossil Downs in 1885 with the surviving 300 head of shorthorns, the foundation of the present Fossil Downs herd.

As with the early experience of the Northern Territory, the original Kimberley pioneers were doubtless strongly influenced by the glowing reports of early explorers, notably Alexander Forrest, a surveyor who was instructed by the Western Australian government to explore the country between the De Grey River in Western Australia and the Victoria River in the Northern Territory, and report on its possibilities for pastoral development.

Forrest carried out his hazardous task in 1879, following which he reported the location of 39,000 square miles of first class pastoral land.

[4] Ibid. Appendix C gives an estimated cattle potential of 604,000 head carried on 56,968 square miles (native pasture basis). Following a further station by station survey in 1960, I made a fresh estimate of 800,000 head on 93,000 square miles. This estimate was used in the 1961-4 economic evaluation, by the B.A.E., of Kimberley Region beef road proposals.

Forrest's reports of the country he had explored were not as exaggerated as those of McDouall Stuart in respect of northern areas of the Northern Territory. They were expressed, however, in over-optimistic terms and were given wide publicity in the eastern states. This publicity doubtless influenced Patrick Durack and Isadore Emanuel to organise a party to carry out a further exploration with a view to establishing cattle stations in the Kimberleys if Forrest's optimism was borne out.

An exploration party was duly organised to inspect the Kimberley pastoral lands reported on by Forrest. The party landed on the western shore of Cambridge Gulf (opposite the present town of Wyndham) in August 1882. The exploration from this point, following the Ord River southwards in the general direction of Halls Creek, thence westwards to Beagle Bay (to the north of Derby), was no less hazardous than was that of Forrest's party and took six months from point to point. The return journey was via Perth where leases were negotiated.

Subsequent experience did not bear out the optimism engendered by these explorations. There is no doubt that the plain and downs country of the Ord and Fitzroy river systems was well grassed. The heavy black clayey plains of the near-coastal areas were mainly grassed with a coarse type of Mitchell grass ('bundle-bundle') and abundant Flinders grass. The Mitchell-Flinders grass pastures of the downs country further inland were less coarse and of relatively higher nutritive quality.

Experience gained, as cattle numbers built up by natural increase, taught the lesson that the safe level of native pasture carrying capacity in the Kimberleys was governed by dry rather than wet season pastures, the normal dry season being of eight months (usually April-November) duration, but sometimes extending to ten or eleven months.

Average annual rainfall showed a high degree of variability, clearly indicating that adverse seasonal conditions were of not infrequent occurrence. With the operation of the open range system of grazing under adverse seasonal conditions, without regulated joining of bulls and regular weaning of calves, the average rate of calf survival to yearling age, per hundred breeders joined, was of a low order of 40 per cent and annual breeder mortality exceeded 10 per cent.

PUBLIC ADMINISTRATION

Long before the end of the last century, it was recognised throughout the remote regions that mid-year generally marked a pronounced downturn in the nutritive level of native pastures, which progressively deteriorated until new growth occurred following the onset of the wet.

With breeders enduring a dual stress of lactation and pregnancy at a period of the season when the diminishing native pastures could not maintain the condition of dry cattle, the rates of natural increase, under the prevailing near-primitive open range conditions, and cattle turn-off were low. This has been recognised throughout the history of cattle grazing in the Kimberleys. Over the five-year, 1964-8 period, with alternative market outlets, keen competition, and good prices, annual turn-off has averaged approximately 60,000 — still low at about 11 per cent of the average cattle number of 550,000.

An appreciation of uncontrolled, open range grazing can be obtained from the following remark by Professor Bolton:

> At the Ord River station, the stock, although exclusively depastured on the riverside flats which constituted but a small portion of the run were breeding fast. One old stockman describes them as 'doubling their numbers every four years'; and it seems certain that from 4,000 in 1885 the herd increased to an estimated 30,000 in 1896 and 47,000 at the *bangtail* muster in 1901-2.[5]

Professor Bolton's reference to the rapid build-up of Ord River Station cattle numbers, depastured on the riverside flats, is fortified by the following extracts from the 1963 Report of the Pastoral Leases Committee, appointed by the government of Western Australia to report on matters relating to the pastoral industry:

> By 1927 returns to the grower from Wyndham had edged up to £3.18.0d per head, whilst prices at Fremantle averaged £19.7.0. Properties in East Kimberley deteriorated further, and few improvements were being effected due to absentee ownership and low returns.
>
> The depression years saw further decline in the beef industry. In West Kimberley there was a general change to sheep and the number of sheep

[5] Bolton, op. cit., p. 77. 'Bangtail' means shortening the bushy end of the tail of mustered cattle.

shorn rose from 193,863 in 1929 to 293,645 in 1935, reaching a maximum of 315,000 in 1940.

In 1932, a Committee was appointed by the Western Australian Government to consider the future development of the area. Its recommendation was extension of leaseholds (due to expire in 1948) to 1998 in the Kimberleys.

The Government introduced legislation extending all leases to 1982.[6]

A further extract from this committee's report indicates the extent of recovery of the Kimberley beef industry in the post-war years: 'In 1949-1951 the Kimberleys were marketing over 50,000 head of cattle annually, a figure never known to have been exceeded in "the past".'

The history of public estate administration in the Kimberleys has been one of continued neglect resulting in serious and possibly lasting pasture denudation and soil erosion in the valleys of the Ord and Fitzroy rivers. Administrative ineptitude has been evident in persistent disregard for that part of the Western Australia Land Act which provided that the maximum area of pastoral leasehold held by one or more persons or association of persons shall not exceed one million acres.

The extent of disregard for this provision was exposed in October 1963 by Mr F. S. Wise, then Leader of the Opposition in the Western Australian Legislative Council (formerly State Minister for Lands and Premier, and Administrator of the Northern Territory from 1951 to 1956). This was during the debate on the second reading of a Land Act Amendment Bill, under which pastoral leases due for expiry in 1982 were extended by a new fifty-year lease from 1965 to 2015.

In the debate on the second reading, Mr Wise drew attention to the extent to which the particular provision of the Land Act, limiting the area that could legally be held by any person or interest to a maximum of 1m. acres, was being flouted:

I am brought to the point of what section 113 of the Land Act provides. It reads —

'The maximum area held under pastoral lease by one person, or by two or more persons jointly, or by any association of persons incorporated or unincorporated, shall not exceed one million acres; and the Government

[6] Western Australia, Report of the Pastoral Leases Committee, pp.11-12, 1963, Govt. Printer, Perth.

may, in specified districts or localities, fix the maximum area to be held as aforesaid at less than one million acres.'

Those words, originally intended and read as being very explicit on the point, have as years have passed been amended and modified to suit the holdings of company interests. Surely they were never meant to be a shield for a number of associated companies — really one company in some cases, and one ownership under many different names — to operate under. Some of the shareholders are not even known to the Lands Department. Further, the penal clauses of the Act in all those cases have never been operative.

Indeed, judging by the answers given by the Minister . . . in regard to the holding companies, it is obvious that section 113 of the Land Act has not only been violently flouted, but flagrantly and wilfully misused, without the Lands Department having any knowledge of where the shareholders are or whether their limitations conform with the requirements of the Act.

Let me refer to some of these interests. I refer to properties in the Kimberleys, some of which are in excess of 900,000 acres. They include Turner Grazing Pty. Ltd.; Ord River Ltd.; Flora Valley and Margaret Ltd.; Gordon Downs Ltd.: Sturt Creek and Sturt Pastoral Coy Ltd., and Nicholson Grazing Pty. Ltd.: All of those, plus many more in the Northern Territory, come under the wing, protection and control of the company known as Australian Investment Agency otherwise known as Vesteys Ltd. . . .[7]

If there were a loophole which allowed the intention of section 113 to be legally flouted, the proper time to have closed such a loophole was when the Act was amended in 1963, when the flouting of the provision was revealed by one of such undoubted standing in the matter as Mr Wise.

As regards pasture denudation and soil erosion, it has long been known that the native pasture resources of the Kimberley and Victoria River regions have been in decline. This deterioration was revealed by W. H. Maze, a Sydney University geographer, who carried out a field study in the upper Ord watershed (part in the Territory and part in East Kimberley) in 1944.

> The most striking and persistent feature of the whole area is the widespread occurrence and severity of soil erosion. Before the area was taken up for cattle grazing (fifty-five to sixty years ago) the vegetation was a grassland and savannah woodland association where Mitchell and Flinders grasses were abundant. Now most of the perennial grasses are gone and a large proportion of the trees are dead. During the dry season of 1944 the land-

[7] *W.A.P.D.*, Vol. 165, Legislative Council, pp. 2092-3, 29 Oct. 1963.

scape was bare and brown over most of the area between Ord River and Turner River stations. Examination of the soil profiles would indicate that 4 to 12 inches of topsoil have been stripped from large areas, by the combined action of wind and water.[8]

Year by year this became increasingly evident. Finally, the Western Australian government took drastic action to arrest this devastation when its extent was revealed in the State Parliament in October 1963 and later, when it became evident that continuing erosion constituted a positive siltation threat to the proposed Ord River water conservation scheme. Preliminary measures to contain the erosion were instituted in the early 1960s, but these were found to be ineffective. In March 1967 the government of Western Australia resumed 3,280 square miles, composing the Western Australian part of the Ord watershed, which covered the whole of Ord River and Turner River Stations and 625 square miles of Flora Valley Station, all of which were held by the Vestey interests.

In 1969 the Western Australian Department of Agriculture described in graphic detail the extent and cause of erosion in the Ord River catchment area, and measures being taken to arrest erosion and to restore the vegetative cover of eroded areas (map 4).

Of the 17,800 square miles of Ord River catchment area, an estimated 1,450 square miles of country is subject to varying degrees of erosion. This lies astride the Ord River and its major tributaries . . .

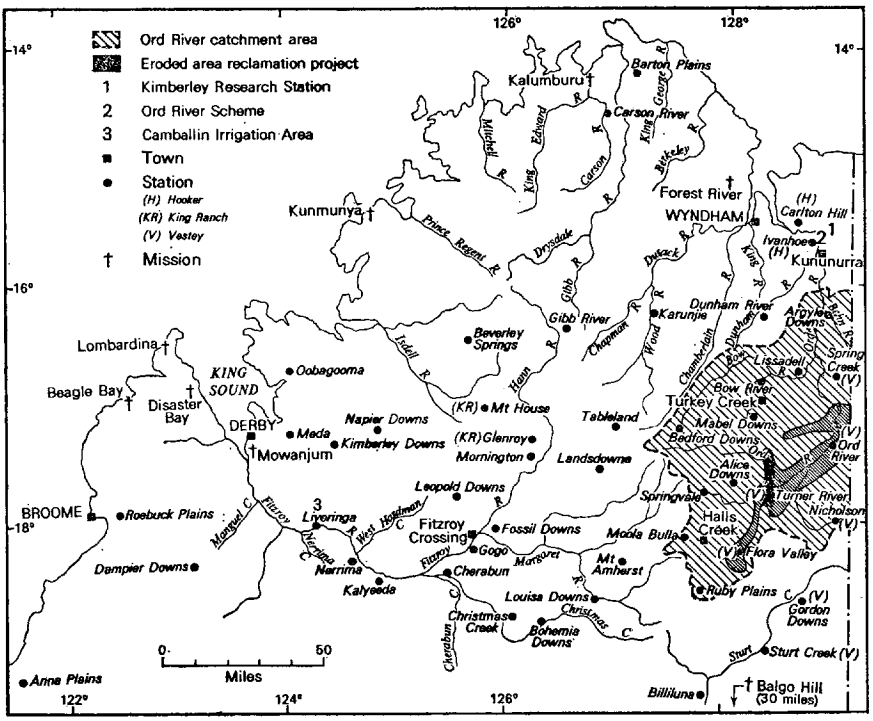
The erosion-susceptible area was accurately defined by a Lands Department survey as long ago as 1944. It was subsequently detailed and soil types were defined in a CSIRO Land Research survey in 1952 . . .

Severe erosion of the Ord River catchment area poses a potential siltation threat to the proposed main dam on the Ord River — basis of the Ord River irrigation project.

The Department of Agriculture's Ord River Catchment Regeneration Project was started in 1960 to halt the erosion, eliminate the threat to the planned Ord River Dam and to bring valuable grazing land back into production . . .

There is little doubt that the basic cause of the erosion of the Ord River catchment area was the removal of vegetative cover by the consistent and continuous overgrazing by both stock and vermin on susceptible soil types in an area of marginal rainfall. Fire and drought have also played their part . . .

[8] W. H. Maze, 'Settlement in the Eastern Kimberleys, Western Australia'. *Australian Geographer*, Vol. 5, No. 1, pp. 1-19, June 1945.



MAP 4 *Kimberley region, W.A.*

Open range grazing has applied throughout the area and apart from a horse paddock and a bullock paddock, fencing on the project area was virtually non-existent. Some 450 miles of new cattle fencing has been constructed to contain the eroding area and divide it into 18 paddocks. Admittedly, some of these are large, but they do facilitate mustering and make grazing control possible. A further 100 miles of fencing was erected in 1967 to protect the eroding Elvira valley, south of the original project area . . .

There is little doubt that the protection from grazing has been the greatest single factor in the success so far achieved. Degraded areas where cultural operations were not necessary have responded well to protection, and after three or four years, are in good order. This is particularly true of the degraded 'black soils' where the perennial Mitchell and blue grasses have reappeared . . .

Actual fencing costs on the project are estimated at 22 cents per acre, where about a million acres have been enclosed and subdivided with 550 miles of fencing . . .

> Although much has been done towards regenerating this area, much still remains to be done before the project can be considered a complete success.
>
> The areas under treatment have been resumed and gazetted as Water Catchment Reserves.[9]

The serious state of erosion in the Ord Valley was known to the Western Australian government for many years. Yet it was not until 1960 that measures were taken to arrest the erosion and pasture denudation. It took twenty-three years for the government to take the necessary step of resuming the affected area, and then, apparently, only under the glare of unfavourable publicity.

A recent example of the flouting of the provisions of section 113 of the Western Australia Land Act was revealed in the *Canberra Times* of 6 December 1969, under the heading: 'The Big (Secret) Deal in the Kimberleys'. This referred to the purchase by the American-owned Australian Land and Cattle Company (Alcco) of six stations in West Kimberley, totalling 6,660 square miles including 87 square miles of freehold farming land of the Camballin irrigation project. The article contained the following comments:

> Most criticism is being directed at the circumvention of the Land Act. A loophole was found, and the State Government approved the company's scheme, but it was outside the spirit of the Act . . .
>
> After approval had been given, the Minister for Lands, Mr Bovell, strengthened the Act early this year to control the acquisition of king-size areas . . .
>
> The Government had approved the transfer of interests and had subsequently introduced legislation designed to control the acquisition of big pastoral areas which were considered to be against the spirit and intention of the Act. Mr Bovell said that the Alcco proposals had brought to his notice the need for amendments . . .
>
> Since the Act was amended, the Government had not approved any share transfers like those in the Alcco scheme. Mr Bovell said that the Government did not accept the principle that an individual or a body should control more than one million acres. This was the reason for the autumn session amendments. . . .

The *Financial Review*, in an article of 28 September 1970, reported at length on the Alcco project, from which the following are quoted:

[9] Fitzgerald, *Ord River Regeneration Project*, pp. 1, 2, 6, 8, 12, 19.

> The Australian Land and Cattle Co Ltd is planning to invest about $18 million in the project, which is based on seven cattle stations covering 4,260,000 acres and a dam on the Fitzroy River . . .
>
> If its highest expectations are realised it will start an agricultural revolution which will transform the Kimberleys as surely as the iron ore discoveries have transformed the Pilbara . . .
>
> Alcco's calculations of profitability are based on bringing cattle from the open range at about 450 to 600 lb and raising their weight by 250 lb over 150 days in holding paddocks on Liveringa station adjoining the feed yard division before putting them on full feed.
>
> They will then be raised to 1,000 lb weight in the feed yard over an average period of 200 days and trucked 82 miles to Derby for slaughter and export.

As to the Western Australian government's trusteeship of the public estate in the Kimberleys, an unpalatable fact, in the context of planning for the future, must be faced: that upwards of 70 per cent of the cattle potential and the best of the pastoral country is controlled by absentee interests, predominantly of overseas origin. A heavy price has already been paid by the taxpayers of Western Australia (with more to come) in the measures now in operation for reclaiming the devastion of soil and pastures in the Ord River valley over the past fifty years. To say the least, this devastation, and the flouting of the acreage limitation imposed by section 113 of the Land Act, had been condoned for far too long.

In terms of cattle numbers, little progress has been made in the Kimberleys since numbers passed the half-million mark (512,000) in 1910. The five-year average to 1919 was 615,000; the five-year average to 1969 was 550,000.[10] I estimate the combined native and improved pasture cattle potential (excluding Ord River and other large-scale irrigated pasture) of the Kimberleys at 1·2m. head. In my opinion, this potential will not be achieved under the existing system of land occupancy and utilisation.

The history of events in the administration of the public estate in the Kimberleys over the past twenty-five years makes a mockery of the progressive northern development programs formulated by the N.A.D.C., approved by Mr Wise as Premier of Western Australia but denied by his successors.

[10] Bureau of Census and Statistics, Western Australian Office.

4

THE ROLE OF THE COMMONWEALTH IN RECENT YEARS

AT the end of World War II it became clearly evident that the role of the Commonwealth in northern Australian development would be increasingly important, particularly in the light of the larger measure of control of the nation's finances cast upon it with the advent of uniform taxation, as a wartime measure, in 1942, and the probability that this would endure indefinitely beyond the war's end. The importance of the Commonwealth's role in beef industry development in northern Australia has been borne out by the history of the 1945-70 period.

THE NORTHERN AUSTRALIA DEVELOPMENT COMMITTEE

Of special significance to the future development of remote regions of northern Australia was a submission made by the Prime Minister, in October 1944, at a conference of State Premiers, when he drew attention to the undeveloped state of remote regions of northern Australia and to the urgent need of development of those areas in Commonwealth-State post-war reconstruction programs. This led to the formation of the Northern Australia Development Committee (N.A.D.C.), representative of the governments of the Commonwealth, Queensland, and Western Australia.

The N.A.D.C. was appointed in August 1945 and had its first formal

meeting in January 1946. It commanded investigational instrumentalities of the three governments concerned from which it assembled a great mass of preliminary information related to the pastoral potentialities of the Northern Territory, the Kimberleys, and Queensland's Channel, Gulf, and Peninsular regions. It was not given a formal commission as, for example, a Royal Commission, and could not compel sworn evidence from summoned witnesses.

Adequate planning and consultative machinery was provided, through which representations and recommendations involving government policies were made to a policy committee consisting of the Prime Minister, the Minister for the Interior, and the Premiers of Queensland and Western Australia.

The appointment of the N.A.D.C. constituted an effective endeavour to identify problems of development of pastoral resources in the remote regions in northern Australia, without rigid regard to the lines of State or Commonwealth territory boundaries. Numerous previous pastoral industry investigations by State authorities covering remote areas of Queensland, Western Australia, and the Northern Territory had been conducted, but the N.A.D.C. was the first body to consider the remote north as a whole, rather than in separate compartments. The composition of the committee and the scope of its terms of reference ensured that research and investigation resources of the governments concerned could be brought to bear in a study of the matters that came within its purview. Results related to agronomic and economic research, and provision of improved transport facilities that flowed from its recommendations, proved to be the most far-reaching in the history of northern Australia.

During its term as adviser, the N.A.D.C. made important observations and recommendations bearing on the development of pastoral resources of the Kimberleys, the Territory, and the Queensland Gulf, Peninsular and Channel regions. For example:

> The Committee affirms that, if the development of Northern Australia is to be tackled seriously, some permanent body with proper status and repre-

PLATE 1 *Mustering cattle on Katherine Research Station, N.T. (photograph by Australian News and Information Bureau)*

PLATE II *Santa Gertrudis breeding cattle, Queensland*
(photograph by Queensland Country Life)

PLATE III *Cattle on native pasture/Townsville stylo sequence trial*
(photograph by CSIRO Division of Land Research)

sentative of the Commonwealth, Queensland, and Western Australian Governments should be constituted to follow up the preliminary work already done by this Committee. Such a permanent body would become expert in the problems of the north, and would ensure the carrying out of the proper preliminary investigations, the correlation of all activities in the area, and the preparation of soundly-based long-range policies.[1]

In relation to the beef cattle industry, the aim of the N.A.D.C. was to assemble and study data from which problems of development could be identified and to indicate investigational and research procedures oriented to practicable solutions of problems related mainly to land and pasture utilisation, station structural and herd improvement, water resource development, credit, and transport. The movement of cattle over long distances was seen as a key problem of development.

In its report the committee made an important recommendation, under the heading 'Agriculture Under Irrigation', the results of which could, directly or indirectly, have beneficially affected the cattle industry. This recommendation read:

> That, as agriculture is of primary importance to the ultimate development of Northern Australia, experimental investigations into the growing of grain sorghums, pastures, cotton, tobacco, rice, ground nuts and other oil seeds, and other agricultural crops should be intensified. (p. 42.)

It can be seen that this was the most ambitious investigational project for an overall appreciation of the needs of development of the pastoral resources of the remote areas of northern Australia ever undertaken in nearly a century of occupancy of northern cattle lands.

The N.A.D.C. covered a broader field of investigation of the primary resources of the remote areas of the north than did any preceding investigational instrumentality. Particular studies related to the beef cattle industry which were recommended by the N.A.D.C. covered transport, water resources, capital investment in station structural improvement, land research and regional surveys, economic surveys, and credit requirements for development of resources.

INVESTIGATION OF THE BEEF INDUSTRY

In the post-war period, the Chifley government generated a great degree of vigour in its planning for the development of the Northern

[1] Commonwealth of Australia, Northern Australia Development Committee, 1947, Report on the Development of Northern Australia (unpublished).

Territory. Significant features were the implementation of N.A.D.C. recommendations for land research by the CSIRO in 1946 and for an economic survey of the beef cattle industry in northern Australia by the B.A.E. in 1948.

The CSIRO established the North Australia Regional Survey Unit in the Division of Plant Industry in 1946. It became an independent section — Land Research and Regional Survey Section — in 1950 and was given the status of a Division in 1956. Its name was changed to the Division of Land Research in 1966.

The first regional survey was carried out in the Katherine-Darwin Region (approximating Arnhem region) in 1946. Up to 1970, this Division has carried out and reported on twenty-eight surveys of regions and areas of Australia and the Territory of Papua and New Guinea. Fifteen reports in the CSIRO Land Research Series relate to beef cattle areas in northern Australia (see Bibliography).

A unit of the Division of Plant Industry, located at the Plant and Soils Laboratory, Brisbane, was given independent status as the Division of Tropical Pastures in 1959. Research and investigational work related to the beef industry covers mainly the brigalow, speargrass, wallum, and wet coastal regions of Queensland.

The B.A.E. was established as an independent and authoritative body to conduct continuous research into rural economic problems, to advise Commonwealth Departments and other organisations on financial and economic aspects of land use and agricultural policies and to provide primary producers with competent and impartial interpretations of the economic matters affecting their activities.

The tasks involved in the beef industry investigation were assigned to me by the foundation director of the B.A.E., Sir John Crawford, in an exacting directive of 22 April 1948, involving detailed particulars in respect of areas of cattle raising properties, estimate of stock normally carried, percentage of cattle handled, average numbers of fat or store stock forwarded to market or to fattening areas annually, effect of inadequate transport facilities on the age of stock at the time of marketing, estimate of annual losses on holdings due to disease and to inability to market, transport facilities to market and relative details of losses *en route* and loss of weight and quality, and probable effect of improved

transport facilities (including improved stock routes) as incentives to improve properties and increase annual turn-off.

The field work of the 1948 Territory survey began at Alice Springs (Centre region) in late April and ended in November. Ninety cattle stations were visited, representing about 85 per cent of the occupied cattle country.

The investigation revealed that heavy loss of beef was due to several factors, of which inadequate facilities for the movement of cattle was but one, and not necessarily the most critical. It was, therefore, essential to identify all of the factors contributing to beef loss, in order to indicate measures appropriate to avoid such loss.

The open range system in remote regions may have been justifiable in the early days of settlement, but in the light of a more buoyant outlook for beef production in 1948, continuance of the system could no longer be justified. Low rentals and inefficiently managed very large cattle stations encouraged exploitation of the limited native pasture resources, with the inevitable results of pasture denudation and soil erosion. Lack of fencing, inadequacy of stock watering facilities, and grossly incompetent management in many cases, resulted in deterioration in the quality of the herds through lack of culling and pollution by scrub bulls. It was obvious that continuance of the open range system must result in further lowering of the cattle-carrying capacity of the native pastures.

But it was also recognised that the open range system could not be abandoned without simultaneous action in other directions. If greater numbers of better quality cattle were to be carried, and the percentage of cattle turned-off substantially increased, improved facilities for the movement and marketing of cattle would have to be provided. This suggested that early consideration should be given to extension and modernisation of the existing meatworks at Wyndham to cope with increased beef production in the Territory and the Kimberleys, provision of an export meatworks at Darwin, improvement of wharfage and shipping facilities at Darwin, construction of a network of beef roads, improvement of existing rail transport facilities, extension of existing railways (e.g. Darwin-Birdum to Mount Isa or to Alice Springs), and improvement of stock routes.

The survey disclosed that Territory station structural improvements in 1948 consisted of approximately 740 'made' watering points (sub-artesian bores, wells, dams, etc.) — 3·4 points per 100 square miles; 6,000 miles of fencing — 4.2 miles per 100 square miles; wholly inadequate stockyard facilities; and, in most cases, substandard building for the accommodation of white employees, and almost nil for Aboriginal employees.

With the provision of these improvements and efficient utilisation of the native pasture resources, I estimated that within ten years of commencement of the suggested program the 1948 Territory cattle number of 1m. could be increased to 1.7m. and average annual turn-off (excluding Territory town and cattle station slaughterings) from 130,000 to 300,000.

As regards the effective utilisation of the remote region native pasture resources, my analysis of 1948 survey information indicated that 4,000 to 8,000 head, according to location, class of country, and purpose of production, could be efficiently managed.

Following the winding up of the N.A.D.C. in 1948, the Chifley government took two important steps. It initiated negotiations with the United Kingdom government for a long-term (fifteen-year) meat agreement, under which the United Kingdom would purchase specified proportions of Australia's exportable beef surplus, as a basis for beef industry development in northern Australia, and appointed a Cabinet subcommittee for the study of proposals relative to such development. The government also established a meat production development committee, consisting of senior government officials, to advise the Cabinet subcommittee on measures for increasing beef production in northern Australia.

From the outset of the negotiations with the United Kingdom, it was envisaged that the Australian government would use its best endeavours to encourage increased beef exports to the United Kingdom and to this end would promote development. This was ultimately written into the agreement, which came into force in July 1952, and terminated in September 1967. Promotion of development related mainly to development of the beef industry in northern Australia.[2]

[2] A.M.B., *Thirty-second Annual Report*, p. 133, 30 June 1967.

With special regard to the Northern Territory, the Cabinet subcommittee considered that with improved facilities for the movement of cattle, a meatworks at Darwin to provide an outlet for Victoria-Arnhem regions, and minimum station improvements supported by adequate credit facilities, Territory cattle numbers and turn-off could be substantially increased. It recognised that without these improvements, little increase in Territory cattle production could be expected. It also recognised that the open range system of grazing should be abandoned in favour of efficient management, based on adequate station structural improvements.

The Meat Production Development Committee accepted my view that a Territory cattle station development program to a minimum standard sufficient to obtain an increase in cattle numbers to 1·7m. and annual cattle turn-off to 302,500 would involve items of structural improvement and costs of the order shown in table 7.

Table 7
Cabinet subcommittee recommendations for Territory station improvements

		$A
Water supplies:	bore sinking	3,000,000
	equipment of bores	6,600,000
	ground tanks	400,000
Fencing		4,200,000
Yards		1,400,000
Buildings		1,000,000
Total		16,600,000

In 1950-1 the Menzies government passed up a golden opportunity to plan for the effective utilisation of the great bulk of the Territory's native pasture resources, in leaseholds in the Victoria, Barkly, and Arnhem-N.T. Gulf regions, due to expire in 1965. It also let pass an opportunity to create a Northern Territory Conservation and Development Authority, on lines suggested by the N.A.D.C., with adequate powers and funds, for the effective administration and development of the Territory.

Under further pressure of the N.T.P.L.A., the Menzies government abandoned its first (1950) Crown Lands Ordinance which, despite

some shortcomings, contained progressive features aimed at more effective utilisation of the Territory's pastoral resources.

THE COMMONWEALTH AND NORTHERN TERRITORY

In November 1960 the Commonwealth government appointed a Permanent Heads Committee (secretaries of various government departments) for the investigation of proposals under which the Commonwealth might be associated more closely with productive governmental projects in the outlying States (Queensland and Western Australia). The Committee took into account material to which I contributed relative to road development in relation to beef production and export in northern Australia.

In 1961 the Commonwealth government initiated a study of the feasibility of a beef roads construction program in the remote areas of northern Australia, and of the possibilities of a substantial increase in beef production, with a significantly greater beef industry contribution to Australia's export income. This study involved examination of beef roads proposals submitted by the governments of Queensland and Western Australia, and the Commonwealth Department of Territories (at that time responsible for the Northern Territory).

Arising from this study, my 1951 estimate of Territory native pasture cattle-carrying potential of 1·7m. was confirmed, but with average annual turn-off increased from 302,500 to 380,000 head, including Territory slaughterings for town and cattle station consumption, because of lower age and higher percentage of turn-off in Centre, Victoria, and Barkly regions. This was based on adequate structural improvement of cattle stations, the use of grazing resources for the most suitable purpose, effective occupancy of the land by resident holders of areas of efficient productive size, and adequate facilities for the movement of cattle from stations to market outlets. On these criteria, considering that the needed increase in cattle numbers would be only 54·5 per cent, I estimated that the cattle-carrying potential could be achieved in ten years.

But I expressed serious doubt, in sworn evidence, given at a hearing by the Commonwealth Parliamentary Committee on Public Works, in May 1963, regarding achievement of a potential native pasture

average annual turn-off of 380,000 head. This doubt was revealed in the following comment:

> The outlook for the three northern districts, under existing conditions of land holding, does not engender optimism regarding achievement of my estimated potential average turn-off of 265,000 head. The fact must be faced that this is not likely to be achieved under the present system of absentee land holding, in such large areas and aggregations, and that the development of the Territory's cattle industry will continue to be critically inhibited for as long as that system prevails.[3]

It is beyond doubt that in terms of public expenditure and governmental effort, far more has been expended in the Northern Territory in attempts to increase beef production than in any other remote region of the north (possibly more than in all other remote regions combined). From the outset of Commonwealth administration of the Territory the claim has been often repeated that only the big pastoral companies have the resources to develop the cattle industry. But the facts of history, particularly those relating to the record of production in the Centre region where the cattle stations are of moderate size and held by resident occupiers, have denied this claim as often as it has been made. The greater part of the beef potential of the Territory is in the control of wealthy absentee pastoral companies, where the land is held in areas far greater in size than in any other part of the world.

It is also beyond doubt that the cattle-carrying capacity, per square mile, of the native pastures of the Territory is lower in 1970 than it was in 1911.[4] Unless drastic measures are taken to halt pasture denudation and soil erosion, there will be little left of this resource by the end of the century.

The continuing grievous denudation of pastures could have been prevented by the Commonwealth government taking prompt legislative action along lines indicated by the N.A.D.C. Similar action had been

[3] Commonwealth of Australia, Parliamentary Standing Committee on Public Works, Minutes of Evidence, F.8062/63, p. 75.

[4] *Annual Reports on the Northern Territory* show that in 1911, 460,000 cattle were carried on 108,000 square miles of pastoral leases at four head to the square mile. In 1952, 1,017,000 were carried on 200,306 square miles at five to the square mile. In 1969, statistics showed 1,185,000 carried on 289,400 square miles at four to the square mile.

taken by the New South Wales government in respect of its semi-arid Western Division (two-fifths of the area of the State), this being manifestly in the public interest and, particularly, for the protection of this sector of the public estate.

Apart from the vigorous planning of the Fisher government of 1910-13, and that of the Chifley government of 1945-9, both having been frustrated by electoral defeats, no Commonwealth government has planned effectively for the development of the Northern Territory's pastoral and agricultural resources. Throughout the entire history of Commonwealth administration, no Administrator has publicly propounded such a plan.

The Territory has been aptly described as 'that enigmatic entity'.[5] Its history of subsequent failures has qualified it to retain the appellation. The development of its pastoral industry will continue to baffle Australian statesmanship, lacking measures essential to resolving the enigma. But it should not be beyond the wit and courage of statesmanship to enact and implement such measures.

There have been other official reports relative to land industry development in northern Australia (see Bibliography). The question might well be asked: why have they produced such fitful results?

Throughout the Territory's land settlement history the dominant plea of the big absentee leaseholders was that they lacked the security of tenure to warrant heavy investment in station structural, pasture, and herd improvement. That plea was fully acknowledged by the Commonwealth with the enactment of the 1953 and 1967 Crown Lands Ordinances which provide, *inter alia*, the 'rolling' fifty-year lease. Section 48 (1) of the Crown Lands Ordinance (No. 2) of 1967 provides that

> The lessee under a pastoral lease may, at any time between the commencement of the twentieth and the expiration of the fortieth year of the lease, apply in writing to the Administrator for permission to surrender the lease in exchange for a new pastoral lease of the whole or a specified part of the land included in the existing lease.

After consideration of the application by a Land Board, the Adminis-

[5] *C.P.P.*, No. 4 of 1937, p. 5.

trator may, with the consent of the Minister, notify the applicant 'of the term, not exceeding fifty years, for which the Minister is prepared to grant a new pastoral lease'. In the Territory, this is commonly referred to as a 'rolling' or 'rollover' lease.

The Commonwealth government could have, in the light of nearly a century of largely unproductive (in some places destructive) use of the cattle lands of the Arnhem-Victoria-N.T. Gulf-Barkly regions, exercised its right of resumption, due in the mid-1940s, of a substantial proportion of the absentee held lands, and have allowed the remainder of the leases to run on to expiry in 1965. Thus, it would have been in a position, at little cost, to establish on perpetual leaseholds of efficient productive size, resident occupiers who would, by now, have been well on the way to achievement of the Territory's beef potential. It could have exercised its right, under the conditions of the new leases granted in 1924, to resumption in the 1940s of a proportion of the leaseholds due to expire in 1965, and proceeded with effective settlement of the resumed lands.

Instead, the government has, by granting extension of pastoral leases to the year 2004, with provision for further extension, critically inhibited achievement of the Territory beef potential by perpetuating the evil of ineffective absentee holding of the greater part of the cattle lands.

The full development of the land, marine, and mineral resources of the Territory can be achieved through imaginative and vigorous planning, and sound administration of Territory affairs. Viewing the Territory and its numerous failures in retrospect, it is my considered opinion that such development can be achieved by abandonment of the present ineffective system of administration and the substitution of control by a Northern Territory Conservation and Development Corporation, with an adequate charter and ample powers and funds for its purposes. Development of the beef potentialities alone would justify creation of such a corporation.

5

LAND UTILISATION

A CENTURY of beef cattle raising in northern Australia shows that, with very few exceptions, the most efficient production has been achieved on well improved holdings carrying herds of effectively manageable size, operated by capable resident occupiers. This holds true irrespective of whether it is in relation to areas of high beef production potentiality, in inside regions, or of low potentiality in remote regions.

The merits of resident versus absentee landholding, in all parts of Australia, have been vigorously argued at varying periods of land settlement activity throughout this century. The trend has been towards closer land settlement, with most authorities affirming its national advantages.

But governmental instrumentalities concerned with closer settlement have frequently erred on the side of land subdivision into farm holdings of uneconomic size. Such errors led to the failure of many farmers, including World War I soldier settlers.

Following the post-war boom of the 1920s there were many such failures, particularly in the depression period of low prices of farm products in the early 1930s, when many dryland and irrigation farmers were forced into bankruptcy. In some cases, these errors were repeated under the World War II service land settlement scheme in the late

1940s and the 1950s. The peasant-holding concept seemingly remained in some minds even then.

THE 'LIVING AREA' CONCEPT

Closer settlement farm size was generally based on the family farm, 'living area' concept, which lacked precise definition in economic terms. The only attempt at such definition was that which related to the 'home maintenance area' concept, inserted in the New South Wales Crown Lands Consolidation Act of 1913:

> an area which, when used for the purpose for which it is reasonably fitted, would be sufficient for maintenance in average seasons and circumstances of an average family.[1]

Questions of what constituted a home maintenance area and the basis on which it was determined were put to a critical test, in 1926, in respect of an irrigation farm holding on the Murrumbidgee Irrigation Area, which was the subject of an appeal to the Land and Valuation Court of New South Wales, against a determination of the Water Conservation and Irrigation Commission of New South Wales, as to the basis on which it assessed the adequacy of a particular home maintenance area. (The method used by the commission included an allowance of £A208 per year as the wage of the farm holder — the equivalent of the 1926 basic wage.)

The appellant's case was that a home maintenance area should be such as would provide a home maintenance income of about £A500 per year, including £A312 as a reasonable labour income for the farm (approximately $A4,000 and $A2,500 in present money value). In upholding the appeal, the judge considered that the allowance for a farmer's wage should not be less than £A312 per year, and that a property showing a return (after paying working outgoings) of somewhat over £A500 per annum would constitute a home maintenance area.

It is of interest, in retrospect, to note that the basis on which this particular home maintenance income was arrived at was an average of farm prices over the previous five years (1921-5). The subsequent calamitous fall in farm product prices, in the depression years of the

[1] New South Wales, Crown Lands Consolidation Act, 1913. See also *Report of the Water Conservation and Irrigation Commission for the Year ended 30th June, 1927*, Appendix I, pp. 60-3.

1930s, completely negatived this judgment. Consequently, the questions had to be determined afresh in this, as well as thousands of other instances, at very heavy cost to both the farmers and Australia.

The fallacy of the home maintenance and living area concepts should have been apparent to all concerned with land settlement, with a salutary warning against repetition in future closer settlement schemes. This has particular relevance to considerations of effective land occupancy in remote northern cattle regions.

THE POSSIBILITIES OF IMPROVEMENT

Table 8 depicts the wide scope of the pasture improvement potential of the remote regions of northern Australia and the magnitude of the private investment involved in its development. It also provides an appreciation of the growth-cost factor of a ninefold increase in 1969 cattle numbers:

Table 8
Growth and cost factors of remote region pasture improvement potential

Region	Cattle		Pasture improvable	Fencing	Yards and dips	Water points	Seed and fertiliser	Total
	Present number '000 head	Potential number m. head	sq. m.	$Am.	$Am.	$Am.	$Am.	$Am.
Kimberley	30	0·4	4,687	2·8	1·6	2·8	10·8	18·0
Arnhem-Victoria-N.T. Gulf	300	4·2	39,062	29·0	16·6	29·0	112·0	186·0
Peninsular	320	2·0	18,750	14·0	8·0	14·0	54·0	90·0
Qld Gulf	200	1·2	10,937	8·4	4·8	8·4	32·4	54·0
Total	850	7·8	73,436	54·2	31·0	54·2	209·2	348·6

Ignoring income tax concessions granted by the Commonwealth government to farmers and graziers in respect of seed, fertiliser, and other costs incurred in progressive development of the nature here envisaged, the beast-area cost of the items shown in table 8 would average approximately $A45 (low by southern Australian standards). The rate of pasture improvement development would be governed by the rate of herd growth of approximately 30 years. (The rate of pasture

development must be carefully judged, lest the availability of feed outstrip the availability of sufficient numbers of cattle to consume it.) Thus, the annual *total* expenditure called for would average $A11·6m. Assuming that progressive production increase would yield continuous taxable returns, and that high cost seed and fertiliser, structural and land improvement items would qualify for tax rebate, the average beast-area structural improvement cost would be as low as $A16.30. The overall annual structural improvement expenditure would thus average $A4·68m. The comparison points up the generous nature of the tax incentive offered in pasture improvement.

Even with willingness on the part of the big absentee holders to undertake programs aimed at full development of the pasture improvement potentiality of remote region lands under their control, their ability to achieve this, because of limitations on efficient management of very large herds, is open to doubt. In inside Queensland areas of high cattle density, few herds reach 10,000 head. In New South Wales, where present beef cattle numbers equal the total of the remote regions of the north, to my knowledge only two individual herds exceed 5,000 head; in Victoria, where present beef cattle numbers substantially exceed those of the Northern Territory, no herd runs to five figures and few exceed 2,000 head.

In my opinion, the upper limit for an efficient productive unit in remote region pasture improvable areas is the capitalisation of a unit of this size, including the value of 10,000 cattle, of the order of $A964,000. A 20 per cent annual turn-off of 2,000 head, at an average on-station price of $A100, would yield $A200,000. Assuming annual average total operating expenses at 50 per cent of the on-station return, the surplus would provide an earning rate of 10 per cent on the total capitalisation. Taking into account the tax deductibility of high cost items in progressive improved pasture establishment, the beast-area cost of pasture establishment would fall by at least half; the rate of return on a lower capitalisation (approximately $A767,000) would be of the order of 13 per cent.

A pastoral holding that would carry 10,000 head of cattle on 94 square miles of improved pasture plus, say, 406 square miles of native pasture, in a remote region of northern Australia would be of a

dimension that would fully tax the managerial capabilities of a highly skilled owner operator, with the advantage of unfettered administration of his own financial resources and the ability to make on-the-spot decisions.

It is doubtful if the necessary levels of private investment and standards of station management efficiency essential to full development of remote region cattle raising resources are likely to be reached under prevailing conditions of remote region land occupancy and utilisation, especially in the Northern Territory and the Kimberleys. Where governmental insistence on productive and protective utilisation of the grazing resources is inadequate, it seems unlikely.

In 1962 the government of Western Australia appointed a Pastoral Leases Committee to inquire into and report upon 'the past, present and future use, treatment and effective occupation of the areas comprised in existing pastoral leases and potential pastoral areas of the state'.[2] The committee recommended, among other things, that the lessee whose lease expires in 2015 may apply to have it extended, that not less than two-and-a-half times the rent be spent annually by the lessee on improvements, and that the lease may be cancelled in whole or in part if the Minister considers that the land has been allowed to deteriorate.

The substance of these recommendations was incorporated in the amended Western Australia Land Act of 1963.

If the annual rental of Kimberley stations, over the fifty-year period of the new lease, averaged $A1.40 per square mile, and the number of cattle carried averaged an attainable 10 per square mile (both substantially higher than the present average), the additional expenditure on station improvements, under the amended Land Act, would average approximately $A7 per beast-area, compared with my estimated minimum requirement of $A23 necessary to reach a capacity of 10 beasts per square mile. Thus, the legally enforceable minimum must be held inadequate.

In the Northern Territory, the Crown Lands Ordinance does not specify the nature of, nor the actual expenditure on station improve-

[2] Western Australia, *Report of the Pastoral Leases Committee*, pp. 131-3, Govt Printer, Perth, 1963.

ment as conditions of the lease. These are at the discretion of the Minister for the Interior on the recommendation of the Administrator of the Northern Territory. An indication of the attitude of the Commonwealth to the future development of the cattle industry in the Territory was given in a notification setting apart for settlement three blocks resumed from Alexandria Station (formerly of 11,262 square miles).[3]

The best of the three was Mount Drummond, in Barkly region, of 1,127 square miles situated 65 miles north-west of Camooweal (15-inch average annual rainfall), with a stated carrying capacity of 'about 6,000 cattle' (8,000-10,000 would be more realistic). The existing improvements consisted of two sub-artesian bores and three yards, of a total value of $A11,550. The minimum stocking condition was three head to the square mile (one beast to 213 acres) in ten years and thereafter. Minimum improvement requirements included: buildings, $A8,000; watering points (additional to existing), three in ten years; fencing, 50 miles in ten years; drafting yard with dip or spray, one in five years. The total cost would approximate $A70,000. The stocking condition was substantially less than half the true carrying capacity. Performance of the structural improvement conditions would cost $A8 per beast-area, compared with my estimate of a minimum of $A37.

LAND POLICY IN QUEENSLAND

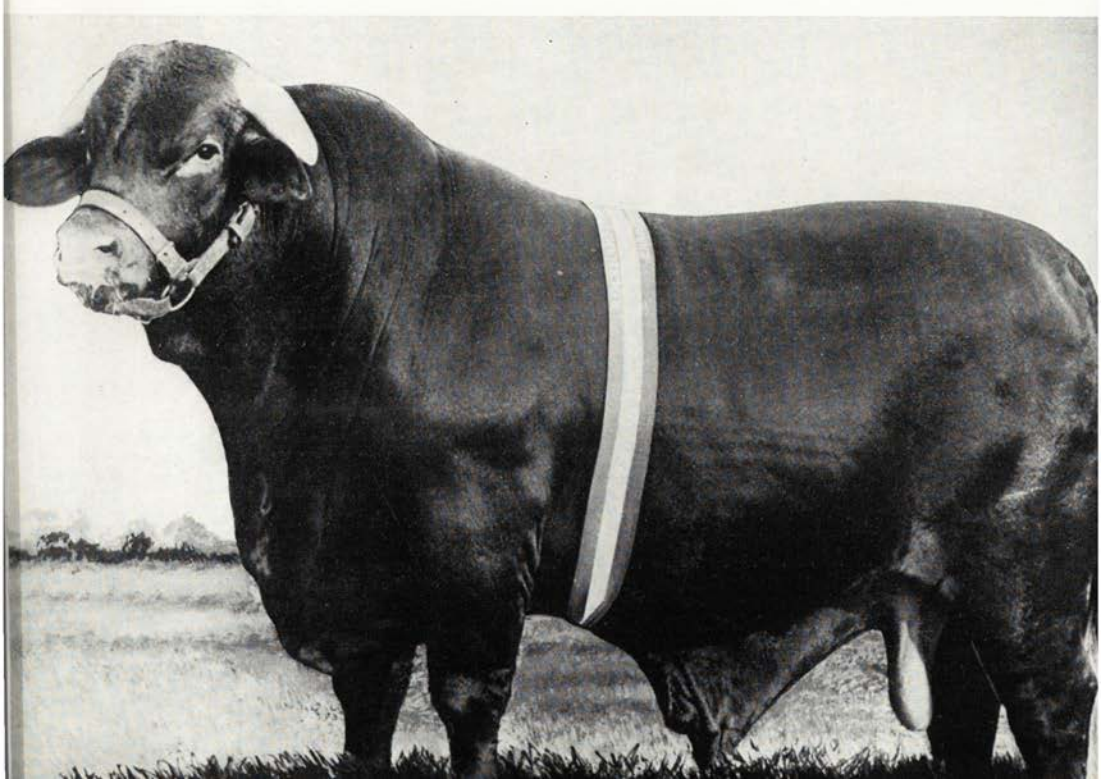
In contrast, the Queensland government's attitude to the future development of the State's remote regions was indicated in March 1967, when it invited applications for two blocks, McAllister, of 234 square miles, and Warren Vale, of 193 square miles, 60-70 miles south-west of Normanton, in an average annual rainfall area of 27 inches, with native pasture carrying capacities of 3,500-4,000 head of cattle. (Both blocks have pasture improvement capability.)

The existing improvements on the Warren Vale block totalled a provisional value of $A48,000 — approximately $A12 per beast-area. The notification stated that 'by the provision of three further waters, subdivisional fencing, the completion of boundary fencing, the erection

[3] Commonwealth of Australia, *Northern Territory Government Gazette*, No. 17, 29 March 1966.

PLATE IV *Champion Brahman stud bull, Queensland*
(*photograph by Queensland* Country Life)

PLATE V *Champion Santa Gertrudis stud bull, Queensland*
(*photograph by Queensland* Country Life)



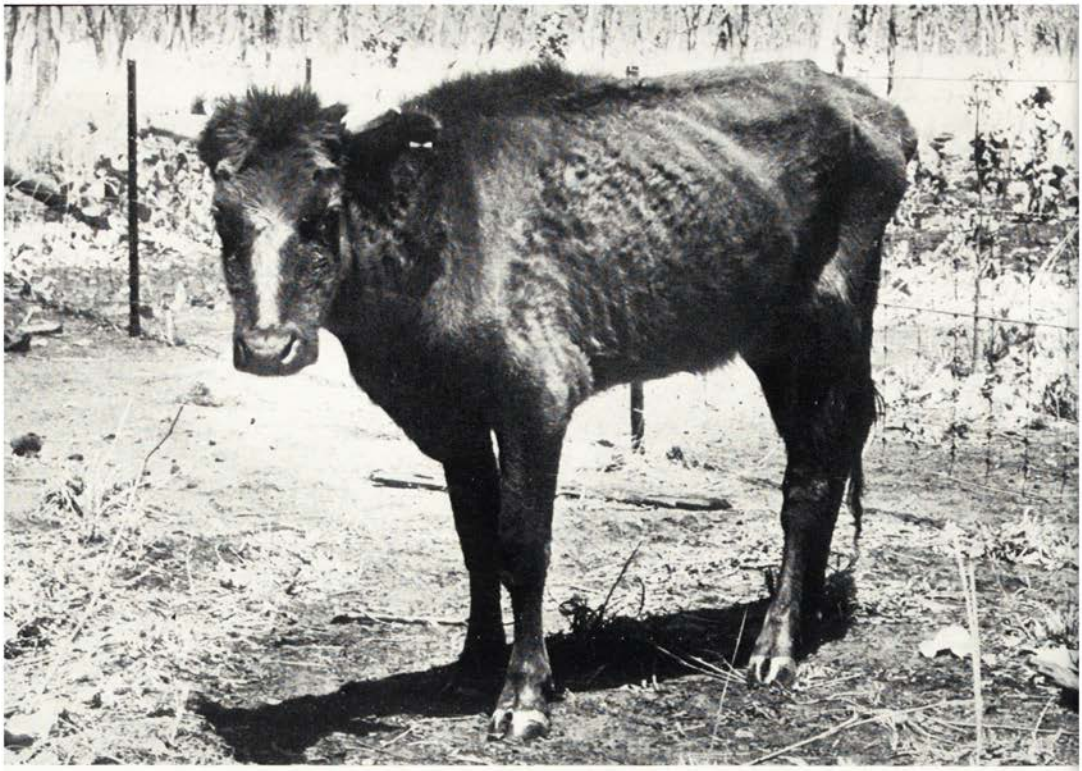


PLATE VI *Cow removed from native pasture, late dry season (photograph by CSIRO Division of Land Research)*

PLATE VII *Two beasts, of same age and treatment in first year, left beast grazed on sown pastures in second year, right beast on native pastures (photograph by CSIRO Division of Land Research)*

of further yards and establishment of improved pastures in the forest areas, the carrying capacity can be economically increased'.

Applicants were required to submit:

> A programme for development of the area with a plan in illustration, including the estimated time for the completion of such development, which must ensure that the area is reasonably watered and provide for adequate boundary and subdivisional fencing.
>
> Developmental conditions based on the offer by the successful applicant to be included in the lease of the Pastoral Holding will be issued over the land.
>
> The number and breed of cattle it is proposed to graze on the land when developed together with the expected source from which the stock will be acquired.
>
> The estimate of the expenditure that is likely to be incurred by the applicant in fulfilment of his proposals.[4]

Tenure was for a lease as a pastoral development holding, for a term of 30 years. Annual rent for Warren Vale was $A5.50 per square mile for the first ten years — approximately 27 cents per beast-area at 20 head to the square mile — with rentals for the second and third ten years to be determined by the Land Court. No resumption would be made during the first twenty years; thereafter, one-third might be resumed under provisions of the Land Acts. The successful applicant might be required to enter into a bond to ensure the completion of the development works.

It is clear that the operation of the Queensland system promises more vigorous development of its remote region sector of the public estate than does that of the other governments.

It has long been the practice of the Queensland government periodically to appoint either a Royal Commission or a special committee to study particular aspects of land occupancy and utilisation for guidance in its administration of the public estate. There have been three such investigations: the Royal Commission on Abattoirs and Meatworks, 1945; the Royal Commission on Pastoral Lands Settlement (Queensland), 1951; the Land Settlement Advisory Commission (Sir William Payne), 1959.

[4] Queensland Department of Lands, 15 March 1967. Invitation of applications for lease of McAllister, 234 square miles, Warren Vale, 193 square miles. Normanton Land Agent's District.

The 1951 commission made the following references to the subdivision of cattle lands:

> Broadly speaking, we favour in respect of the cattle lands of the State a policy of subdivision. We feel that there is now sufficient confidence in the industry and enough capital available to achieve this and that it would lead to increased production.
>
> We do not believe that large areas of land held cheaply are conducive to production. The experience of history is that any commodity — inclusive of land — becomes the subject of waste and abuse if in too cheap and plentiful supply.
>
> We would recommend that, in future, areas to be worked as one property be limited in size — where this is practicable — to sufficient country to run comfortably, a mixed herd of 10,000 cattle in the northern parts of the State and 6,000 in the western districts thereof.
>
> We would define a living area as one to carry 750 head of mixed cattle in the south-east of the State and rising to a maximum of 2,500 head in the northern and western divisions thereof where subdivision is still practicable.
>
> Here again we recommend a limitation in land use as distinct from ownership, and suggest that the maximum area permissible in the case of a new pastoral lease be limited to the equivalent of three living area units for the locality.[5]

The 1959 commission referred to the advantages of closer settlement in the following terms:

> Sound closer settlement, of course, should be the constant aim of land administration. And what does closer settlement imply? It implies the division of the land in economically sound areas amongst its people so that it may be worked prudently and intensively and developed to the utmost; used for the greatest production of which it is capable; and cared for, protected, and preserved so that it may remain a storehouse of wealth for future generations.
>
> The interests of citizens yet unborn are to be protected as much as our own . . .

On the subject of tax concessions the commission observed:

> There are big rewards awaiting any enterprising man who will develop the lands of Queensland. These are greatly enhanced by the incidence of taxation. Before arriving at net taxable income, deductions of expenditure incurred in the year of income are allowed on scrub clearing and timber

[5] Queensland, *Report of the Royal Commission on Pastoral Lands Settlement in Queensland*, pp. 12-13, Govt Printer, Brisbane, 1951.

treatment, on the construction of water improvements of all kinds, on the preparation of land for agriculture, on ploughing and grassing for grazing purposes, and for similar improvements . . .

Big men pay the maximum rate of taxation on their income, namely, 13s. 4d. in the £ [66 cents in the $] . . . costs of development (other than structural improvements) are deductible from gross income before net taxable income is arrived at. This means that the community subsidises land development to the extent of 13s. 4d. in the £. But when development has been done, it belongs solely to the lessee and increases the asset value of his property. In effect, the enterprising grazier gets a profit, saves himself taxation, increases the asset value of his property, and has his development work handsomely subsidised by the community.

Thus, as never before, it is worth while for the big man and the big companies to develop difficult country and reap a rich reward . . .

The conclusion is inescapable. Closer settlement, wherever reasonably possible, is in the best interests of the State. But we must not attempt to go too far too fast. Each new subdivision must be an economic proposition, giving the settler a reasonable chance of success.[6]

The findings of the 1951 and 1959 commissions fully justified the broad public estate administration policies long followed by Queensland governments, irrespective of their political party affiliations, particularly in resistance to pressures for longer-term leases and large-scale freehold tenure in the remote regions. The principle of fixed term leasehold (mostly of the order of thirty years duration) applicable to large area pastoral holdings, with reservations as to State right of resumption, was established by Liberal governments in the last century and has since been adhered to by both Country-Liberal and Labor governments.

The more vigorous closer settlement activity has occurred within the latitudinal and longitudinal limits suggested by the 1951 commission. But at no time has a Queensland government entertained a land tenure measure which would critically inhibit its flexibility in remote region public estate administration.

OVERSEAS INVESTMENT

In 1965 several United States investors became interested in the acquisition of large areas of cattle country in northern Australia. Eleven

[6] The Land Settlement Advisory Commission, *Report on Progressive Land Settlement in Queensland*, pp. 5, 6, 19, Govt Printer, Brisbane, 1959.

Queensland cattle station leaseholds in Peninsular region, to the north of the Mitchell River, aggregating approximately 9,000 square miles, were purchased by United States individuals and groups.

In the early 1960s, Tipperary Station of 3,560 square miles, held under fifty-year Northern Territory leasehold tenure to the year 2010 at a moderate annual rental of 60 cents per square mile for the first ten-year period, with a native pasture cattle-carrying capacity which I estimated at 22,600 head, was purchased by a group registered as the Tipperary Pastoral Company. The list of shareholders consisted of a consortium of Singapore, Hong Kong, and Kuala Lumpur investors.

According to a memorandum of 9 February 1967, of the Lakefield Company of Midland, Texas, setting forth its objectives, the Tipperary Land Corporation was formed in the United States. The founders were a group of holders of Peninsular properties purchased in 1965. An equity interest was allotted to Sir William Gunn, who became managing director of the corporation, the remainder of the shares being held by the United States investors. The *Sunday Mail*, Brisbane, of 2 June 1968 reported that Tipperary Station was purchased for a reported price of $A1·501m. It was merged with the Peninsular properties in the Tipperary Land Corporation.

The Lakefield Company was a corporation organised under the laws of the State of Texas, qualified to do business in Australia. The organisers of the company were the partners who comprised the Lakefield Company, a Texas limited partnership. The partnership held Lakefield, Laura, and Silver Plains Stations, in Peninsular region, which were (and still are) operated as cattle stations. The partners invested $US1·5m. in the acquisition and improvement of these stations which were subsequently contributed to the Tipperary Land and Exploration Corporation in exchange for its stock.

During 1966 Sir William Gunn had unsuccessfully endeavoured to obtain better tenure of the Peninsular properties from the Queensland government. Successive Queensland governments have resisted pressures for longer and more secure tenures, and even freehold, of large cattle stations. Queensland's administration of its part of the public estate has always been oriented towards eventual closer settlement. Leasehold tenure of large cattle stations has usually been of thirty-year term, with

prescribed improvement conditions, and firm reservations regarding resumption. No Queensland government has ever evinced willingness to depart from this philosophy, despite many pressures exerted by major pastoral interests.

During the 1966 Queensland election campaign the then Premier, Sir Frank Nicklin, said:

> We have repeatedly rejected arguments advanced in favour of big company development. While we do not deny that large-scale land development by big private capital would have certain economic advantages, we are also convinced that immediate closer settlement best serves the interests of this State and the nation.[7]

Sir William Gunn believed the possibilities of obtaining a still better title than the existing fifty-year lease, and even freehold tenure in respect of Northern Territory cattle properties, were more encouraging. His belief was fully confirmed with the 'rolling lease' provision of Crown Lands Ordinance No. 2 of 1967.[8]

The Lakefield Company outlined a proposal which involved, *inter alia:* formation of the Tipperary Land Corporation, to which the Lakefield Co. would be contributed in return for stock in the Tipperary Corporation; the purchase of Tipperary Station, of 3,560 square miles, in the Northern Territory; continuance of the operation of Tipperary as a cattle station on all areas which were not suitable for intensive agriculture; cultivation of areas suitable for cropping, beginning with 19 square miles in the first crop season (1967-8), expanding to a maximum of 312 square miles in the fifth crop season.

The company proposed that the Tipperary lease be reformed to include a provision that the power of resumption be exercisable only in the event the company failed to discharge its development obligations or was otherwise in default, and that the term of the lease be fifty years, with privileges for renewal for an additional term or terms.

The initial 1965-6 rate of investment by the Tipperary Corporation in structural and pasture improvement of their Peninsular cattle properties

[7] *Financial Review*, 24 Oct. 1967.

[8] National Council for Balanced Development, Regional Conference, Cairns, Qld, 1 Sept. 1967. Sir William Gunn, 'New Dimensions in Public Pastoral Company Management', p. 13.

was not sustained in the 1967-9 period, nor is there evidence of substantial increase in cattle numbers. The decrease in overall Peninsular cattle numbers over the 1965-9 period as shown by the Bureau of Census and Statistics' figures for Cook Shire was from 99,794 to 95,100. Whether the drop in the initial vigorous development program was due to the fact that the Queensland government declined to alter the land tenure has not been made public. However, with reasonably efficient station management and administration, the rate of return on the Corporation's investment in the Peninsular properties, on the basis of native pasture, alone, will still be adequate.

With regard to other and larger investments in both inside and remote region Queensland cattle properties, the investors do not seem to hold Queensland's leasehold tenures in such disfavour as do the American investors. Experience has shown that where existing holders' investments in property improvements have been substantial and production has increased, the State authorities have not been ungenerous in the matter of lease renewal.

CROWN LANDS ORDINANCES

In October 1966 the Minister for Territories had indicated that significant departures from land occupancy and utilisation under existing Crown Lands Ordinances were in contemplation:

> One field in which we are at a disadvantage in the Northern Territory is that of land laws. The land ordinances are completely out of date. They have been amended and added to and so on, and they are completely inflexible. Soon after I became Minister and had to make decisions on matters of leases I became aware of this and realised that we must have a completely new set of land Ordinances. I have had a study group working on this for the last two years and I hope to bring something forward soon and to present it to the Northern Territory Legislative Council. . . .[9]

The Minister also circulated a memorandum to members of Parliament in March 1967, in which he outlined views on Territory land tenure proposals. In summary, the proposals were:

> Pastoral Leases
> Maximum term of fifty years to be retained but lessees to have no preference at the end of term.

[9] *C.P.D.*, Vol. 53, H. of R., p. 1680, 12 Oct. 1966.

It is to be open to lessees to apply to the Administrator to convert to a new lease at any time between the twentieth and fortieth years of their leases.
Where a new lease is to be negotiated and the extent to which further development is justifiable, the area of the lease, lease rentals and other relevant factors will be taken into account.
Agricultural production is to be permitted on pastoral leases — lessee to notify annually the extent of commercial agricultural production.
The provision authorising resumption of land for cultivation purposes from a lease to be removed.
Rental for land used for agricultural production to be reappraised at the next reappraisement date on the basis of agricultural lands.
Lessees to be permitted, subject to approval, to subdivide developed arable lands into economically viable agricultural leases.
Agricultural Leases
The maximum area for agricultural leases to be increased from 38,400 acres to 100,000 acres but not more than 200,000 acres to be held in total by the one interest.
All agricultural leases to be capable of conversion to freehold in the same way as agricultural leases held by individuals may at present be converted.[10]

A Bill for a new Crown Lands Ordinance to give effect to the proposals was introduced in the Territory Legislative Council in May 1967. According to the *Australian* (17 May 1967), Mr R. Ward, a Darwin solicitor and member of the Legislative Council, stated on 16 May that:

> the new legislation would equal any land scandal which had ever happened in Australia . . . Under the proposed legislation, pastoralists would be able to obtain freehold properties of 300 square miles and do what they liked with them . . . Pastoralists would either hold the freehold themselves or exploit it by subdividing on their own terms to small farmers . . . The six Government official members would be instructed to vote for it.

In the same issue of the *Australian*, Sir William Gunn was reported to have said:

> the company would give first preference in subdivisions to employees and then to other Australians.
>
> The company would help a man to become a share-farmer until he had paid for his equipment. He could then buy a block of land.
>
> The station had 150 employees and would take on another 50 in the next

[10] See also *C.P.D.*, Vol. 54, H. of R., p. 382, 7 March 1967.

12 months. Half were Aboriginals, who would have equal rights to assistance in setting up farms . . .

How does a young man get on the land today if he has no money? Here's a way they can get in. If this project succeeds it will lead to a revolution in development of the top end of the Territory . . .

Rejection of the legislation would set the company's project back several years. . . .

Like others which preceded it, this Bill was bitterly contested by elected members and, to a lesser extent, by two or three government nominated, non-official members. At that time, the Legislative Council (established under the Northern Territory Administration Act of 1947) consisted of eight elected members, three appointed non-official members, and six appointed official members. The official members comprised two assistant Administrators, and the Directors of Social Welfare, Mines, and Lands Branches, and the Crown Law Officer.

Four Bills for major Crown Lands Ordinances since the inauguration of the Territory Legislative Council — 1948, 1950, 1953, 1967 — were passed despite opposition by elected members.[11] None originated in the Council. All were government measures. The first two never became the law. The last two strongly favoured the vested interests of the overseas pastoral companies. It should never be overlooked that these measures dealt with public, not private lands.

The 1967 Bill, which was contested clause by clause by the elected members, became Crown Lands Ordinance No. 2 of 1967. Its most important features were that it repealed Division 2A of Crown Lands Ordinance 1931-65, which provided for pastoral homestead (perpetual) leases; provided for the 'rolling' pastoral lease; provided the opportunity for individual or company holders of pastoral leases to convert to freehold up to 312 square miles of arable land; and permitted the private subdivision and sale of freehold arable lands.

[11] Northern Territory of Australia, Crown Lands Ordinances, notified in *Commonwealth Gazette*, No. 2, 9 March 1949; No. 4, 15 Apr. 1953; No. 2, 8 Sept. 1967. A Crown Lands Amendment Bill was passed by the Legislative Council as Ordinance No. 2 of 1950. In March 1951, the N.T.P.L.A. submitted to the Department of the Interior a statement of reasons why Ordinance No. 2 of 1950 should not be recommended to the Governor General for his assent. The Ordinance was not assented to and did not become the law.

In my opinion the pastoral homestead lease title (provided by Crown Lands Ordinance No. 4 of 1953) was the most progressive measure ever enacted for effective land occupancy and development in the Territory. It enabled an individual to hold, or two or more individuals as joint tenants to hold as a pastoral homestead lease (subject to a firm condition of residence and a condition that the lessee held no beneficial interest in any other Territory pastoral land) an area not substantially in excess of a 'minimum economic area', defined in herd size terms.

The 'rolling' lease provides that the Administrator of the Territory may, with the consent of the Minister, grant a new fifty-year lease of an existing fifty-year leasehold every twenty years, so that the lease can go on for ever.

The right to convert as much as 312 square miles of arable Crown land to freehold is unprecedented in northern Australia. The right to subdivide freehold arable lands for private sale amounts, in these circumstances, to an abdication of governmental responsibility for the effective settlement of an important sector of the public estate for which it is the sole trustee.

6

BEEF POTENTIAL

To assess the beef potential of northern Australia one must establish the technological feasibility of cattle-carrying capacity. The problem then is to determine the economically feasible, in the light of current relationships between cattle prices, net returns, and costs of development. This leads to other crucial questions. What is meant by economic feasibility? Under what conditions does a potential which is technically feasible become economically feasible? Answers to these questions in turn involve consideration of critical factors of development and factors governing growth.

In 1961 I revised my 1952 estimate of potential cattle numbers and turn-off in northern Australia for the purpose of economic evaluation by Commonwealth authorities, in the 1961-4 period, of beef road construction proposals submitted to the Commonwealth by the governments of Western Australia and Queensland and the Northern Territory Administration. This was based on a major field survey of northern beef cattle regions made in 1960.

The purpose of this survey was to make a fresh appreciation of the incidence of cattle lands occupancy; needed additional station structural improvements; cattle herd improvement; native pasture management; pasture improvement; water resource development; cattle transport;

station labour requirements (at optimum development); lands administration; the cattle potential.

I drew the following broad conclusions:

1. Approximately 68 per cent of the cattle potential of the remote regions was held by absentee landholders.
2. More than half of the cattle country in the remote regions was under-developed and badly managed.
3. Development of the beef potential could best be achieved by occupancy of the cattle lands by resident holders in units of efficient productive size.
4. Whilst prospects of pasture improvement in remote regions were encouraging in areas of above 30-inch average annual rainfall, there was insufficient evidence (at that time) to warrant quantitative estimates of increased beef production from this resource.
5. Effective solution of the cattle transport problem in the remote regions involved the construction of 620 miles of new railway, from Larrimah via the Barkly Tableland to Mount Isa, and reconstruction of the 300-mile Darwin-Larrimah railway and a network of 8,700 miles of sealed surface beef roads to facilitate the movement of cattle from property to railhead, shipping facility, fattening area, or slaughtering point.
6. At optimum development, cattle station labour requirements would average one employed person to 600 head of cattle carried.
7. Native pasture depletion and soil erosion resulting from overgrazing due to neglect, bad pasture management, and lack of adequate soil and pasture protection provisions in Crown land leases as a condition of occupancy of cattle lands, had seriously impaired productivity in some regions.
8. The previously estimated cattle potential could be revised upwards, on the basis of: effective land occupancy in units of efficient productive size; more intensive station structural improvement; better pasture and herd management; better all round animal husbandry, leading to earlier maturity of marketable cattle, a greater pro-

portionate recovery of cow beef and a higher percentage of herd turned-off.

My estimated potential cattle number of 5·1m., and annual turn-off of 1·3m. head in remote regions was qualified as follows:

The estimate of the beef potential of the remote regions was based mainly on utilisation of native pasture resources. Much pasture research had been carried on, in the 1946-60 period, by the CSIRO, Western Australian and Queensland Departments of Agriculture and Primary Industries, and the Northern Territory Administration. Although the research results were promising in areas of more than 25-inch average annual rainfall, the extent of translation into economic farm-scale reality in Kimberley, Arnhem-N.T. Gulf, and Qld Gulf-Peninsular regions was insufficient, at that time, to justify taking into account possibilities of greater production from pasture improvement.[1]

I carried out a further comprehensive study of northern Australia's beef economy in 1967-70. This combined a review of previously recorded material with field studies of all northern beef cattle regions, in closer detail than anything of the kind previously attempted. The aim of the study was to make an up-to-1970 appreciation of the beef potential of northern Australia in the light of results of continuing research and experiment in pasture improvement and agricultural aids, related to the beef industry; to estimate the costs of its development in private investment terms; and to re-examine factors of beef production and marketing previously identified.

Over the 1964-7 period, northern pastoral industry research and experiment results, plus development in Queensland wallum, brigalow, and northern wet coast areas, revealed the need for a fresh delineation

[1] M. J. T. Norman, CSIRO Division of Land Research, 'Townsville Stylo in Northern Australia'. Address to the bi-annual meeting of the CSIRO Advisory Council, 15 Nov. 1967, p. 13: 'Although under experimental conditions, both in the Territory and Queensland, cattle have been carried at 3 acres/beast year-round on Townsville stylo, the sort of figure which has become generally accepted in the north by scientists and development planners for commercial operation is 5 acres/beast year-round. This would mean at least 12,000,000 cattle. The *total* beef cattle population of Australia at present is only about 15 million'. See also *Financial Review*, 16 Nov. 1969: 'Townsville Lucerne Key to 60m. Acres of Beef Land'.

of cattle regions and a regional reassessment of the cattle potential in the light of recent advances made in pasture improvement technology.

Assessment of the beef potential, particularly in respect of the remote regions with pasture improvement capability, must necessarily be based largely on judgment in the absence of large-scale translation to economic farm-scale practice of results of pasture research and experiment.

Technological feasibility in terms of cattle-carrying and turn-off capacities is broadly defined as embracing:

1. The effective utilisation of native pastures, aimed at conservation of grasses and herbage, edible shrubs and trees (topfeed) and the prevention of soil erosion. The essentials of this aim are the securing of boundary fences to prevent the straying of cattle into or from the holding; sufficient subdivisional fencing to enable cattle to be segregated according to age, sex, and type; sufficient permanent watering points to enable cattle to graze evenly within an appropriate radius of a watering point.
2. Rotational relief from grazing to ensure periodic reseeding and regeneration of native pastures and edible bush, and as a drought mitigation measure.
3. The introduction of improved pastures (especially legumes) of proven capability to suitable areas.
4. The aids of agriculture — fodder cropping, stubble grazing, and grain supplementation.

TOWNSVILLE STYLO

In the mid-1960s, the outlook for beef production in some of the remote regions previously regarded as inferior cattle country changed dramatically with the advent of the new technology in pasture improvement, with the establishment of Townsville stylo, and the recognition of its potentially relatively high cattle-carrying capacity if adequately topdressed with superphosphate.

But, so far, this remote region capability remains largely in the realm of technological feasibility, since its translation to commercial, farm-scale reality is in only small proportion to my estimated potentially suitable total of some 73,436 square miles. Its economic feasibility has yet to be confirmed in large-scale practice. Individual graziers, in areas

of proven Townsville stylo capability, have confirmed, in small- to medium-scale plantings, the evidence afforded by scientific research of a year-round carrying capacity of a beast to 3 acres.[2] Over the 1966-9 period there have been relatively larger-scale sowings, along scientific guidelines, on big, company operated holdings in Arnhem and Peninsular regions but, so far, without appreciably affecting regional carrying capacities. Current statistics reflect no significant increase in cattle numbers of either region, over the period of this development, as table 9 shows.

Table 9
Average cattle numbers in remote regions of Townsville stylo capability, 1964-8

Year	Arnhem-N.T. Gulf *		Peninsular	
	Cattle number head	Cattle potential head	Cattle number head	Cattle potential head
1964	168,852		298,198	
1965	177,988		316,182	
1966	175,870		327,433	
1967	177,669		314,504	
1968	173,800		321,173	
Average	174,036	2,100,000	315,500	2,300,000

* Exclusive of Arnhem Land-Beswick-Daly River Aboriginal reserves.
Note: All figures are my estimates.

I estimate that approximately 4,687 square miles in northern areas of Kimberley region are suitable for Townsville stylo. Some interest has been shown by landholders in this zone in the possibilities of substantial beef production increase with the exploitation of this resource but, so far, none has undertaken large-scale sowing. What little has been undertaken seems to indicate that an additional 400,000 head of cattle could be carried in this area, half the estimated 800,000 head potential of the non-pasture improvable areas of the Kimberleys.

There are three critical factors of maintenance of Townsville stylo: fire, inadequate rainfall, and the encroachment of vigorous native plants, such as annual sorghum grass and similar coarse tropical species.

[2] Norman, op. cit., p. 14.

The environment in which Townsville stylo thrives is one wherein the grassfire hazard is common. This arises in seasons of lush growth, not only from dry electrical storms, but also from deliberate burning of coarse dry grass, in adjacent areas, in order to encourage a following green shoot from remaining soil moisture.

A substantial proportion of the Townsville stylo capability is contained in the Wyndham area in four cattle stations — Carlton and Ivanhoe, each of 1,560 square miles; one — El Questro, of 1,000, and one — Home Valley, of 700 square miles; and in the Forrest River Aboriginal Reserve.

El Questro and Home Valley are operated by resident holders. In 1967, the holder of El Questro had sown 50 acres of Townsville stylo with 100 lbs of superphosphate per acre, with promising results. The holder of Home Valley considered that 156 square miles of the property were suitable for pasture improvement, of which he had sown 4 square miles (without superphosphate) with promising results. Some hundreds of acres were sown with Townsville stylo in the 1950s at the Kalumburu Mission reserve, in the extreme northern area, also with promising results.

Successful results obtained in Townsville stylo sowings at the Northern Territory Administration experiment farm at Katherine, on a sandy soil comparable with large areas of a similar soil type on Ivanhoe, indicate that some hundreds of thousands of acres on that station, and on Carlton, would be suitable for that purpose.

I estimate the area of Townsville stylo capability, in the 25-30-inch rainfall zone of Qld Gulf region, at approximately 10,940 square miles, with an average carrying capacity of 1·2m. head at a beast to 6 acres. As much as one-third of this area, comprising more fertile soils of heavier texture than those which are most suitable for Townsville stylo, may be open to some doubt as to suitability in the ability of the plant to compete with vigorous native species common to these more fertile soil types.

Although there is sufficient evidence in 25-inch rainfall areas of Brigalow-Qld Coast regions to justify estimated carrying capacities of as high as a beast to 4 acres on well established and adequately fertilised Townsville stylo, there is no such evidence for comparable rainfall areas of Qld Gulf region. It may well be that the rainfall is more reliable

PLATE VIII *Cattle grazing on sorghum, late dry season, N.T.*
(photograph by CSIRO Division of Land Research)

PLATE IX *Native perennial grasses on Tipperary clay soils*
(photograph by CSIRO Division of Land Research)

PLATE X *Pasture sown with legumes, N.T.*
(*photograph by CSIRO Division of Land Research*)

PLATE XI *Townsville stylo pasture*
(*photograph by CSIRO Division of Land Research*)

in the 25-inch zone of the former than in that of the latter mentioned regions, where the doubt can only be resolved by experience.

Future land occupancy and utilisation, for beef production, in northern Australia should be considered separately in terms of those regions which, in the light of present technology, have demonstrably significant pasture improvement, fodder cropping, and other agricultural capabilities and those (confined to mainly native pasture resources) which have not. Regions falling within the latter category compose the greater part of Kimberley-Victoria-N.T. Gulf and the whole of Barkly-Centre-Channel, whose estimated combined potential cattle number of 4·9m. is relatively small in proportion to a northern Australian total of 28·5m. head.

In contrast to the hesitancy of the big absentee holders to undertake large-scale pasture improvement, a resident holder of a farm lease of 27 square miles, situated east of Katherine in Arnhem region, had, in 1966, embarked on an intensive development program involving the establishment of 16 square miles of Townsville stylo, of which the first 1,000 acres (half cleared and half open forest land) was completed by 1968. This farmer has already demonstrated year-round capacity of a beast to 5 acres on Townsville stylo in open forest country, sown with 5 lb of seed and topdressed with 100 lb of superphosphate per acre, on a holding which, in herd size terms, is substantially below my estimate of an efficient productive herd size of 10,000 head.

THE FUTURE OF THE REMOTE REGIONS

Over the ten-year, 1961-70 period, the economic outlook for substantial beef production increase in the remote northern regions, particularly the pasture improvable areas, has never been more favourable. Beef prices have risen markedly — almost spectacularly since 1965. Stock transport facilities have been vastly improved. The 600-mile Townsville-Mt Isa railway has been entirely reconstructed. Beef road construction has been advanced to a point at which facilities for the road transport of cattle are reasonable. New meatworks have been established at Katherine and Darwin, and existing ones at Broome, Derby, and Wyndham are being improved to conform to stringent United States beef import hygiene regulations. A deep sea outlet for

beef has been provided at Broome. Better wharfage and cold store facilities have been provided at Darwin. Plant and animal industry research and experiment has continued at an accelerated rate. There has been substantial private investment in stock watering facilities, fencing, stockyards, and buildings on some of the cattle stations of both large and moderate size. Doubtless, these favourable factors have strongly influenced United States investors in their purchase of large areas of cattle leasehold in the remote regions.

Yet, despite the favourable climate for massive private investment in beef industry development, and the buoyant economic outlook for Australian beef export, increases in both cattle numbers and turn-off have been merely marginal. The statistics of the two remote regions of high cattle potentiality (Arnhem-N.T. Gulf, and Peninsular) can only be described as depressing.

The current beef production picture of the Northern Territory, supported as it is with relatively very large Commonwealth expenditure on works and services, research, and experiment, is the most depressing of all. A very wide gap between research results and farm-scale reality remains to be bridged. There is little substantial evidence, at present, to encourage a belief that even a modest proportion of the Arnhem-N.T. Gulf beef potential is likely to be achieved in the near future. But it can still be achieved by sound development planning, adequate investment, and skilled direction and management, little of which is evident in the present situation.

In a paper ('The Challenge of Tropical Pastures in Australia') Dr E. M. Hutton, Chief, CSIRO Division of Tropical Pastures, makes the following opening observation:

> In northern Australia there is an untapped resource of about 260 million acres which could be sown to improved pastures and carry about 60 million cattle. *The Northern Territory could carry a fifth of this number.* It also has the potential to produce a high proportion of the pasture seed, particularly legumes, for development throughout tropical and sub-tropical Australia.[3]

Yet, the average number of cattle carried in Arnhem-N.T. Gulf (Darwin and Gulf Districts, see table 1) regions over the seven-year

[3] E. M. Hutton, 'Northern Territory Primary Producers Convention', 1969, my italics.

period to 1969 was only 201,000 head, the lowest being 179,000 in 1969.

I estimate the technologically feasible cattle-carrying capacity of the remote regions at 12·8m. head, of which 7·8m. (61 per cent) would be carried on introduced Townsville stylo pasture. The role of Townsville stylo in the remote region beef potential is, therefore, of serious importance.

Throughout this century, Townsville stylo has been recognised as a plant of considerable nutritional promise, capable of bridging protein deficiency in native pastures, particularly in far northern tropical, coarse grass areas of more than 25-inch average annual rainfall — country hitherto regarded as inferior for the purpose of cattle raising.

The technical feasibility of establishing Townsville stylo on poor soils, and, with the aid of superphosphate, of vastly increasing beef production in otherwise inferior northern high rainfall areas of moderate to low (60-200 acres/beast) cattle-carrying capacity on native pastures alone, is now widely acknowledged. It has also been demonstrated that, with good management, Townsville stylo will thrive on fertile soils in areas of 25-30 inches and higher average annual rainfall, given control of competition from native pasture species of vigorous growth.

CSIRO scientists have estimated that 93,750 square miles of northern cattle lands (shown in map 2) are suitable for Townsville stylo, including 39,000 square miles in Arnhem-N.T. Gulf-Victoria, 18,750 in Peninsular, 4,681 in northern extremities of Kimberley. Townsville stylo sowings over the five-year period 1965-9 were of the order of 200 square miles in Arnhem (see p. 8) and 39 square miles in Peninsular regions.[4]

Under experimental conditions, cattle have been carried on fertilised Townsville stylo in Arnhem and Peninsular regions at a beast to 3 acres. In farm-scale practice, this rate could be conservatively lowered to a beast to 6 acres in Arnhem, Peninsular, and Qld Gulf, and 7 acres in Kimberley regions. The evidence of results of scientific research suggests that the cattle-carrying capacity of Townsville stylo in these regions is many times greater than that of native pasture.

Kimberley: The average number of cattle carried for the five-year, 1965-9

[4] I. B. Staples, ibid.

period was 550,000 head at an average of approximately 7 to the square mile, in a range of 4 to 18. (The highest five-year average was 620,000 head in the 1914-18 period.)[5] On a native pasture basis alone, I estimate the technically feasible capacity at 800,000 head, at approximately 10 to the square mile in a range of 5 to 25 head.

The average annual turn-off for the five-year period to 1969 was approximately 65,000 head — 11·8 per cent of the average cattle number. I estimate technically feasible average annual native pasture turn-off at 120,000 head — 15 per cent of the potential cattle number.

I estimate that 4,687 square miles in northern Kimberley areas are suitable for Townsville stylo. At a conservatively estimated carrying capacity of a beast to 7 acres, this would add approximately 400,000 head to the native pasture capacity. The potential average annual turn-off of cattle carried on Townsville stylo pasture is estimated at 20 per cent — 80,000 head. Thus, the technically feasible cattle-carrying capacity of the Kimberleys is 1·2m. at an overall average of 15·6 to the square mile, with an average annual turn-off of 200,000 head — 16·6 per cent of cattle numbers.

Arnhem-N.T. Gulf-Victoria-Barkly-Centre: For administrative and statistical purposes, the Territory was divided into four districts. These are related to the regional delineation shown in map 2, as follows:

District	Region
Darwin and Gulf	Arnhem, N.T. Gulf
Victoria River	Victoria
Barkly Tableland	Barkly
Alice Springs	Centre

Table 10 shows my estimate of the technically feasible cattle potential of Northern Territory cattle regions.

Of 39,000 square miles of suitability for Townsville stylo pasture in Arnhem-N.T. Gulf regions, I estimate that a slightly higher proportion lies in the Arnhem Land, Beswick, and Daly River Aboriginal reserves. The actual proportions have not yet been measured, a more detailed

[5] Bolton, Survey of the Kimberley Pastoral Industry, Appendix VI.

survey being necessary to determine this. However, Perry's map of the pasture lands of the Territory indicates to me that approximately half of the country best suited to Townsville stylo (carrying predominantly annual sorghum and kangaroo grasses) is in the Arnhem Land and Daly River reserves, of a combined area of 42,367 square miles.[6]

Table 10
Technically feasible Northern Territory cattle potential

Region	Potential cattle number head	Potential cattle turn-off head	Percentage of herd turn-off	Average on-station value of turn-off $A80 each $Am.
Barkly	600,000	150,000	25	8·0
Centre	400,000	100,000	25	12·0
Arnhem-Victoria-N.T. Gulf	5,000,000	970,000	19	77·6
Total	6,000,000	1,220,000	av. 20·3	97·6

Although authoritative apportionment is lacking, I estimate that 20,312 square miles in these reserves are suitable for Townsville stylo. At a beast to 6 acres (adult dry cattle equivalent), plus native pasture capability of 0·15m. head, the technically feasible carrying capacity of the reserves would be 2·3m. head. Thus, the grand total of technologically feasible Territory cattle-carrying capacity would be 6m., at an average of 18·5 head to the square mile of 324,325 square miles (including Arnhem Land, Beswick, and Daly River Aboriginal reserves) of cattle country.

The possible percentage of annual herd turn-off is related to the *purpose* of cattle raising to which particular environments are best suited, i.e. turning-off young cattle as stores or mature cattle as fats. The principal factors of determining suitability of purpose are the quantity and incidence of rainfall and the nutritive quality of native and improved pastures.

Most of the native pastures in all regions to the north of approximately lat. 16°S are of coarse, tropical types, of low nutritive value and carrying capacity, and of poor fattening quality. The rainfall, which

[6] R. A. Perry, 'Pasture Lands of the Northern Territory, Australia'. CSIRO, Canberra, 1960.

usually occurs in the December-March period, varies between 25-30 inches in the south and 50-60 inches in the north. The last four months of the eight-month dry period are critical to the nutritive value of pasture. A marked downturn in the nutritive level of the native pastures occurs in May-June. From then to the onset of the wet (normally November-December) cattle condition commonly deteriorates progressively to the limit of extreme emaciation, with high breeder and calf mortality. An additional disadvantage is that in this zone, cattle tick and buffalo fly infestations are of the worst in the north.

My station by station investigations showed that this is a rather harsh environment, of high rainfall and high humidity in the wet season, to which the British breeds of cattle of low heat tolerance and lacking tick resistance are not well adapted. The native pasture average stocking rate is low. The rate of calf survival of British breeds is of a low order of about 40 per cent. The average age of native pasture slaughter cattle is 5-6 years; the average carcass weight is about 500 lb.

The brahman breed of cattle, with the advantages of heat tolerance and tick resistance, is adapted to harsh environments. But some brahman types are of nervous disposition, tending to wildness unless kept well under control. Control can be maintained in well-fenced and adequately watered country. Allowing that calf survival of brahman cattle would be higher, and age of maturity substantially lower than in the case of British breeds, the resultant proportionately higher turn-off would still not economically justify adequate fencing and water supplies, under native pasture conditions.

A former manager of the experiment farm at Katherine, who has had many years of experience of northern high rainfall areas, has nominated what he describes as the 'Capricornia Shorthorn' as the ideal breeder for this environment. He considers that these shorthorns, descended from those brought to the Territory in the 1880s, have built up a degree of heat tolerance and, to a lesser degree, tick resistance. If crossed with Santa Gertrudis bulls (which are $\frac{5}{8}$ shorthorn and $\frac{3}{8}$ brahman), and with adequate nutrition, the hybrid vigour of the cross-bred progeny would ensure early maturity and good carcass weight.

In native pasture conditions, Arnhem-N.T. Gulf regions compose inferior breeding country of low fattening potential. Because of remote-

ness from good fattening country, the only outlet for cattle raised on native pasture in these regions is for slaughter as lean beef of manufacturing quality.

However, much of the country is suitable for Townsville stylo. With the relatively intensive, year-round grazing capability of well-established Townsville stylo pasture, the brahman breed of cattle would be ideally suited to Arnhem-N.T. Gulf-Victoria regions. Carcass weight of brahman-cross cattle of 550 lb should be possible at the age of 3 years. A calf survival (to yearling age) rate of 70 per cent could be achieved on well-fenced and adequately watered Townsville stylo pasture. I estimate (conservatively) average annual turn-off at 20 per cent of herd numbers on Townsville stylo and 15-17 per cent on native pasture — 0·97m.

Barkly and Centre regions are best suited to turning-off males, as stores, at weaner (8-10 months) to yearling-15-month average. The average annual rainfall of Centre region varies between 6 inches in the south and 12 inches in the north. That of Barkly region varies between 10 inches in the south and 20 inches in the north. Rainfall in both regions is unpredictable; both are vulnerable to drought.

The nutritive quality of native pastures in Barkly and Centre regions is moderate to high, but drought vulnerability renders both regions unsuitable for holding males to 3-5 years for fattening. If breeders in these regions do not have to compete with growing males for available feed in adverse seasons, the drought risk factor is much less critical and a higher level of efficiency in herd and pasture management is possible, particularly where breeders are relieved, by regular weaning of calves, of the dual stress of lactation and pregnancy at a period of the year when pastures are of low nutritive quality. I estimate average annual rate of turn-off from these regions at 25 per cent — 0·25m. head.

I estimate the technically feasible average annual Territory turn-off at 1·22m. head — approximately 0·83m. from Townsville stylo pasture and 0·39m. from native pasture.

Channel: Of the six cattle regions of Queensland (map 2), the area commonly known as the Channel country (embracing the south-western corner of Queensland and the north-eastern corner of South Australia)

appears to be the only one in which, lacking irrigation, there are at present neither pasture improvement nor agricultural possibilities. Although its topographical uniqueness is known to geographers throughout the world, and the high fattening quality of its native pasture is well known to northern cattlemen, relatively few are aware that overall Channel country cattle-carrying capacity (about 4 head to the square mile) is among the lowest in northern Australia.

Nevertheless, in the context of effective integration of the cattle breeding and fattening resources of the non-pasture improvable areas, the cattle fattening capability of Channel region is of exceptional importance in providing an outlet for a substantial proportion of young store cattle bred in Barkly region, in eastern areas of Victoria region, and in western areas of Qld Gulf region.

Cattlemen of long experience of Channel country conditions consider that its most suitable purpose is in the fattening of young store males, bred in areas within economic range of rail or road transport. There are now adequate facilities for the transport of store cattle from breeding areas, and of fattened cattle to railway loading centres for movement to slaughtering points. In normal seasons, such cattle could be fattened to 600-700 lb carcass weight at 30-36 months.

Channel region is bounded on the north by an approximate line from the point where Pituri Creek crosses the Territory-Queensland border (see map 5, p. 124), to Collingwood via the junction of the Burke and Wills rivers; on the east by a line running south to Hungerford, on the New South Wales border; on the south following the N.S.W. border line and continuing west to Lake Kopperamanna, in South Australia; and on the west by a line running north via the Territory border to the Pituri. The total area within these boundaries is approximately 147,000 square miles, of which about 30,000 square miles are in the South Australian portion.

The Cooper is the most important of the Channel country river systems. It rises as Torrens Creek, on the western slope of the Great Dividing Range at a point about 30 miles to the north of Torrens Creek siding on the Townsville-Mt Isa railway. In its south-westerly course it becomes the Thompson River and from the point of its junction with the Barcoo River, it becomes Coopers Creek, flowing into Lake Eyre at

maximum flood. From a complex of major channels, it floods out into minor channels from the vicinity of Windorah.

The Diamantina River rises about 100 miles south-east of Cloncurry. At maximum flood, the Diamantina spreads out through a network of major and minor channels to a width of more than 50 miles. It floods out into Goyders Lagoon, in South Australia, and at maximum flood joins the floodout of the Georgina to form the Warburton River, which flows into Lake Eyre.

The Georgina River rises on Rocklands Station, on the Northern Territory side of the Queensland border, about 40 miles to the north-west of the Queensland town of Camooweal. This system embraces the Burke, Wills, Hamilton, and Mulligan rivers and King Creek. At maximum flood, it joins the Warburton River and flows into Lake Eyre.

The Bulloo River — the minor system — floods out in north-western New South Wales.

An investigation carried out by Queensland governmental authorities in 1945 indicated that at full flood the area inundated approximated 15,000 square miles, about 10 per cent of the total area. This constitutes the Channel country proper, the balance being the off-Channel country. Thus, the flooded parts comprise the minor, not, as many imagine, the major proportion of the Channel region.[7]

The average number of cattle carried in the Queensland portion of the Channel region for the five-year period to 1969 was 350,000 head at approximately 2·4 to the square mile; the number turned-off annually averaged approximately 60,000 head. The region was drought affected for three of the five years. The ten-year average number of cattle carried to 1969 was approximately 450,000 head, the average annual turn-off being 70,000 head. Approximately 60 per cent of the cattle turned-off from the Channel country are bred there; 40 per cent are fattened store cattle imported from Barkly and Qld Gulf regions.

Assessment of the Channel country cattle-carrying capacity largely depends on the purposes of cattle raising for which the pastoral resources are utilised. If utilised for fattening imported store cattle, I

[7] Queensland, Bureau of Investigation, Technical Bulletin No. 1, 'The Channel Country of South-west Queensland, with special reference to Coopers Creek', 1947.

estimate the average carrying capacity at 600,000 head (approximately 4 to the square mile, in a range of 3 to 7 head).

As regards the potential Channel region cattle turn-off, the 1945 Queensland Royal Commission on Abattoir Development estimated this at 400,000, 600,000, and 800,000 in years of medium, good, and major flood. I estimate that, with existing adequate road transport facilities for the rapid inward movement of store cattle of 10-24 months age, and for outward movement by road and rail of fat cattle in normal seasons, and unfinished cattle to market or relief country in adverse seasons, the annual turn-off, based on fattening store cattle, would average 300,000 head — 50 per cent of cattle carried. Based on breeding and fattening, annual turn-off would average 120,000 head — 20 per cent of cattle carried.

Qld Gulf: In the 1954-7 period, I carried out a survey of Qld Gulf for the B.A.E., in collaboration with the Land Research Division of CSIRO. The survey area embraced 117,000 square miles, of which approximately 80,000 square miles were used for cattle and the remainder for sheep. The survey considered sixty sample cattle properties totalling 39,000 square miles.

The region carried approximately 1m. head of cattle, at an average of 12·5 to the square mile in a range of 5 to 27 head. I estimated the potential, on a native pasture basis, at 1·25m. at an average of 15·6 to the square mile, in a range of 5 to 25 head, with an average annual turn-off of 25 per cent of herd numbers.

Of the sixty properties studied, eight holders had experimented with Townsville stylo, mostly with promising results. Sixteen had endeavoured to spread buffel grass, some with quite promising results. Buffel grass had volunteered in many parts of the Gulf country, particularly along the Cloncurry River frontage.

The manager of one of the sample holdings (average annual rainfall 30 inches) was convinced that the dry season pasture nutrition gap could be bridged by pasture improvement. Since 1934, he had concentrated on establishing Townsville stylo, with satisfactory results. He had also sown buffel grass with satisfactory results. The principal object of pasture improvement was to reduce breeder and calf mortality.

The main conclusion drawn from this survey was that cattle production could be substantially increased through expanded breeder strength and higher percentage turn-off. My conclusion was that most of the region was best suited (on native pasture) to breeding and restricted fattening, i.e. turning-off males as stores at an average of about yearling age; disposing of surplus heifers as potential breeders or fattening them for turn-off at about 4 years; and fattening cast-for-age breeders after rearing their fifth or sixth calf. Essential to such development would be enduring markets for young store males and surplus females.

The general conclusions drawn from the Qld Gulf survey were confirmed by a smaller sample but a more detailed survey I made in 1967. Over the 1957-67 period, there has been substantial increase in station structural improvements; the beef roads program has been advanced to a point where road transport facilities are now reasonable. There is no longer doubt as to the enduring nature of the store cattle market. (In fact, the present supply of store cattle everywhere in Queensland is so far below the present demand as to force prices up to a point at which it is uneconomic for many fatteners to buy. The result of this is that much country — Channel, wallum, and brigalow, best suited to fattening purchased stores — has to be used for breeding and fattening.)

Qld Gulf region is bounded on the south by a line running from about Mingela (between Townsville and Charters Towers) west to the point at which the Northern Territory border is bisected by the 22nd parallel; on the west by the Territory-Queensland border; on the north by the shore of the Gulf of Carpentaria, to the mouth of the Norman River, thence easterly to the Great Dividing Range, on the east by the western boundary of Qld Coast region.

The average annual rainfall in Qld Gulf region varies between about 18 inches in the south and 35 inches in the north. The rainfall is of summer incidence, the wet season generally being over the November-March period. In common with other areas to the north of lat. 20°S, a factor of cattle raising is the annual eight-month dry season. Although the native pastures are generally superior to those to the north of 15°S, the problem of maintaining cattle condition through the annual dry period is still a critical one.

I estimate the area of Qld Gulf region suitable for cattle raising on native pasture at approximately 100,000 square miles. The potential cattle-carrying capacity, based on utilisation for breeding and restricted fattening, is estimated at 1·5m. head, with an additional capacity of 1·2m. head from 10,940 square miles of Townsville stylo (in areas above the 25-inch rainfall isohyet), at a beast to 6 acres. The total capacity of the region is 2·7m. head, at an overall average of 27 head to the square mile.

Assuming the main purpose of cattle raising to be breeding and restricted fattening on native pastures, and breeding and fattening on Townsville stylo pasture, I estimate the average annual turn-off at 620,000 head — about 23 per cent of total cattle numbers.

Peninsular: Peninsular region comprises that part of Queensland to the north of the northern boundaries of Qld Gulf and Qld Coast regions and totals approximately 78,125 square miles. The average number of cattle carried for the five-year period 1964-8 was 315,000; the average annual turn-off was approximately 45,000 head.

With the exception of three stations purchased by United States interests in 1965, on which there has been substantial investment in structural improvements and in the sowing of Townsville stylo and where station and herd management has been greatly improved, and one station under intensive development by an Australian purchaser in 1969, the standard of cattle raising in Peninsular areas to the north of the Mitchell River is near primitive. The present average stocking rate is about 4 to the square mile. The native pastures are predominantly of inferior, coarse, tropical types. Station structural improvements are wholly inadequate. The quality of the cattle is poor. Facilities for the overland droving of cattle in the northern areas are of the worst in northern Australia.

The country and the native pastures of that part of Peninsular region to the south of the Mitchell River are of better quality. Station structural improvements, though still inadequate, are of higher standard. The cattle are of better quality. Facilities for the movement of cattle are better, though still inadequate. The present stocking rate is about 8 to the square mile.

The average annual rainfall, most of which falls in summer, varies

between 30 inches in the south and 60 inches in the north. In common with other regions of the far north, highly critical factors of cattle raising are the eight-month annual dry season, the low level of native pasture nutrition over the June-December period, and the intensity of cattle tick and buffalo fly infestation.

With minimum structural improvements, averaging one permanent made watering point and 20 miles of fencing per 100 square miles, I estimate the potential average native pasture cattle-carrying capacity at 500,000 head — 6·5 to the square mile in a range of 5 to 15, with an average (breeding and fattening) annual turn-off of 15 per cent of herd numbers — 75,000.

Townsville stylo has been recognised as a valuable pasture plant, adaptable to the Peninsular environment, since the early 1920s. But little in the way of systematic spreading and fertilising of the plant was attempted until major sowings were undertaken on behalf of United States' proprietors of Lakefield, Laura, and Silver Plains Stations in 1965-7, when approximately 31 square miles were sown, with moderate to heavy dressings of superphosphate. The evidence of successful establishment on adequately fertilised, reasonably prepared land indicated a high cattle potential of Peninsular areas where soil and timber density conditions are suitable.

I estimate that 18,750 square miles in Peninsular region are suitable for Townsville stylo — 24 per cent of the region's total area of presently occupied cattle country, approximately 80,000 square miles. Here, as in Arnhem-N.T. Gulf, research and experiment indicate a year-round capability of a beast to 3 acres on adequately fertilised Townsville stylo under comparable conditions. A carrying capacity of a beast to 6 acres is possible. I estimate the economically feasible cattle-carrying capacity of Peninsular region (presently occupied country) at 2·3m. head — 2m. on improved pasture, at an overall average of 29 head to the square mile, with an average annual turn-off of 460,000 head — 20 per cent of total cattle numbers.

THE INSIDE REGIONS

Qld West: Qld West region is mainly used for woolgrowing. It carries most of Queensland's sheep. The region is bounded on the west by the

eastern border of the Channel country; on the south by the New South Wales border, between Mungindi and Hungerford; on the east by a line running irregularly north from Mungindi to Charters Towers; on the north by a line running westerly from Charters Towers to the vicinity of Kynuna.

The areas used largely for beef cattle compose the eastern part of Qld West, which includes good native pasture fattening country. Some of the cattle country carries dense scrub in which some brigalow occurs. In the 1960s, there has been considerable scrub pulling and burning, with the sowing of fodder crops and pasture grasses.

The present cattle number in the region is approximately 800,000 head, with an average annual turn-off of about 160,000 head. Some of the properties carry both sheep and cattle. Both sheep and cattle properties are fairly well improved. As to the cattle potential, it is unlikely that average overall cattle numbers will increase substantially but, with the current trend in timber and scrub clearance and station structural improvement, the average annual turn-off should increase to 200,000 head — 25 per cent of cattle carried.

Brigalow-Qld Coast: For convenience in description, beef production potentialities of Brigalow and Qld Coast regions are considered together. Areas of influence of four principal centres, Rockhampton-Bowen-Mackay-Townsville, extend into Brigalow region. Beef cattle numbers in the two regions in 1969 totalled approximately 4m. — 58 per cent of Queensland's 1969 total of 6.9m.

Brigalow region is bounded on the south by the New South Wales border; on the west by the eastern boundary of Qld West region; on the north by the southern boundary of Qld Gulf region; on the east by an approximately northerly line running from a little to the east of Goondiwindi through Tara, Theodore, Duaringa, and Nebo to the south-eastern corner of Qld Gulf region. Qld Coast region is bounded on the south by the New South Wales border; on the west by the eastern boundaries of Brigalow and Qld Gulf regions; on the east by the Queensland coast.

Brigalow-Qld Coast regions comprise Australia's areas of presently and potentially highest beef cattle density. In 1961 I estimated the beef

cattle potentials of these regions at 7·1m. head. But at that time the surface of the brigalow belt beef potential had barely been scratched; intensive beef production in the wallum country, and in northern wet coast and forest areas, was in early stages of research, trial, and experiment. Most graziers were then sceptical regarding the economic feasibility of high-level cattle carrying, based on fertilised Townsville stylo.

In 1959, the economics of large-scale transport of cattle by road were still regarded doubtfully by Commonwealth governmental authorities. The long-term meat agreement with the United Kingdom remained the foundation upon which northern beef industry development was based.

With the rising United States demand the economic outlook for export beef in the 1960s encouraged accelerated public and private investment in beef industry development in Brigalow-Qld Coast regions at a rate never previously contemplated. In public investment, this was reflected in Commonwealth monetary grants for beef roads programs, in loans to the Queensland government for brigalow lands development, and in plant and animal industry research by the Queensland Department of Primary Industries and the CSIRO. Private investment in station structural, agricultural land, pasture, and herd improvements proceeded at unprecedented rate. Fertiliser firms allocated substantial funds to pasture improvement research and assumed an active role in rural extension services.

These developments justified reassessment of my 1961 estimate of a beef cattle potential of 7·1m. in Brigalow-Qld Coast regions to a higher level. The basis for such reassessment is now more of a factual nature than was the case in 1960, but present estimates of beef potential of these regions must still be largely based on judgment.

More than half of my estimated beef potential of Brigalow-Qld Coast regions exists within a radius of about 160 miles of Rockhampton — an arc extending from Mackay, in the north, touching Capella-Emerald-Springsure-Taroom in the west, to Bundaberg in the south. Within this radius there are approximately 23,437 square miles in the region in which brigalow occurs, capable of intensive development; 12,500 square miles with technologically proven Townsville stylo capability;

31,250 square miles of non-pasture improvable, open forest country with an average native pasture carrying capacity, following adequate timber treatment, of a beast to 10 acres. I estimated the potential cattle-carrying capacity of these areas at 8m. head: brigalow country, 4m.; Townsville stylo capability, 2m.; open forest country, 2m.

In the south-eastern corner of Queensland, an area totalling 53,239 square miles carried 1·47m. beef cattle, 0·68m. dairy cattle, and 3·68m. sheep in 1968. This area is largely used for mixed enterprises in which sugar cane, wheat, and grain sorghum growing, dairy farming and pig raising, merino sheep and beef cattle raising predominate.[8]

Because of its situation in relation to areas of high cattle density, high and relatively reliable rainfall, and the high fertility of much of its soils, this part of Queensland is particularly well suited to the production of early maturing, farm-fattened beef of prime quality. Excluding the 3,125 square mile coastal strip of wallum country, beef cattle numbers within the three statistical divisions could be increased to 3m. In the long-term view, this estimate is, admittedly, perhaps an over-cautious one. If the feed-lot form of beef enterprise develops, the number of beef cattle carried in this area would be substantially greater than 3m.

Beyond the 160-mile central coastal radius of Rockhampton, and the Moreton-Maryborough-Downs statistical divisions portions of ten shires intrude into Brigalow region. Beef cattle numbers for these shires in 1969 totalled 1·21m. My assessed proportions, between 50 and 70 per cent of numbers ascribed to Brigalow region, totalled approximately 0·78m. Here, the basis of my assessment of a 1·6m. head beef potential must necessarily be largely one of conservative judgment.

The wallum zone of south-eastern Queensland embraces approximately 2,953 square miles of relatively infertile land, in a coastal strip extending from a point 30 miles north of Brisbane to about 170 miles farther, to the north of Bundaberg. The average annual rainfall varies between 70 inches in the south and 40 inches in the north, spread mainly over the November-May period. The climate is equable, extremes of heat and cold being rare.

The wallum has been the subject of intensive scientific research and

[8] Bureau of Census and Statistics, Brisbane, S.R. 12/69.

PLATE XII *Active gully erosion in the Ord River catchment area (photograph by W.A. Department of Agriculture)*

PLATE XIII *A well-established stand of kapok bush, Ord River regeneration project (photograph by W.A. Department of Agriculture)*

PLATE XIV *A stand of brigalow, cleared land in the foreground (photograph by Department of National Development)*

PLATE XV *Clearing brigalow scrub (photograph by Department of National Development)*

related economic discussion over the past decade. Major financial concerns have shown active interest in its development in recent times. The Caloundra Pastoral Company is in the process of intensively developing 17 square miles, with a good prospect of success.

A large proportion of the wallum (1,399 square miles) is covered by State and private forests and timber reserve. Approximately 791 square miles are occupied mainly for dairy farming and beef cattle fattening.

Assuming that the areas reserved as State forests and those used for private forestry and for public purposes remain as such, approximately 1,288 square miles, including presently vacant Crown land, are available for rural development.

I estimate the economically feasible cattle capacity of Brigalow-Qld Coast at 14·9m. head, with an average annual turn-off of 6m. — 40 per cent of 14·9m. — in a range of 20 to 100 per cent according to the purpose of production — breeding and fattening or fattening purchased stores on native and improved pastures with or without the aid of cultivated crops.

THE OVERALL POTENTIAL

Table 11 shows my estimated economically feasible beef cattle capacity of all regions of northern Australia, attainable about the turn of the century.

Table 11
Beef cattle capacity of northern Australia

Region	Cattle number m. head	Turn-off m. head
Kimberley	1·2	0·2
Arnhem-Victoria-N.T. Gulf	5·0	1·0
Barkly	0·6	0·2
Peninsular	2·3	0·5
Qld Gulf	2·7	0·6
Centre	0·4	0·1
Channel	0·6	0·3
Qld West	0·8	0·2
Brigalow-Qld Coast	14·9	6·0
Total	28·5	9·1

Note: Average annual turn-off of total cattle numbers — 31·5 per cent.

Table 12

Inside region pasture improvable plus fodder crop areas: economically feasible efficient productive herd size capability

Region	Number	Cattle Turn-off	Av. herd size	Development Cost per beast-area	Development Total	Capitalisation Plant, equipment, horses	Capitalisation Breeders and bulls	Capitalisation Total	On-station return	Net return	Rate of return
	m. head	m. head		$A	$Am.	$Am.	$Am.	$Am.	$Am.	$Am.	%
Central and North											
Brigalow	4·0		1,500	70	280	20·0	89·6	389·6			
Townsville stylo	2·0		3,000	56	112	10·0	44·8	166·8			
Open forest	2·0		4,000	40*	92	11·5	51·5	155·0			
Northern											
Townsville stylo	1·0		3,000	60	60	5·0	22·4	87·4			
Open forest	0·3										
Wet coast rain forest	0·4		2,000	100	40	2·0	9·0	51·0			
Brigalow											
10 shires†	1·6		5,000	60	96	8·0	35·8	139·8			
S.-east‡	3·0		2,000	80	240	15·0	67·2	322·2			
Wallum	0·6		1,500	100	60	3·0	13·5	76·5			
	14·9	6·0	av.2,750	av. 65·8	980	74·5	333·8	1,388·3	660	264	19·0

* Includes the cost of timber treatment.

† Proportion of the potential cattle number of the following shires which intrude into Brigalow region: Waroo-Bungil-Bendemer-Taroom-Belyando-Emerald-Bauhinnia-Peak Downs-Ayr-Bowen.

‡ Statistical divisions Moreton-Maryborough-Downs.

Table 13

Remote region desirable land occupancy system, non-pasture improvable economically feasible efficient productive herd size capability

Region	Av. herd size	Cattle Av. turn-off	Price per head	Structural improvement	Capitalisation		Total	Return			Rate of return
					Plant, equipment, horses	Breeders and bulls		On-station return	Working costs	Surplus	
	head	head	$A	$A'000	$A'000	$A'000	$A'000	$A'000	$A'000	$A'000	%
Kimberley	7,000	1,050	80	161·0	35	181·4	377·4	84·0	37·8	46·2	12·2
Arnhem-N.T. Gulf	8,000	1,200	70	208·0	40	175·4	423·4	84·0	36·1	47·9	11·3
Victoria	8,000	1,360	80	208·0	40	207·4	455·4	108·8	46·8	62·0	13·6
Barkly	5,000	1,250	55	185·0	25	162·0	372·0	68·8	29·6	39·2	10·5
Peninsular-Qld Gulf	5,000	1,250	60	150·0	25	162·0	337·0	75·0	33·8	41·2	12·2
Centre	5,000	1,250	70	250·0	25	174·5	449·5	87·5	35·0	52·5	11·7
Channel	4,000	800	100	200·0	25	177·8	413·8	80·0	36·0	44·0	10·6
Average	6,000	1,166	74	194·6	31	177·2	404·1	84·0	36·4	47·6	11·7

Table 14

Beef cattle industry of northern Australia economically feasible productive capacity

Region	Cattle No.	Cattle Turn-off	Turn-off	Capitalisation	Per beast-area	On-station return	Annual costs Per head of cattle carried	Annual costs Total	Net return	Rate of return
	m. head.	m. head.	%	$Am.	$A	$Am.	$A	$Am.	$Am.	%
Queensland										
Peninsular-Qld Gulf-Channel-Qld West-Brigalow-Qld Coast	21·3	7·6	33·8	1,868·8	87·7	790·1	21·8	465·1	325·0	17·4
Northern Territory										
Arnhem-Victoria-N.T. Gulf-Barkly-Centre	3·7	0·8	20·5	314·0	84·9	63·8	8·7	322·4	31·6	10·1
Aboriginal reserve	2·3	0·5	19·6	215·2	93·6	44·6	10·6	24·4	20·2	9·4
Total N.T.	6·0	1·3	20·0	529·2	88·2	108·4	9·4	56·6	51·8	9·8
Kimberley	1·2	0·2	16·6	81·7	68·1	17·6	7·3	8·7	8·9	10·9
Total	28·5	9·1	31·5	2,479·7	av.87·0	916·1	av.18·6	530·4	385·7	av.15·6

Achievement of the cattle potential of Queensland's inside regions is more likely than that of the remote regions. Here, the average size of cattle properties is much smaller. Most are operated by resident occupiers. Most of those held by absentees are reasonably well improved and managed. Many individual herd sizes are less than the average of efficient productive unit size. The rate of return on capital is substantially higher than that of the remote regions.

I estimate the economically feasible inside region beef cattle potential as shown in table 12.

My 1967-70 survey information obtained in investigation of 'sample' holdings of moderate size, indicates an economically feasible native pasture capacity of 4·9m. head of cattle in the remote regions, based on effective land occupancy and utilisation (given continuance of present cattle price-property improvement and operating cost relationship) as follows: Peninsular-Qld Gulf-Channel regions, 2·4m.; Arnhem-N.T. Gulf-Victoria-Barkly-Centre regions, 1·7m.; Kimberley region, 0·8m. Table 13 provides an appreciation of such feasibility.

Table 14 shows my estimated overall economically feasible productive capacity, costs of development, and rate of return on capital of the north Australia cattle regions, on the basis of effective land occupancy and utilisation.

DEMAND FACTORS

We have seen that up to the outbreak of World War II the beef industry in northern Australia was almost chronically in a state of near-bankruptcy. This was obvious from the low average price of $8.74 per head of cattle slaughtered at Wyndham, the remotest northern export meatworks, for the twenty-year period to 1939, compared with the 1970 average of more than $80.

Over the twenty-five years of the post-war period (1945-69), the outlook changed progressively for the better with an increasing demand for export beef at payable prices to the producer. Australian beef export rose from 64,100 tons in 1945 to 262,150 tons in 1969, with a peak of 309,000 tons in 1965. The twenty-year annual average beef export to 1963 was 115,000 tons, that of the six-year period to 1969 was 270,000 tons. Two factors which contributed materially to export buoyancy

were the floor-price provisions of the 1952-67 meat agreement with the United Kingdom and, more importantly, the advent of the United States' market for lean beef in 1959 and over subsequent years at satisfactory prices to the producers.[9]

The buoyant economic outlook for Australian beef in the post-war period, particularly the last decade, has encouraged belief in the economic feasibility of substantial increase in beef production in northern Australia. This has been borne out by accelerated investment in cattle station improvement in most areas of the north, by both resident cattlemen, and by Australian and overseas absentee pastoral interests.

Australian consumer demand has always provided the most stable market for beef. The greater part of production, mostly of the best quality, is absorbed in the domestic market. The rate of domestic consumption is determined more by retail price than by other factors. Pre-1940, beef was cheap in Australia compared with other protein foods; then, *per capita* consumption was 144 lb a year carcass weight. Post-1945, consumption declined to a low of 85·3 lb in 1967. The ten-year average to 1969 was 98 lb.[10]

If the future *per capita* beef consumption averages 100 lb a year, annual domestic demand will require 44,642 tons per million persons. In 1965, the Commonwealth Statistician issued a population projection indicating 19·6m. people by 1986. Extrapolating this to 1998, I estimate the population should then be 25m.; the domestic beef need (at 100 lb per head) would be 1·1m. tons.

Estimation of beef production by 1998 must include Australia's overall potential. Assuming that the estimated northern beef cattle potential of 28·5m. will be achieved by 1998, the question arises as to the potential of southern Australia.

The beef production trend in southern Australia has been more markedly upward in the 1960s than that of the north. Indications are that this will continue, particularly if the export outlook for other primary products — e.g. dairy, wheat, wool, sugar — continues to be

[9] A.M.B., *Annual Reports*, Table 38, p. 112, 1965; Table 3, p. 107, 1969.

[10] Ibid., Table 35, p. 94, 1966; Table 2, p. 106, 1969. (Bone-in weight plus my estimated 4 lb canned bone-in equivalent.)

unfavourable. If the present buoyant outlook for beef continues, increasing numbers of primary producers will include beef in production diversification programs. Thus, it would be difficult accurately to estimate southern beef production in the long term, but it would be safe to assume that production increase will be substantial.

The following percentage increases in beef cattle numbers over the twenty-year, 1950-69, period reflect a much higher rate in southern than in northern Australia: New South Wales 84 per cent; Victoria 173 per cent; South Australia 227 per cent; Western Australia 113 per cent (excluding Kimberley region, 329 per cent); Tasmania 192 per cent; Queensland 42 per cent; Northern Territory 12 per cent; Kimberley, 29 per cent. The increase in southern Australia was 128 per cent; in northern Australia 36 per cent.[11]

In 1939, Australia's beef cattle numbered 8·4m., of which 6·1m. were in northern Australia. In 1969, the Australian total was a record 16·1m., of which 8·6m. were in northern Australia.[12] Assuming an upward trend, beef cattle numbers in southern Australia should reach approximately 10m. before 1998.

Australian dairy cattle numbers varied between 4·9m. in 1939 and 4·5m. in 1969. (In 1969, dairy cattle yielded about 12 per cent of Australia's beef.) There being no present indication of substantial increase in dairy cattle numbers in the next thirty years, an arbitrary assumption of 5·5m. by 1998 would be justified. On these bases of estimation, Australia's total cattle should number 44m. by 1998, an increase of 112 per cent on the 1969 total of 20·7m.

Australian beef and veal production averaged 112 lb per head (carcass weight) of total cattle numbers for the five-year period to 1969. At a conservative average of 110 lb, average annual production should reach 2·16m. tons by 1998, leaving a surplus of approximately 1m. tons for export. Australia produced a record 1,011,700 tons of beef and veal in 1969-70.

The principal factors in achieving an attainable beef potential are the maintenance of Australian demand for beef at about the *per capita* consumption level of the 1960-9 period (100 lb), and market outlets for

[11] *The Beef Situation*, No. 14, March 1970, Table III, B.A.E., Canberra.
[12] A.M.B., op. cit.

exportable surplus at prices ensuring economic returns to beef producers.

The United Kingdom was Australia's most important outlet for surplus beef up to 1959. The floor-price provision of the fifteen-year meat agreement, under which Britain agreed to purchase Australia's surplus at payable prices, was negotiated on government-to-government level. Previously, under trader-to-trader arrangements, Britain imported Australian beef largely on her own price terms, which often denied producers an adequate return.

Australian beef exports to other than the United Kingdom market were negligible up to the advent of the United States' demand for beef of manufacturing quality in 1959, since when the United States has displaced the United Kingdom as the major importer. The United States took 78 per cent in 1966-7 and 72 per cent in 1967-8 of Australia's total beef exports. In 1968, Australia supplied 49 per cent of United States' total beef imports (54 per cent in 1967).

Although United States' capacity to absorb Australia's surplus beef is not unlimited, there is no present indication of seriously diminishing demand for beef of manufacturing quality. In the long term, the United States population will increase at a greater rate than its cattle numbers. Therefore, demand for beef is likely to rise and Australia's share of beef imports seems to be secure, given continuing meticulous observance of United States import hygiene standards and avoidance of exporting beef of a better than manufacturing quality that United States producers might regard as a threat to their vital interests.

Under United States legislation enacted in 1964, contingency quotas can be applied to imports of beef, veal, and mutton, when such imports are expected to exceed 110 per cent of an adjusted base quantity which is 323,840 tons, approximately the average of annual imports from 1959 to 1963.

The adjusted quantity for 1968 was set at 442,000 tons (990m. lb), 30 per cent above the base quantity, the 'trigger' level being 1,086·8m. lb — related to a base quota of 988m. lb. Imports of meat subject to quota legislation rose sharply in the middle months of 1968 and if this rate of increase had continued it would have led to the imposition of

quotas. Consequently, Australia, in line with other suppliers, decided to impose restraint on beef shipments to the United States.

At the September 1968 quarterly review, imports were estimated to reach 442,000 tons, that is, below the level which would involve the imposition of quotas. A similar situation developed in 1969, leading to restraint similar to that imposed in 1968. Nevertheless, Australia's near 50 per cent share of United States total beef imports would not be unfavourable if it continued at that level.

Views recently expressed by well qualified authorities relative to the economic outlook for Australian beef do not reflect apprehension as to the future of this commodity. Mr Vincent Fairfax, Chairman of the Stanbroke Pastoral Company (also Chairman of the Australian Mutual Provident Society, with a 51 per cent interest in Stanbroke) in presenting the Stanbroke Directors' Report for the year ending June 1969 commented:

> We remain confident about the long term beef prospects in Australia. However, there are always some problems with the marketing of primary products. As the Chairman of the Australian Meat Board recently stated, the problems involved in the export of Australian meat are mainly 'man made'. It seems inevitable that many of these 'man made' restrictions will, in due course, be modified by pressure from taxpayers and consumers who are either being required by their governments to subsidise local meat production at considerable expense or are having to pay more than is necessary for their meat requirements. The situation facing the Australian meat (and particularly beef) export industry is one requiring the concentrated attention of our Government negotiators in the international trade sphere.[13]

Particular weight can be given to this comment in view of the 30 per cent interest in the Stanbroke Company held by Thos. Borthwick and Sons (Australia) Ltd. This firm has operated large export meatworks in Australia and New Zealand for many years, and has influential world-wide connections in the meat export-import trade.

During a brief visit to Australia in November 1969, Mr R. W. Renneker, an acknowledged world authority on meat production, processing, and marketing, made important comments on the market

[13] Stanbroke Pastoral Co. Pty Ltd, Annual Report and Accounts, 1969.

outlook for Australian beef. The *Sydney Morning Herald*, on 21 November 1969, commented as follows on an interview with Mr Renneker:

> Australians will inevitably find a great market for their high quality meat in the big cities of the Far East.
>
> This is the verdict of Mr R. W. Renneker, top executive of Swift and Company, the world's largest meat handling organisation, President of the company which ranks among the leading 15 of all U.S. industrial corporations.

Reported opinions expressed by Mr Renneker in this interview included the following:

> You will appreciate our company, as a very large supplier of beef in the U.S. domestic market, has special concern in the well-being of American livestock producers . . . On the other hand, we are intensely concerned with the availability and maintenance of supply from Australia, so valuable in the processed meat trade, embracing such popular commodities as hamburgers.
>
> On my journey in Japan, Hong Kong, Singapore and Thailand to Australia, I have been most impressed with the burgeoning tourist trade, especially in their bigger cities.
>
> Australia and N.Z. seem to be the natural sources of good quality beef needed by hotels and restaurants in those countries.
>
> I have a feeling that it is only a matter of time before your livestock economy will be related more and more to the supply of better grades and quality of beef . . .
>
> The concentration of manufacturing meat in the northern cattle regions could be a handicap unless integrated with techniques for raising standards by fertilising the pastures and supplementary feeding.

Mr Renneker's reference to concentration on manufacturing meat in northern cattle regions gives point to a particular difficulty in which four of the five export meatworks in the Kimberleys and Arnhem-N.T. Gulf currently find themselves. On 28 November 1969, the A.M.B. Chief Executive Officer announced that the export licences of the Katherine, Wyndham, Derby, and Broome meatworks had been withdrawn because of their inability to fulfil their obligations under the Meat Board diversification scheme. (Vestey's Darwin meatworks met its diversification obligation.) An Australian Broadcasting Commission

news broadcast, of 29 November, reported the manager of the Katherine meatworks as saying that the works may have to close down. If these meatworks are unable to export to the United States, the result could be disastrous to producers in the Arnhem, N.T. Gulf, Victoria, and Kimberley regions. (In March 1970, the A.M.B. diversification decision was modified to enable the four meatworks to operate in the 1970 slaughtering season.)

Remote region northern cattlemen and meatworks operators know that, including the Centre and limited areas of Barkly regions, the native pastures of the Kimberleys and the Territory lack nutritive capability to fatten cattle at $2\frac{1}{2}$ to $3\frac{1}{2}$ years to a standard of quality appropriate to the Meat Board diversification scheme. This will continue until native pasture deficiencies have been surmounted by improved pastures and irrigated crop fattening, with the addition of grain and other supplements, the effects of which will not be evident for some years hence.

Excepting Kimberley, and northern regions of the Territory, in their diversification difficulty, the weight of informed opinion points to a continuing favourable economic outlook for beef. However, no one has yet spelt out, in specific terms, supporting reasons for this view as regards the export outlook. Neither has anyone well qualified in this field of economics advanced compelling reasons supporting a contrary view.

AMERICAN BEEF INSPECTION REGULATIONS

If, for any reason, the United States prohibited the import of Territory and Kimberley beef the effect on development in these regions would be disastrous. This possibility points up the crucial need of meticulous regard of the meat inspection section of the Commonwealth Department of Primary Industry for strict observance of United States Department of Agriculture requirements concerning importation of Australian meat.

The uncertainty of the future of Territory and Kimberley beef export is emphasised by the following sequence of events.

On 17 September 1970 the Wyndham meatworks became the twenty-seventh Australian meatworks to be struck off the list of those able to export to the United States.

On 29 September Dr Patterson made the following reference in a House of Representatives debate to the delisting of the Wyndham meatworks:

> There seems to be great difficulty in getting from the Americans some type of a standard which can be applied to Australian abattoirs and meat works and which can be interpreted by our meat inspectors and veterinarians in the same way as the Americans do. We are faced with the political problem in America and it is no good underestimating it. There is a powerful meat lobby in the United States . . . the most important aspect of this problem is that there has to be some agreement with the United States as to reasonable standards of hygiene and we must ensure that all licensed exporters adhere to those standards. Secondly, I think it is essential that some consideration be given to exempting the Wyndham, Derby, Broome and Katherine meat works from the Australian Meat Board's diversification requirements for a reasonable period, say, to 1975. Thirdly, there should be on the Australian Meat Board a beef producer representing the Northern Territory and the Kimberleys. The other point is that because of the diversification problem meat works in the north are often forced to purchase unused entitlements of southern Australian meat works at something like 5c per lb. Of course, this must have the effect of reducing the price of cattle offered in the north . . .

In reply, the Minister for Primary Industry, Mr Anthony, said:

> Immediately the meat works at Wyndham . . . was struck off I had discussions with the Americans. It was agreed that a senior veterinary officer . . . would fly out immediately from America and, with one of my own senior officers from Canberra, would go to Wyndham to inspect the works. This inspection is taking place today. I hope to have a report on it by the end of the week. I appreciate the importance of this meat works being kept in existence . . . if it cannot come up to the required standards then something has to be done to improve those standards so that the producers in that area will have access to a works to dispose of their cattle. If they have not that access then a very serious problem is posed for them . . . Between now and next year the company and the Western Australian Government have an obligation to see what they can do to ensure that this works can be brought up to the standard required by the Americans if it has not passed the examination that has been undertaken in the last 2 days.[14]

On 13 October the *Australian* reported that Broome, Derby, Wyndham, Darwin, and Katherine meatworks had lost their licences to export to the United States.

On 15 October Dr Patterson referred, in the House of Representatives,

[14] *C.P.D.*, Vol. 2, H. of R., pp. 1835-7, 29 Sept. 1970.

as a Matter of Public Importance, to 'The Failure of the Federal Government to take positive action to halt the seriously deteriorating condition of Australia's export trade with the United States'. Dr Patterson said:

> Australia's $250m. annual export trade with the United States is threatened by incredible bungling, incompetence and intrigue. Either the United States is bowing to organised political pressure and deliberately adopting practices to inhibit and frustrate Australian meat exports or else the Australian Government is guilty of gross neglect in being incapable of understanding, interpreting and implementing United States meat inspection standards . . . An intolerable situation has arisen in which an increasing number of important meat works are being removed from the American export list on the flimsiest of excuses without any known protest by the Federal Government. . .
>
> Reports from Washington show that United States inspectors in Australia do not always accept the credibility of Australian meat inspectors. If the United States claim is correct — and I say if it is correct — the blame for the present fiasco must be borne by the Federal Government. There is no excuse for continuous technical misinterpretations by Australia, which have now cost 27 meat works throughout Australia their export licences.

Replying, the Minister for the Interior, Mr Nixon, said:

> We also need to know where the responsibility lies for the implementation of the regulations on health in these abattoirs. The first thing that needs to be made perfectly clear is simply that the Australian Government does not control the health regulations covering the entry of meat into the United States. This is within the purview of the Wholesome Meat Act which was brought down by the United States Congress and lays down the regulations and conditions covering the entry of meat into America . . .
>
> The truth is that the United States is not making any demand on Australian abattoirs that it is not making on other exporters to the United States market, such as New Zealand, or indeed on United States domestic abattoirs. . . .
>
> The Government's role is to provide an inspection service covering the meat that is exported to the United States and other markets. This service gives a certification that the meat is prepared and packed in accordance with the requirements of United States legislation . . .
>
> The United States market is a very valuable one. Last year 245,000 tons of beef and mutton valued at more than $240m. was sent to the United States. This represented 70 per cent of our total beef exports. The one thing we cannot afford to do is to jeopardise that market. . . .
>
> We are trying to get proper communication between the meat inspection service, the abattoir controls and the United States authorities so that there

will not be any misunderstandings and so that meat can be killed under proper regulations and sent to the American market.[15]

On 16 October, the *Sydney Morning Herald* published an article by W. B. Bailey-Tart ('On the Land' editor), under the heading — 'U.S. Moves May Hit Aust. Cattlemen', which said:

> Political moves in the US to force the thawing-out and inspection of countries not meeting American inspection standards have aroused fears concerning the future of our $250m. meat export trade with the United States.
>
> This disquiet has nullified guarded optimism on the possibility of Australia getting a higher meat quota from the US in 1971 . . .
>
> Australian exporters fear that the US Administration's anxiety to forward its policy of improving relations with South American countries through trade, especially by taking more of their meat, will declare imports from those countries equal to those standards.
>
> Just as easily, it could say that Australian meat did not meet requirements. This has been the policy of recent months and it has greatly alarmed cattlemen throughout Australia. . . .

These events justify the apprehensions of beef producers and exporters regarding the future of trade with the United States, on which northern development so heavily depends, and highlight the responsibility of Commonwealth authorities to ensure that both meatworks and meat certification conform with United States requirements. It may well be that fault is not altogether with the United States in the delicensing of meatworks.

It is my opinion that if the Commonwealth government can reach clear and unambiguous agreement with the United States as to reasonable requirements regarding the slaughtering, processing, and storing of meat for export, and take positive action to ensure conformity with such requirements, Australia's present share of the American demand for beef of manufacturing quality will remain secure for as long as it is prudent to forecast — say the next ten years.[16]

[15] *C.P.D.*, Vol. 70, H. of R., pp. 2201, 2203-4, 15 Oct. 1970.

[16] Since this was written the A.M.B. Thirty-fifth Annual Report for 1970 has been released. The crucial importance to accelerated beef industry development in northern Australia of preservation of the American market for beef of manufacturing quality is epitomised in Table 32(e) which reveals that America accounted for 76·87 per cent of the total value of Australia's beef and veal export for the year ended June 1970.

7

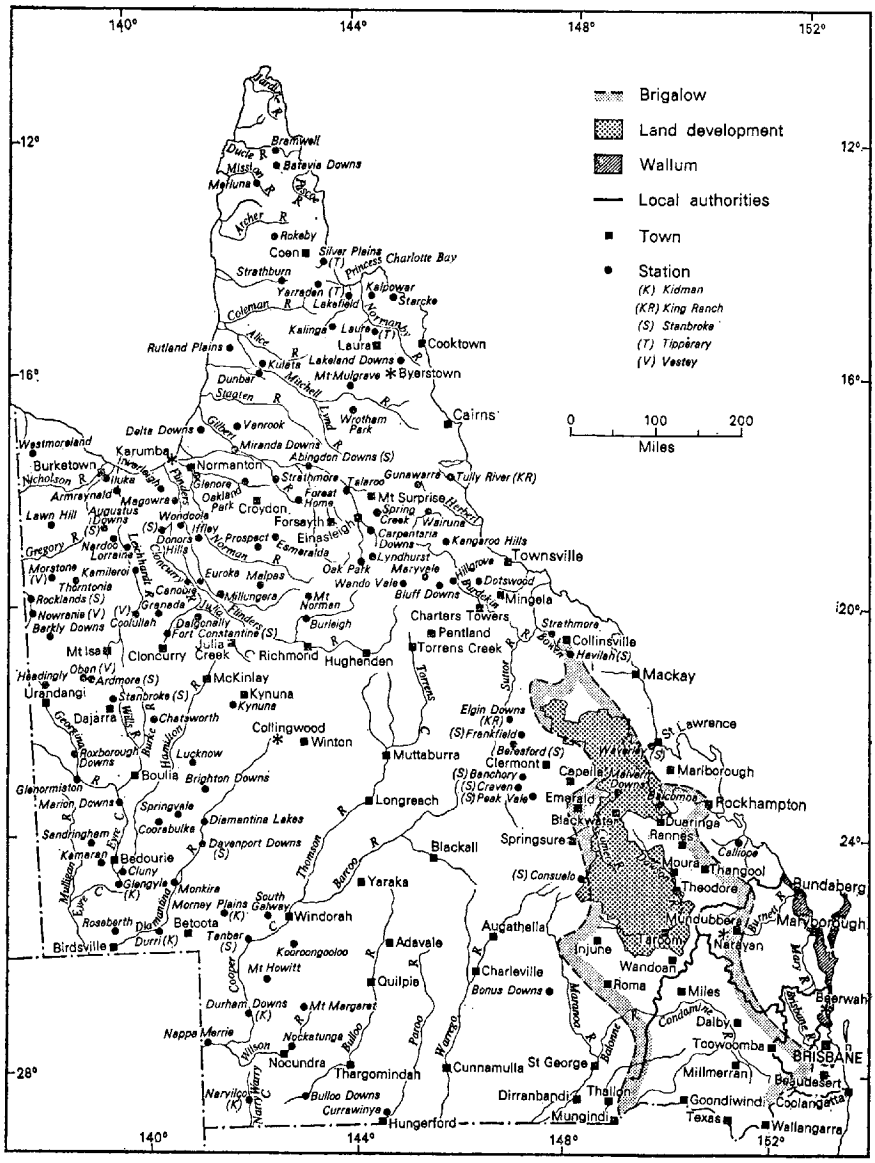
PASTURE IMPROVEMENT IN QUEENSLAND

LAND occupation and utilisation policies of the Queensland government, related to development of pastoral and agricultural industry in the inside regions, have always been oriented towards progressive closer settlement, favouring the resident occupier. The majority of the cattle holdings in these regions are held by resident occupiers, in areas of small to moderate size. Very large holdings are the exception rather than the rule. Absentee landholding is not a major problem. Many of the holdings are below the level of my estimate of efficient productive size.

A survey of the Queensland beef cattle industry by Mr C. Keating of the B.A.E., covering the period 1962/63 to 1964/65, recorded cattle numbers for Coastal-Central, Coastal-North and Coastal-South divisions (approximating Brigalow-Qld Coast regions) as averaging 3·17m. — approximately half the State average. The number of beef cattle holdings in the three divisions (compiled from Queensland Statistical Bulletin No. 3, for 1959-60) totalled 6,486; the average cattle number per holding was approximately 490.[1]

Returns and costs on 'sample' cattle properties in these three divisions, for the three-year period, averaged $A50,673 and $A27,358 respectively; costs represented 54 per cent of returns. The rate of return

[1] *Quart. Rev. Agric. Econ.*, Vol. XX, No. 4, Table 1, p. 192, Oct. 1967.



MAP 5 *Queensland*

on capital was shown as: Coastal-Central, 4·7 per cent; Coastal-North, 9 per cent; Coastal-South, 9·6 per cent. (Beef cattle represented 51 per cent, 67 per cent, and 43 per cent of total capital for the respective divisions.)

In the wallum (map 5), the results of CSIRO work at Beerwah Research Station were being actively translated into farm-scale practice on an adjacent property (Caloundra Downs) of 17 square miles. One million dollars has been committed to development of the total area of this property, of which 8 square miles were cleared and 4·7 square miles sown to a high cattle-carrying mixture of tropical legumes and grasses during four years of development to 1968. The holders proposed to clear and sow more than 16 square miles, allowing a further four years to complete the project. The anticipated carrying capacity of the improved pasture, based on actual results, is an average of a grown beast to an acre. The estimated beast-area cost of pasture improvement is approximately $A80, including $A33 per acre for initial lime and fertiliser input, seed and drilling. With the addition of fencing, buildings, yards, and water supplies, the total beast-area cost will not exceed $A100.

The holders expect to carry 3,000-4,000 breeders by 1970, with 80 per cent calf survival to yearling age. The age of progeny turn-off is expected to be 12 to 18 months. Per acre beef yield and overall profitability would be substantially higher if the pasture resources were utilised mainly for fattening stores, but store cattle are not presently available for purchase at a price which would yield a reasonable fattening profit margin. Consequently, the enterprise will be mainly one of breeding and fattening, with the fattening of weaner-age stores when available at satisfactory purchase price.

This demonstration is of particular importance because, of an estimated 1,406 square miles of wallum country suitable for subdivision and settlement, approximately 900 square miles are suitable for similar treatment and capable of a similar carrying capacity — a beast to an acre of well-established, regularly and adequately fertilised improved pastures. The title of the 17 square mile holding is thirty-year lease. Initially, 8 square miles may be converted to freehold, at a modest purchase price, subject to the performance of firm improvement

conditions to the satisfaction of the Minister for Lands. This had been done by 1968 and the way was then open to convert the remainder to freehold, subject to fulfilment of similar conditions.

In the Gympie-Kandanga area, somewhat to the north-west there are many thousands of acres, in a 45-inch rainfall zone, suitable for intensive development, if improved with tropical legumes and appropriate grasses the capability of which has been abundantly demonstrated on one particular property. This is a 15 square mile freehold, of undulating to hilly country 40 miles west from Gympie.

Up to 1968, 3 square miles had been pasture improved, to a year-round safe carrying capacity of a breeder to 2 acres. The program is to sow a total of 8 square miles (all the suitable country) to improved pasture, giving the holding an average capacity of 4,500 head of mixed cattle. Careful accounting showed a substantial profit on operations to 1968, with every prospect of a satisfactory rate of return on capital and management at full development.

Further to the north, in the Gladstone district, two examples indicate Townsville stylo capability this far south, with possibilities extending still farther to the south. The first is Rodds Bay, 20 miles south of Gladstone, a holding of 22 square miles of which 16·4 square miles are freehold. This holding was chosen by CSIRO in 1944 for the start of a research program for the improvement of speargrass areas which has since extended to speargrass country throughout eastern Queensland. Here extensive trials have demonstrated a carrying capacity of a beast to 3 acres on Townsville stylo, fertilised annually with 1 cwt of superphosphate per acre.

The second related to a group of properties comprising Calliope (a well known Hereford stud) situated a little to the west of Gladstone, Calliungal and Rannes to the south-west, and Balcomba to the north-west of Rockhampton. Over a ten-year period to 1965, an annual average of 1·5 square miles of Townsville stylo was sown. In 1965, 9 square miles were serially sown, bringing the total to 25 square miles. In 1968, 750 tons of superphosphate, at approximately 1 cwt per acre, were used. In the opinion of the holders of this group of properties (a resident family organisation), their pasture improvement results suggest that central Queensland has more to gain from this form of development than from

any other form of property improvement, assuming timber has been cleared and fencing and water facilities are adequate.[2]

In the vicinity of Marlborough to the north-west of Rockhampton, the Queensland Department of Primary Industries has established an important Townsville stylo grazing trial, in co-operation with the holders of Lowville, a cattle property 12 miles south of Marlborough with a 32-inch rainfall. The object of this trial was to demonstrate the benefits obtainable from establishing Townsville stylo in the eastern speargrass country.

Still further to the north, the Department of Primary Industries established a Cattle Research Station, Swan's Lagoon, about 40 miles south-west of Ayr, in 1960. Results obtained in a variety of Townsville stylo grazing trials confirmed those of the Lowville trials.

The CSIRO Division of Tropical Pastures established the Townsville Pastoral Research Laboratory in 1962. A 12 square mile cattle station, Landsdown, situated 30 miles south of Townsville in speargrass country, was purchased for the establishment of a field research station with the object of demonstrating higher cattle productivity through pasture improvement with fertilised Townsville stylo. The carrying capacity of the undeveloped country was about a breeder to 20 acres, with calf survival to weaner age as low as 50 per cent. Bullocks fattened to carcass weight of 550 lb at 4 to 5 years.

Grazing experiments on Townsville stylo-speargrass pastures, using breeding cows and fattening steers, were begun in 1964-5. Except in 1967-8, rainfall was below average; in 1965-6, less than half the average. An experiment with breeding cows compared three rates of superphosphate (nil, 1 cwt, and 3 cwt per acre per annum) and two stocking rates (one cow to 3 and one to 6 acres) with all combinations of each.

Best results were obtained from cows stocked at a beast to 6 acres fertilised with 3 cwt superphosphate per acre. Calf survival to weaner age was 92 per cent, with average live weight of 440 lb at 6 months. Similar results were obtained at the 1 cwt level excepting that the calf survival percentage was lower at 75.

[2] *Calliope Tropical Herefords*, booklet issued in 1967 by Wilson and McDouall, proprietors of Calliope Hereford Stud. See also *Better Pastures More Beef*, booklet issued by ACF Shirleys Fertilizers Ltd, 1968.

An experiment with fattening steers stocked at a rate of one to 2 and one to 4 acres showed that at 28 months those on unfertilised pasture averaged 860 lb while those on fertilised pasture averaged 1,110 lb liveweight (600 lb carcass weight).

These trials and experiments compellingly demonstrate that an average carrying capacity of a beast to 4 acres on properly established and adequately fertilised Townsville stylo is possible throughout that part of Queensland's eastern speargrass country (Brigalow-Qld Coast regions) with an average annual rainfall of 25 inches or higher.

Acknowledging that the attitude of graziers in areas of these regions is more enterprising than that of their counterparts in the remote northern regions of similar capability, it must still be acknowledged that the surface of this capability has barely yet been scratched. But the evidence of numerous examples of successful individual pasture improving enterprise obtained in my 1967-9 survey of inside regions indicates that this part of the beef potential will be achieved before 1990.

THE KING RANCH DEVELOPMENT

A significant contribution to increased beef production in Brigalow-Qld Coast regions is currently being made by King Ranch Development Company Pty Ltd — an association of leading Australian financial interests with the R. J. Kleberg interests of Texas (founders of the Santa Gertrudis breed of cattle).

This company, which is intensively developing cattle breeding and fattening properties in the Queensland Central Highlands and a fattening property in the heavily forested, northern coastal Tully River area, may well claim to have pioneered large-scale clearing of 'gidgee' scrub (*Cambagei* spp.), in the Central Highlands. Up to 1969, a total of 172 square miles of scrub land has been cleared, on which 97 square miles of improved pastures have been established. These developments have resulted in substantially increased cattle-carrying capacity and turn-off, as will be seen in the following examples of King Ranch enterprise.

Central Highlands-Brigalow region: Elgin Downs Station, a leasehold of 127 square miles, is a sound breeding and fattening property with native

pasture cattle capacity of 2,700, at a beast to 30 acres (before scrub clearance). The total area of gidgee scrub — 41 square miles — has been cleared and the land sown with buffel, green panic, and Rhodes grasses.

The scrub-cleared area now averages a beast to 15 acres — 1,730 head. The costs of this development include:

Scrub clearing and grassing (40·6 square miles)		$A91,000
Fencing (58 miles at $A380)		$A27,840
Water supply: 9 ground tanks (100,000 cu. yd.)	$A12,000	
above-ground equipment	$A9,000	$A21,000
Total		$A139,840
Cost per beast-area		$A80.82c

Northern Coastal-Qld Coast region: Tully River Station is an area of about 80 square miles of heavily forested land in the Tully River district, convertible to freehold subject to property improvements being effected to the satisfaction of the Queensland Lands Administration Commission. Development is aimed at intensive fattening of store cattle, either purchased or imported from integrated breeding properties. The only breeding is of Santa Gertrudis stud cattle, from which a number of Santa Gertrudis-cross bulls have already been sold. (This stud is well placed to meet growing demands for the Santa Gertrudis breed in North Queensland.)

The property has been developed in two stages for freeholding, at a total cost (to June 1969) approximating $A2m. The first of 50 square miles at $A42·65 per acre; the second of 28 square miles at $A38. The conditions of freeholding have been fulfilled. At a beast to 2 acres, the beast-area cost of structural and pasture improvement is approximately $A85.

King Ranch Development Company Pty Ltd pioneered large-scale tropical land development in Australia for beef production on Tully River Station. The potential of the Tully River area of high and reliable rainfall was recognised by King Ranch management and expectations in 1963 have been more than realised. Cattle numbers exceeded 20,000 by

1970; with further pasture improvement and suitable fertiliser top-dressing this could increase to 25,000 head by 1975.

In planning this project, King Ranch considered that for it to be successful it had to be integrated into the King Ranch group of properties. A large amount of capital was required and as investment in heavy machinery would be high, a reasonably large area was necessary to spread high fixed costs. The area had to be suitable for intensive pasture production; it had to be located with ready access to rail so as to tap areas breeding store steers, and there had to be an outlet for the finished beef produced for export — namely through the modern Townsville meatworks.

The carrying capacity and turn-off of integrated breeding properties would be increased significantly if store steers could be turned-off at a younger age, thus providing grazing for a higher proportion of breeders. The higher level of turn-off could be maintained, with the knowledge of a secure area being available to agist breeders in times of drought.

The key to maximum production on Tully is the maintenance of correct pasture balance. The basic legume for the area is stylo. It is vigorous growing, with high protein content, suitable for a wide range of soil types and moisture conditions. Puero, likewise, is an important legume because of its high nitrogen fixation capability, giving greater stimulation to associated grasses which, otherwise, would be less palatable in the summer months of prolific growth.

From 1969 on, as stocking is increased, the beast-area cost will commensurately diminish. It is quite conceivable that pastures fattening one beast to the acre on the better soils could, eventually, be maintained at that level over the whole area. The management's present thinking, however, is in terms of a beast to 2 acres.

The King Ranch achievement in establishing the economic feasibility of developing this heavily forested, high rainfall country of northern coastal Queensland is a notable pioneering contribution to high-density beef cattle fattening. It bears out a long held belief of the Queensland Department of Primary Industries in the viability of this form of production, based on the experience of grazing trials at its own South Johnstone Experiment Station, on the one hand, and of the CSIRO Division of Tropical Pastures on the other. It should set the pattern for

future development of a significant area of high beef production potential in this environment where, previously, there was marked reluctance to undertake development on this scale.

In the light of results achieved over its relatively short history, the future of the King Ranch Tully project could be:

that the medium-term, on-station price of fattened cattle will average $A130;
that steers of medium-to-forward store condition would, on the average, fatten in less than twelve months;
that average operating costs would not exceed 50 per cent of on-station returns (breeding and fattening basis);
that on the basis of present price-cost relationship, the rate of return, at full development (say 1973), on a total investment of $A2·5m. would be of the order of 20 per cent.

DEVELOPMENT OF BRIGALOW LANDS

Of the estimated 14·9m. cattle potential of Brigalow-Qld Coast regions, approximately 27 per cent is related to the brigalow areas, largely in the Fitzroy basin of central Queensland, the high fertility of which has been recognised early in this century. The Queensland Lands Administration Commission expressed an opinion, in 1967, that 'it is the largest area of underdeveloped fertile land in the Commonwealth; that its full development will be of lasting benefit to the State and the Commonwealth'.[3]

In 1962, an intensive brigalow land development program now embracing 17,500 square miles, with a large extent of brigalow and associated scrub country, was inaugurated by the Queensland government with the aid of a special Commonwealth loan of $A23m., repayable by 1995.

The present brigalow development scheme is, in my opinion, the best based Australian land settlement scheme in this century. Initially, the economics of the proposal were thoroughly investigated by the B.A.E., in collaboration with the Queensland Department of Primary Industries. The decision of the Commonwealth to aid substantially in the financing of the scheme was largely influenced by the B.A.E. evaluation, reported in detail in its published report of December 1963.[4] The B.A.E. con-

[3] Queensland Department of Lands, *A Résumé of the Fitzroy Basin Brigalow Land Development Scheme*. Department of Lands, Brisbane, Dec. 1967 (mimeo.).

[4] *The Economics of Brigalow Land Development in the Fitzroy Basin of Queensland*, B.A.E., Canberra, 1963.

cluded that development of the three areas involved in the brigalow land development scheme would be a sound economic proposition.

The scheme covers three areas extending from Wandoan in the south to Nebo in the north. Areas 1 and 2, of 7,812 square miles, providing for 254 blocks comprising 101 blocks for allotment by ballot, 38 for sale by auction, and 115 as retention areas for existing landholders. Area 3 (to the north of the Rockhampton-Emerald railway), of 9,688 square miles, provides for 355 blocks comprising 91 for allotment by ballot, 39 for sale at auction, and 225 as retention areas for existing landholders.

The general plan of development provided that:

> Each existing leaseholder be offered a new title in respect of his retention area under conditions requiring development of the block to minimum standards without the provision of financial assistance by the State from moneys provided for ballotees under the scheme.
>
> Not less than one-quarter of the number of remaining blocks, containing not more than 10,000 acres, to be offered for sale at auction by the State for conditional purchase in their then state of development under conditions requiring development to minimum standards without the provision of financial assistance by the State from moneys provided under the scheme.
>
> The number of blocks remaining, after provision of retention areas and blocks for sale at auction, be allotted, under conditions requiring development to minimum standards laid down by the State, to applicants to be selected in accordance with procedures determined by the State.
>
> Each person who is allotted a block containing not more than 10,000 acres to have the right to a conditional purchase of the block, with the proviso that the Deed of Grant will not issue until the block has been developed to the minimum standards referred to above and all amounts owing by him to the State in respect of the block have been paid.[5]

The actual implementation of the scheme is entrusted to the Corporation of the Land Administration Commission whose Chairman is the Chief Commissioner of Lands. The Corporation receives technical assistance and advice from the Department of Primary Industries.

The lands, which came into the hands of the Land Administration Commission as a result of negotiations with existing leaseholders for surrender of portions of their holdings, were then divided into units capable of running, when fully developed to pasture, 800-1,000 head of

[5] *Brigalow Land Development Scheme*, pp. 1, 2.

grown cattle. This carrying capacity was very conservatively estimated without regard to extensive cropping for which large areas of the blocks are suitable.

Approximately 75 per cent of the blocks remaining after provision for retention areas were made available under the selective method of application either as purchase leases or grazing homesteads. Where there was more than one qualified applicant for a block, the successful applicant was determined by ballot. Approximately 25 per cent of the available blocks were sold at public auction under a conditional purchase tenure by which the purchaser, upon fulfilment of improvement conditions and the payment of the purchasing price, obtains freehold title over the land.

No monies are available from the Corporation of the Lands Administration Commission for the development of blocks sold at auction. The purchasers of those blocks must rely on finance obtained from other sources.

The allottees of blocks opened at ballot can obtain finance from the Lands Administration Commission, to the limit of $A60,000 for:

the clearing of timber undergrowth and maintaining the block free of regrowth and suckers;
the establishment of sown pastures;
the provision of fencing;
the provision of cattle tick control units;
the provision of water facilities;
the provision of breeding cattle; and
the cultivation of suitable areas.

Eligibility to participate in a ballot under the scheme is governed by special qualifications and conditions of application. Neither females nor joint applicants are eligible.

The purchase prices paid at the auction of 37 blocks, exclusive of survey fee and the value of existing improvements, indicated a very keen public demand. The upset purchase price averaged $A28,577 per block; the price realised at auction averaged $A66,933, more than double the upset price.

The holding of the blocks purchased at auction was also governed by firm timber treatment and structural improvement conditions. Neither a

corporation nor a trustee was eligible to buy. A bidder could not purchase more than one block. A block is subject to the condition of occupation during the period of five years commencing from the date of sale. The full purchase price is required to be paid in ten years, at 5 per cent interest on outstanding balance.

One of the most important features of the brigalow development scheme is the adequacy of the size of the holdings (varying between approximately 8 and 40 square miles according to the class of country). This is in strong contrast to previous government sponsored closer settlement schemes in Queensland and elsewhere. At full development, supported by effective fodder conservation (grain, silage and other forms), the blocks are capable of carrying substantially more than the estimated 800-1,000 grown cattle. Double that number would not be an over-estimate.

I observed numerous examples of rapid farm development in 1968, indicating the high levels of productivity of which the brigalow is capable under conditions of adequate farm improvement and efficient management. One such example was a purchase lease, of 9 square miles, alloted by ballot at a purchase price of $A22,000. A total of 8·4 square miles of scrub had been pulled down and burnt, of which 6 square miles had been sown with a mixture of grasses. Grain and fodder crops had been cultivated on 2·5 square miles. One thousand head of mixed cattle were then being carried. I estimated carrying capacity, at full development, at 2,000 head on a breeding and fattening basis, with 85 per cent calf survival to weaner-yearling age, turning-off mainly vealers and yearlings. The holder estimated land preparation and structural improvement cost, at full development, as follows:

Clearing, land preparation, grassing	$A100,000
Fencing	8,800
Water supplies	22,000
Yard with dipping facility	3,200
Buildings (excluding homestead)	19,000
Freeholding price	22,000
Total	175,000

Cost per beast-area, $A87; per acre, $A30

In this example, areas are cultivated for grain (wheat and grain sorghum) in combination with beef production. As well as providing ready cash income and a stockfeed reserve for use in adverse seasons, cultivation is effective in controlling brigalow regrowth, which occurs for some years after initial clearing.

Problems of farm development in this environment include control of brigalow regrowth, avoidance of soil erosion, and maintenance of soil fertility. These and other problems are under continuous study at the centrally situated Brigalow Research Station operated by the Queensland Department of Primary Industries, through which extension services are available to settlers.

The CSIRO Division of Tropical Pastures has assumed an important research role, related to crops and pastures and beef production in brigalow and associated types of country. A research station was established in August 1966, on a property acquired for the purpose, situated to the west of Munduberra in a 28-inch rainfall zone. This is Narayan of 35 square miles, of which 23 square miles are suitable for development by timber clearing, pasture seeding, and cropping. About 8 square miles consist of brigalow-bottle tree scrubland — of which about 4 square miles have been cleared — of a type common to the Wandoan-Moura-Banana brigalow country.

The brigalow is characterised by vegetation in which this leguminous tree is conspicuous. There are scattered outliers but the region occupied by brigalow forests lies mainly between latitudes 20°S and 29°S (some 700 miles) and terminates more or less on the border between Queensland and New South Wales. To the east and west, the region is bounded approximately by the 30 and 20 inch isohyets of mean annual rainfall. Within this general area of about 40,000 square miles there is a mosaic of soils differing sharply in fertility, with brigalow occupying clay soils of moderate to high fertility on some 19,000 square miles. The remainder is largely occupied by Eucalypt forests and woodlands on infertile soils where plant growth is limited by physical conditions as well as by nutrient deficiencies. The third important unit of landscape is an area of about 4,700 square miles of rolling grasslands on deep cracking clay soils ('black earths') of high fertility towards the northern end of the brigalow region.

The brigalow lands in their original state have a carrying capacity of about 1 beast to 50 acres, their high fertility being offset by the poor growth of herbs under the very dense tree layer. Total replacement of the original vegetation is essential for effective animal production from pastures and there are problems of woody regrowth following tree felling and burning. The brigalow lands will support pastures without the use of fertiliser for at least ten years. The combination of fertile soils with the need for total replacement of vegetation has led to the situation where the brigalow region contained 2,600 square miles out of the total area of 5,600 square miles of sown pasture in Queensland in 1968.

The Central Downlands are mainly grasslands with a much higher carrying capacity (about 1 beast to 10 acres) and are more or less free of timber so that there are no problems of regrowth. The soils, while being at least as fertile as those of the brigalow, are more prone to erosion and this factor in land development is accentuated by the high intensity of much of the rainfall. For convenience the region is divided geographically into three units called respectively the southern, central, and northern brigalow (map 5).

Research, trial, and experiment at Narayan are of large scale and comprehensive nature, covering speargrass and brigalow country. The Division of Tropical Pastures is confident that results obtained there can be replicated in areas to the north, south, and west.

In a résumé of brigalow land development of 31 December 1967, the Queensland Lands Department concluded:

> This Scheme, in its overall aspect is a splendid example of what may be expected from a combination of vision and practical help by the Commonwealth from the national point of view, and energy and courage on the part of the State authorities who are carrying the responsibility for the time being for the administration of the Scheme and development of the State of Queensland.
>
> When development in [this] area nears completion it might well be that the State will proceed with development of other areas.[6]

In my opinion, this scheme provides a practical model for the

[6] Ibid., p. 11. See also *The Brigalow Story*, Lands Administration Commission, Department of Lands, Brisbane, Dec. 1968.

planning of development of the pasture improvable areas of the Arnhem and Peninsular regions.

The philosophy of Queensland's public estate administration in maintaining priority of the public interest over that of private interests provides a model for governments of the Commonwealth in respect of the Northern Territory, and Western Australia in respect of the Kimberleys, to follow in their planning for the future of beef in northern Australia.

8

INVESTMENT AND MANAGEMENT

IN my 1967 survey I found in those parts of remote regions lacking (on present technology) significant pasture improvement capability, abundant evidence of the willingness of some station holders to invest in station structural improvements to levels essential to achievement of the cattle potential, and to establish economic feasibility, given present cattle price-operating cost relationship. This is illustrated in the following examples, fairly representative of the 1967 survey holdings:

Example A. This is a holding of 261 square miles located in the eastern highlands of Queensland Gulf region, in a 23-inch rainfall area, of poor country unsuitable for fattening cattle on native pastures. It is operated mainly as a breeding property, integrated with two fattening properties of 50 and 86 square miles in the Charters Towers district. The average native pasture cattle-carrying capacity of the breeding property is of 3,500 head (mainly breeders), at one to approximately 50 acres. Males and culled heifers, of weaner age, are turned-off to the fattening properties. The total number of cattle carried on the three properties varies between 7,000 and 8,000. The enterprise is operated by a father-son partnership.

Existing and needed station structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	90 miles	36,000	100 miles	54,000	90,000
Waters	32 dams	30,000			30,000
Stockyards		16,000			16,000
Buildings		31,000			31,000
Internal roads		1,000			1,000
Airstrip		2,000			2,000
Total		116,000		54,000	170,000

Beast-area cost: present, $A33; needed, $A15; total, $A48

Despite the relatively low rainfall, this holder, in collaboration with the CSIRO Division of Tropical Pastures at Townsville Laboratory, has undertaken intensive, superphosphate fertilised Townsville stylo trials, on cleared land and in open timber, with the object of testing whether the country can be improved to breeding and fattening quality and substantially increased carrying capacity. Despite adverse conditions due to less than average rainfall in the 1965-7 period of the trial, the results were sufficiently promising to warrant extension of the sowing. Adequate timber clearing, earth moving, and other equipment was acquired in order thoroughly to test the economic possibilities of large-scale Townsville stylo development.

Results obtained to 1969, using annual topdressing with one cwt of superphosphate per acre, indicate year-round carrying capacity of a breeder to 8 acres. The importance of this trial, in an area previously thought to lack significant Townsville stylo capability because of inadequate rainfall, is that if it proves successful, more thousands of square miles may be brought within the scope of economic Townsville stylo development. But clearing is most important. Results with superphosphate are only really worth while if native vegetation is first cleared away, except for shade trees.

Because of nutritional deficiencies in the native pastures of this holding during the critical July-December period, the percentage of calf survival is of a low order of 50-55 per 100 breeders joined, and breeder mortality is higher than 10 per cent. The five-year experience to 1969 indicates that in addition to a fairly safe Townsville stylo carrying

capacity of a breeder to 8 acres, the calf survival to yearling age will rise to as high as 80 per cent. This is of the highest significance, for in the context of economic feasibility of Townsville stylo development an important point is the percentage of calf survival to an age of more than one year.

Example B. This is a holding of 245 square miles located on the Leichhardt River in the western part of Queensland Gulf region, in a 20-inch average annual rainfall area, used for breeding and fattening. It is operated by a resident family partnership, the members of which have a lifetime of experience in the environment. The average carrying capacity is 5,000 head at a beast to 31 acres.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	88 miles	27,000			27,000
Waters	8 bores	38,000			38,000
Stockyards		12,000		8,000	20,000
Buildings		60,000			60,000
Internal roads		1,000			1,000
Airstrip		1,000			1,000
Total		139,000		8,000	147,000

Beast-area cost: present, $A28; needed, $A2; total, $A30

Example C. This is a holding of 1,440 square miles located on the Georgina River, south-west of Boulia, in the Channel region of high class fattening quality best suited to fattening purchased store cattle, operated by a resident occupier. The average annual rainfall is 7 inches — near Australia's lowest. The fattening quality of Channel country pastures derives from the abundance of highly nutritious herbage that follows periodical flooding in the river systems. The average cattle-carrying capacity is 6,000 head at a fattening age beast to 150 acres. I estimate the overall Channel country carrying capacity at a beast to 160 acres.

This leasehold has been occupied by the present holder since 1939. Starting with limited capital, development of the holding has been largely financed from surplus earnings from cattle sales. Despite

fluctuating seasonal and flood conditions, including the prolonged 1958-66 drought, cattle losses were minimal.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	171 miles	68,000	60 miles	30,000	98,000
Waters	7 bores 5 tanks	52,000	3 (artesian)	49,000	101,000
Stockyards		10,000			10,000
Buildings		66,000			66,000
Internal Roads		500			
Airstrip		1,500			2,000
Total		198,000		79,000	277,000

Beast-area cost: present, $A33; needed, $A13; total, $A46

Example D. This is a holding of 911 square miles located in Centre region, north-west of Alice Springs, in a 10-inch average annual rainfall area, used for breeding and fattening. It was established as a father-son resident partnership. The average carrying capacity is 5,000 head, at a beast to approximately 120 acres, in a range of 3,000-8,000 according to seasonal conditions. In normal seasons, the calf survival to yearling age is of the order of 70 per 100 breeders joined.

The present purpose is breeding and fattening, to which the country is well suited. But because prolonged droughts are not infrequent, the most suitable purpose, for Centre region, is for the turning-off of males and culled heifers at average yearling age.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	105 miles	42,000	50 miles	20,000	62,000
Waters	10 bores	90,000	4	36,000	126,000
	10 dams	30,000	5	15,000	45,000
Stockyards		34,000		8,000	42,000
Buildings		15,000		28,000	43,000
Internal roads		6,000		3,000	9,000
Airstrip		4,000		2,000	6,000
Total		221,000		112,000	333,000

Beast-area cost: present, $A44; needed, $A22; total, $A66

Despite the severity of the 1958-66 drought, the average annual returns were sufficient to meet interest payments and other operating expenses. At a critical stage of the drought, 1,500 breeders had to be sold in order to avert crippling loss. By 1967, herd numbers had recovered to 3,000 of which 1,300 were active breeders. By skilful management the operators were able to avoid the heavy financial burden of breeder restocking.

Example E. This is a holding of 1,050 square miles located in Victoria region, south-west from Katherine, in a 15-inch rainfall area, operated by a resident holder. The average cattle-carrying capacity is 12,000 head at a beast to approximately 55 acres.

The present use is for breeding and fattening. The most suitable purpose would be for turning-off males and culled heifers at 1½-2 years and fattened cast-for-age breeders.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	128 miles	51,000	75 miles	30,000	81,000
Waters	16 bores	112,000	6	48,000	160,000
Stockyards		19,000		12,000	31,000
Buildings		22,000		4,000	26,000
Internal roads		2,000		1,000	3,000
Airstrip		6,000			6,000
Total		212,000		95,000	307,000

Beast-area cost: present $A18; needed $A8; total, $A26

Example F. This is a holding of 1,250 square miles located in Barkly region, north-east from Tennant Creek in a 12-inch average annual rainfall area, operated by a family partnership resident in Adelaide. The average carrying capacity (60 per cent breeders) is 8,000 head of cattle, at a beast to 100 acres.

The holding is used for the purpose to which it is best suited, namely turning-off males and culled heifers as yearlings. It is integrated with a crop-fattening property in Queensland Central Highlands. Cast-for-age breeders are marketed either as breeders or fats. The young stores are moved by road and rail transport to the fattening property, which is

adjacent to a railway. Calf survival to yearling age averages approximately 70 per 100 breeders joined.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	270 miles	80,000	40 miles	16,000	96,000
Waters	10 bores, 2 tanks, 1 dam	120,000	1	8,000	128,000
Stockyards		25,000			25,000
Buildings		28,000		16,000	44,000
Internal roads		7,000			7,000
Airstrip		1,000			1,000
Total		261,000		40,000	301,000

Beast-area cost: present, $A32; needed, $A5; total, $A37

Although not strictly in the category of resident occupancy this holding may, for all practical purposes, be regarded as such, since it is a vital constituent in an integrated Queensland-Territory breeding and fattening enterprise, closely personally supervised by the senior member of the family partnership.

Example G. This is a holding of 1,540 square miles located in Kimberley region, south-east of Derby, in a 14-inch average annual rainfall area, operated by a resident occupier and used for the purpose of breeding and fattening. The cattle-carrying capacity is 15,000 head at a beast to approximately 65 acres.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing	230 miles	46,000	150 miles	60,000	106,000
Waters	15 bores	45,000	6	42,000	87,000
Stockyards		21,000		8,000	29,000
Buildings		100,000		16,000	116,000
Internal roads		2,000		1,000	3,000
Airstrip		2,000			2,000
Total		216,000		127,000	343,000

Beast-area cost: present, $A14; needed, $A9; total $A23

Example H. This is a holding of 1,460 square miles located in Kimberley region, south-west from Broome, in a 12-inch average rainfall area, used for breeding and fattening, operated by an American manager on behalf of an American investor. The most suitable purpose of production is that for which it was originally used, namely, turning-off males as stores and cast-for-age and culled females as fats. A major difficulty of its use for this purpose is the long distance to southern fattening areas. (The road transport distance to railhead at Meekatharra is more than 700 miles.) The average cattle-carrying capacity is 15,000 head at a beast to approximately 60 acres.

Existing and needed structural improvements are:

	Existing	Value $A	Needed	Cost $A	Total $A
Fencing*	43 miles	12,000	214 miles	75,000	87,000
Waters†	15 bores 10 wells 1 dam	52,000	49	78,000	130,000
Stockyards		11,000		33,000	44,000
Buildings		25,000		43,000	68,000
Internal roads		11,000		4,000	15,000
Airstrip		5,000		2,000	7,000
Total		116,000		235,000	351,000

Beast-area cost: present, $A8; needed, $A16; total, $A24

*Sea coastline forms the long western boundary, considerably reducing the mileage of boundary fencing.

†Sub-surface water is abundantly available at the shallow depth of 45 feet. Windmill, storage tank, and troughing equipments are correspondingly low cost.

THE TASKS OF MANAGEMENT

Because of the relatively advanced state of development, and higher levels of management efficiency, my estimated 15·7m. beef potential of Qld West-Brigalow-Qld Coast region is likely to be achieved in a much shorter time than that of the remote regions of the Territory, the Kimberleys, or Queensland, where levels of development and management are still backward. With the wide range of resources, including advanced scientific technology, available to the Commonwealth, development of the Territory's cattle potential should, by now, be well advanced, serving as an example to Queensland and Western Australia

as to what could be done in development of their remote regions. Instead, the Territory, in 1970 cattle number and turn-off terms, is little further advanced than it was twenty years ago.

On the evidence of the technological feasibility of year-round cattle-carrying capacity of a beast to 3 acres on well-established adequately fertilised Townsville stylo pasture in Territory areas of 30-inch or more average annual rainfall, the question arises as to when and by whom will this be translated into economic farm-scale reality. In this regard, the performance of both private landholders and government in the Territory has been less impressive than in inside areas of Queensland.

In Arnhem and N.T. Gulf regions, excluding Aboriginal reserves, there are 18,750 square miles above the 30-inch rainfall isohyet, estimated to be suitable for Townsville stylo. Within this area, more than 18,750 square miles of pastoral leases, of which approximately 12,500 square miles would be suitable for Townsville stylo, are held by overseas and Australian absentee interests. Most of the absentee holders, particularly those of overseas origin, have sufficient financial resources to undertake large-scale pasture improvement.

Taking Manbulloo Station, of 1,489 square miles, as an example, Perry's pasture map indicates that the greater part of this holding would be suitable for Townsville stylo. The native pasture carrying capacity is estimated at approximately a beast to 160 acres = 6,000 head. Assuming that approximately one-third of the area — 469 square miles — is capable of pasture improvement, it should be capable of carrying (at half the rate considered technically feasible) 50,000 head of cattle, at a beast to 6 acres of Townsville stylo, with the aid of native pasture, and turning-off an annual average of 10,000 head, compared with a present native pasture capacity of 6,000 and 900 respectively.

Having regard to the substantial tax rebate incentives afforded by the Commonwealth, in the deductibility of a large proportion of costs incurred in the establishment and maintenance of improved pastures, covering such items as land clearing and preparation, cultivation and sowing, seed and fertiliser, ground tank and dam construction and well boring for water supply, the capital costs of structural improvements, including homestead and outcamp buildings, fencing, yards, and dips, and above-ground water supply equipment for the development of 468

square miles of improved pasture, would be of the order of $A20 per beast area — $A1m. at full development. Total annual operating expenses would be about $A10 per head of cattle carried. An annual average turn-off of 10,000 head, at on-station price of $A100, less operating expenses, would give a net return of $A500,000.

Taking into account:

Establishment costs	$Am. 1.0
The value of 20,000 breeders at $A70	1.4
Plant, equipment, horses	0.1
Total	2.5

The earning rate on actual investment would be of the order of 20 per cent, which would be adequate considering the risks involved.

The tasks of management in the operation of an enterprise of this magnitude can readily be appreciated, realising that it would cover the maintenance of 1,000 miles of fencing, 70 watering points, 40 drafting and branding yards equipped with dips, and the spreading annually of 7,500 tons of superphosphate, and, in addition, the considerable animal husbandry problems associated with the handling of a herd of such size.

These tasks of management would be difficult enough for a competent resident holder, with adequate financial resources, in the operation of a 10,000 head cattle enterprise which would be of optimum efficient productive size for this environment. It is open to doubt whether a 50,000 head intensive cattle enterprise of this kind could be effectively operated under direction from London, New York, or a city in Texas, with an Australian head office in Sydney or Brisbane, a branch office in Darwin, and supervised by a travelling pastoral superintendent also concerned with the management of other properties.

The *Sydney Morning Herald* of 19 March 1971 reported details of a major development project on Willeroo Station, of 2,262 square miles, adjoining Manbulloo.

The setting apart for application of Willeroo was notified in Commonwealth of Australia Gazette No. 29 of 14 May 1959, at an annual rental of 30 cents per square mile ($678·60, approximately $\frac{1}{3}$ of the wages of one stockman) for the first ten years. Existing improvements were valued at $26,284, to be paid for over a period of twenty years. Leasehold

conditions required the lessee to stock the land with a minimum of three head of cattle to the square mile within ten years and to erect 100 miles of fencing within 15 years. Carrying capacity was estimated at 8,000 head of cattle. The period of the lease was from 1 July 1960 to 30 June 2010. The successful applicants were B. G. L. and G. L. Killen.

The *Herald* reported that a new pastoral company, Northern Agricultural Development Corporation Ltd, had been formed to develop Willeroo. Within five years 300,000 acres will be cleared, 200,000 acres sown to Townsville stylo and 60,000 acres to grain sorghum. The cattle herd will be increased to 80,000 head.

The Arnhem-N.T. Gulf area of Townsville stylo capability is now held in approximately 83:20 proportions by absentee and resident holders. The estimated 200 square miles of Townsville stylo sown to 1969 represents approximately 1·06 per cent of the total capability. Few leaseholders in Arnhem-N.T.-Gulf regions, have so far, manifested willingness to exploit this potentiality. None seems to be in disagreement as to the measure of proof of its technological feasibility afforded by CSIRO and Territory administration research workers, but few seem willing to subject this proof to the test of farm-scale, economic feasibility. Doubtless, all would wish to see such a test applied in farm-scale dimension by the Commonwealth government.

Of the big, overseas controlled holders of large areas suitable for Townsville stylo in Arnhem-N.T. Gulf (with no Australian participation in their shareholding), prominent amongst those with undoubted financial resources to undertake large-scale pasture improvement development are Vestey and the Tipperary Land Corporation. But, so far, neither has provided evidence of intention to undertake pasture improvement on a really large scale.

Vestey's attitude to the development of their vast northern aggregation of cattle holdings was outlined in an interview with the head of the organisation, Lord Samuel Vestey, and the Australasian manager, Mr W. P. M. Griffiths, published in the *Australian Financial Review* on 6 September 1968, from which the following extracts are quoted:

> There has been no official criticism whatever. The fact that no Government has cancelled our leases, speaks volumes for the fact that we run the properties efficiently and well . . .

We run our properties on similar lines to everybody else up there, on the open range system. It is mainly because we are there on such a vast scale that all the criticism and attention is directed at us . . .

The feasibility of pasture regeneration was being investigated. Now that a stable beef market has been in existence for about eight years, much more money was being invested, and this was now running at $650,000-$800,000 a year on such things as fencing, pasture improvement and homesteads.

Currently the company was turning off 11,000 head of cattle in bad years, and about 18,000 in good years.

The company was grazing 150,000-160,000 head of cattle over the total area under its control in northern Australia, amounting to about 20,000 square miles. The return on capital was about 8 per cent.

In the short-term, with pasture improvements it was hoped to build the herd up to about 200,000 head within the next six or seven years.

The average annual turn-off of approximately 11 per cent of average total cattle numbers on native pasture reflects a low level of management efficiency. At a reasonable level, the average would be 16 per cent.

Apart from the highly specialised management skills demanded in the development of a cattle raising enterprise so largely based on improved pasture as in the example given in the Budget (p. 153), the efficiency of cattle station management, at all levels, is no less important than in the operation of a mining, manufacturing, or retailing enterprise. Former attitudes of *laissez faire* in the operation of remote region cattle raising are slowly changing to more progressive attitudes in the application of advanced technology to pasture conservation and improvement, animal breeding and nutrition, cattle handling, and transport. These changes are much more evident in inside than in remote cattle regions.

The term 'efficiency of management', as applied to beef cattle raising, is often used by individuals, lacking practical knowledge of the operation of a cattle station, whose understanding of what the term really means may be unclear. The principal tasks of management in the successful operation of a northern cattle raising enterprise are briefly described as follows:

Structural improvements: the siting, supervision of construction, and maintenance of stock watering points, fencing, cattle yards and dips, and buildings.

Pasture improvement: selection of land suitable for pasture improve-

ment; timber clearance where necessary; land preparation and sowing; regular fertiliser top-dressing; prevention of grassfire.

Pasture management: judgment of stock-carrying capacities of native and improved pastures; avoidance of over-grazing; rotational reservation of pastures to allow for re-seeding and regeneration of vegetation, and as dry season and drought reserve for breeders.

Herd management: recognition of the prime importance of keeping the herd branded up by ensuring, as near as is possible, 100 per cent calf branding; drafting of weaned calves to a weaner paddock, and later to bullock and heifer paddocks; strict culling of heifers for breeder replacement as to type, conformation, constitution, and colour prior to joining; culling of barren cows; segregation for fattening of cast-for-age breeders; drafting of fat or store cattle for market.

Animal husbandry: careful selection of herd bulls by strict rejection of off-types; maintenance of an adequate percentage of bulls to breeders, according to environmental conditions; regulated joining of bulls, and their removal from the breeding herd at the appropriate time, to ensure calf drop at the most favourable pasture period for the breeder; regular weaning of calves in order to relieve breeders of the dual stress of lactation and pregnancy.

Pest and disease control: regular dipping of cattle in areas of tick infestation, and with a preparation suited to act as a buffalo fly repellent where necessary; vaccination of weaners against bovine pleuropneumonia in areas where the disease is endemic; eradication of brumby horses and wild donkeys; persistent trapping, poisoning, and shooting of dingoes.

Labour: judgment of the number and class of employees needed for efficient operation of the enterprise, and maintenance of the workforce at adequate strength.

Plant and equipment: purchase and maintenance of motor vehicles, earthmoving and fire ploughing plant, agricultural implements, workshop equipment and tools, lighting and refrigeration plant, saddlery, harness, etc.

Station stores: purchase and storing of rations, working footwear and clothing, oil and fuel, materials and spare parts for the repair and maintenance of structural improvements, plant and equipment.

Station records: accurate recording of herd particulars, livestock sales and purchases; purchase and disposal of station stores and materials; costs of maintenance and replacement of structural improvements, plant and equipment; depreciation allowances; labour costs and other operational expenses, meticulous care in the recording of items of expenditure which qualify for taxation rebate or deduction.

What flows from this appreciation of the tasks involved in the management of a northern cattle raising enterprise is that there must be a limit to the size of a herd which an individual can manage efficiently and that this can be categorised within the scope of an *efficient productive unit* defined as follows:

> The area of land related to cattle herd size, which, when adequately improved, efficiently managed, and used for the purpose to which it is best suited, is sufficient to constitute an efficient productive unit, capable of producing an adequate average return to the managerial skill and invested capital of a bona fide resident landholder.[1]

My regional estimates of desirable herd sizes in areas which are either non-pasture improvable or mainly improvable, and the approximate number of efficient productive units which fall within this category, are indicated in tables 15 and 16.

Table 15
Regional estimate of cattle holdings of efficient productive size

Region	Non-pasture improvable		Region	Pasture improvable	
	Average herd size	Range		Average herd size	Range
Kimberley	7,000	5,000-10,000	Kimberley-Arnhem-N.T. Gulf-Victoria	10,000	8,000-12,000
Arnhem-N.T. Gulf-Victoria-Peninsular	8,000	6,000-10,000	Peninsular-Qld Gulf	8,000	6,000-10,000
Barkly-Qld Gulf	5,000	4,000- 6,000	Qld West	5,000	4,000- 6,000
Centre	5,000	3,500- 6,000	Brigalow-Qld Coast	2,200	1,500- 5,000
Channel	4,000	3,000- 5,000			

[1] J. H. Kelly, *Report on the Beef Cattle Industry in Northern Australia*, p. 94.

Table 16
Herd size and number of efficient productive beef cattle units

Region	Non-pasture improvable: Potential cattle number head	Average herd size head	No. of units	Region	Pasture improvable: Potential cattle number head	Average herd size head	No. of units
Kimberley	800,000	7,000	114	Kimberley-Arnhem-N.T. Gulf-Peninsular-Qld Gulf	2,400,000	10,000	240
Arnhem-N.T. Gulf-Victoria	700,000	8,000	88		3,200,000	8,000	400
Peninsular	300,000	8,000	38				
Barkly-Qld Gulf-Centre	2,500,000	5,000	500	Brigalow Qld Coast	14,900,000	2,200	6,773
Channel Qld West*	600,000 800,000	4,000	150				
	5,700,000	6,404	890		20,500,000	2,754	7,413
Arnhem†	200,000		25		2,100,000	10,000	210
	5,900,000				22,600,000		7,623

* Cattle carried with sheep in Qld West region.
† Included in Arnhem-Daly River-Beswick Aboriginal reserves.

The Commonwealth Bureau of Census and Statistics' livestock figures for 1968 show northern beef cattle numbers at 8·2m.

Allowing that (a), the present approximate average calf survival rate to yearling age in overall northern Australia is 60 per cent; (b) given better animal nutrition and management the trend in the calf survival rate would be upward; (c) breeders would be cast-for-age after rearing (on the average) the fifth calf; (d) breeder mortality would average 7 per cent; (e) breeders, including annual heifer intake at first joining, would

Table 17
Time factor in beef cattle population growth

Year	Total m. head	Breeders m. head	Calf survival m. head	Heifer survival m. head	Rate %
1968	8·200	3·280	1·968	0·964	60
1978	12·052	4·218	2·615	1·282	62
1988	17·784	6·225	4.046	1·983	65
1998	29·642	10·375	6·951	3·406	67

average 40 per cent of total cattle numbers, it would take approximately thirty years to reach an estimated potential of 28·5m. as table 17 shows.

A SAMPLE DEVELOPMENT BUDGET

A detailed appreciation of what would be involved in an assumed economically feasible development, investment and management plan of relatively modest dimension for a beef breeding and fattening enterprise in Arnhem region, based on pasture improvement with Townsville stylo, is given in the following outline:

BUDGET

Northern Territory, Arnhem Region

GENERAL DESCRIPTION	
Location	Midway between Darwin and Katherine.
Size	400 sq. m.
Purpose	Breeding and fattening beef cattle, based on 47 sq. m. of Townsville stylo (initially 47 sq. m., ultimately 150 sq. m.) combined with native pasture.
Period of development	7-10 years, starting with 1,600 foundation breeders. Pasture and structural improvement program to be completed in 7th year. First turn-off in 4th year.
Herd size	8,000 head under initial pasture improvement program; 20,000 head at full development.
Carrying capacity	One beast to 6 acres of improved pasture; one beast to 75 acres of native pasture under initial program. Beast to 5 acres on improved pasture, with aid of native pasture, under ultimate pasture improvement program.
Calf survival	Average survival to one year, 65 per 100 active breeders.
Mortality	Annual losses: breeders, 7%; steers and heifers, 2%; bulls, 3%.
Age of turn-off	Fattened males, 3 years; culled heifers with calf at foot, 3 years, fattened, 4 years; fattened cast-for-age breeders, average 9 years.
Percentage turn-off	Average 20% of total cattle number. Proportionately, 65% male, 35% female.
Outlet	Export meatworks, Katherine or Darwin.
Beef quality	Having regard to high-level animal nutrition on improved pasture; well-bred cattle adapted to the environment; efficient herd and pasture management; adequate structural improvement, plant and equipment, beef quality would be: ox beef of export quality, average carcass weight 580 lb; surplus females, g.a.q. cow beef, average carcass weight 480 lb.

Beef price The 5-year, 1964-8 average ox/heifer price at Cannon Hill (Brisbane) was $A22.70 per 100 lb carcass weight. Allowing, say, $A1.70 per 100 lb to cover higher cost of meatworks treatment at Katherine-Darwin, and $A1 per 100 lb price differential between Brisbane and Katherine-Darwin, a fair average price for ox beef would be $A20 per 100 lb (d.w.). Allowing for quality differential of $A2 between ox and cow beef (at Katherine-Darwin), a fair average price for cow beef would be $A18 per 100 lb.

Transport cost Movement of turn-off cattle would be by road transport. Cost per beast-mile would average 4 cents (80 cents per 20-head unit mile). Per head cost to Darwin or Katherine meatworks would average $A4.40.

Loss en route 1%.

On-station cattle price The average price at meatworks would be $A105.60 per head, less transport cost and loss *en route* — $A5.40. Net on-station price, say, $A100.

CAPITAL INVESTMENT

	$A	$A	$A
Townsville stylo area — 30,000 acres			
Fencing (suspension) 100 miles at $A350	35,000		
Water supply 7 points at $A5,000	35,000		
Yards (with dip) 4 at $A5,000	20,000	90,000	
Stylo seed, 120,000 lb at 50 cents	60,000		
Superphosphate, 30,000 cwt at $A2.50	75,000		
Discing and sowing, 30,000 ac. at $A2	60,000	195,000	285,000
Cattle capacity, 5,000 at 1 to 6 acres			
Development cost per beast-area $A57.			
Native pasture area — 226,000 acres			
Fencing (standard) 60 miles at $A430 say	26,000		
Water supply 4 points at $A5,000	20,000		
Yards (with dip) 2 at $A5,000	10,000		
Buildings (homestead and outcamp)	40,000		96,000
Cattle capacity, 3,000 at 1 to 75 acres.			
Development cost per beast-area $A32			
Total pasture and structural improvement cost			381,000
Overall average development cost per beast-area $A48.			

Plant and equipment			
Vehicles:		$A	
3-ton truck	$A6,000		
4 x 4 1-ton utility			
2 at $A3,000	$A6,000		
Horse float	$A1,000	13,000	
Lighting and power plant		2,000	
Welding plant		1,000	
Workshop equipment		2,000	
Refrigeration chamber (homestead)		2,000	
Riding saddles, mountings and gear 10 at $A100		1,000	
Pack saddles, bags, etc. 10 at $A100		1,000	
Tools, spares, camp gear, etc.		2,000	
Light tractor with blade		4,000	
Posthole digger, boring machine, saws, etc.		1,000	
Radio transceivers (fixed and mobile)		1,000	30,000
Foundation livestock			
Breeders	1,600 at $A100	160,000	
Bulls	48 at $A400	19,200	
Horses, stallions, brood mares	150 av. $A40	6,000	185,200
		Total capitalisation say	$A596,000

ANNUAL WORKING EXPENSES

Labour and rations	$A	$A
Operator allowance	5,000	
Head stockman	3,120	
Stockmen, 5 at $2,080	10,440	
Cook	2,080	
Mechanic	3,120	
Fence and yard repairer, etc.	3,120	26,880
Rations (excluding 400 lb beef per man) 10 at $A500		5,000
Materials and sundries	$A	
Materials for maintenance of structures	1,000	
Diesel and lubricating oil	500	
Vehicle running costs, 3 at $A1,200	3,600	
Insurance	1,500	
Inward freight, say	500	
Feed supplements, licks, etc.	1,000	
Dip materials	1,000	
Office and travelling expenses	1,500	
Superphosphate (delivered and spread)	37,500	48,100

Overheads				
Rent at 40 cents per beast-area (20,000 head)				8,000
Depreciation		%		
Buildings	40,000 at	3	1,200	
Waters	55,000 at	5	2,750	
Fences	161,000 at	3	1,830	
Yards	30,000 at	3	900	
Plant and equip.	30,000 at	10	3,000	9,680 say 98,000

ANNUAL RETURNS

Cattle Sales			
Slaughter males, 1,040 at $A116.00		120,640	
Less transport + 1% loss at $A 5.40		5,616	115,024
Slaughter females 560 at $A 86.40		48,384	
Less transport + 1% loss at $A 5.40		3,024	
Net on-station return			160,384
Less annual working expenses			98,000
Surplus, say			62,000
Surplus as earning rate on capitalisation, 10·4 per cent			
Operating expenses represent 60·48 per cent of on-station return.			

From the point of achievement of the initial 8,000-head program, planned development of the full potential, based on a total of 150 square miles of improved pasture could proceed at an average of about 16 square miles of Townsville stylo planting per year, towards achievement of the full potential within fifteen years of the date of commencement. The structural improvement cost of 12,000 additional beast-areas would be $A18 per beast area. This would add $A216,000 to the capitalisation. The costs of seed, superphosphate, timber treatment, land preparation, and sowing, in the establishment of improved pasture, are tax deductible and are, therefore, not included in the capital cost of further pasture establishment. An increase of 50 per cent in costs of additional buildings, plant and equipment would add a further $A35,000, increasing the total capitalisation to $A847,000.

At full development, the annual turn-off would rise to 4,000 head, giving an on-station return of $A400,000. The average annual operating expenses should not exceed 50 per cent of the on-station return, but allowing 60 per cent, the rate of return on capitalisation of $A847,000 would be of the order of 19 per cent. (At 50 per cent, the rate would be 23·6 per

cent.) Additionally, there would be a substantial capital gain in the value of a mixed herd of 20,000 cattle, built up over the period of development.

In postulating that a development of this kind falls within the scope of economic feasibility and that such a proposition would represent approximately twice the size of an efficient productive unit, I appreciate the magnitude and scale of the tasks of management in the development and operation of such an enterprise, and the maintenance risks involved.

BRUNETTE DOWNS, A SUCCESSFUL INVESTMENT

An outstanding example of large-scale investment in station structural improvement and herd improvement during the 1930-70 period is Brunette Downs Station, of 4,730 square miles in the Barkly region. This station was purchased in 1958 by the King Ranch Cattle Company, principal shareholders being R. J. Kleberg (King Ranch, Texas, United States), Sir Rupert Clarke and the Hordern-Baillieu (Australian) interests, from the Gulf Cattle Company — the James and Bruce White family interests.

In 1957 the Brunette Downs herd numbered approximately 50,000 of the best bred shorthorn cattle in the Territory. This part of the Barkly region experienced severe drought conditions in 1957, resulting in the loss of more than 20,000 of the Brunette Downs herd. At that time Brunette Downs was the best improved station of its size in the Territory (it is still the best improved). At the time of the sale, in 1958, a bangtail muster revealed a survival of about 29,000 head of cattle.

In 1957 there were forty sub-artesian bore water supplies on Brunette Downs, since increased to 122 points. Station boundaries and sub-divisional fencing now total 1,800 miles. Expenditure on stockyards, airstrips, internal roads, and buildings has been substantial. (Minimum standards of fencing and made water supply adopted by the B.A.E. for Barkly region — fencing 25 miles, made water points two per hundred square miles — as applied to Brunette Downs would require 1,183 miles of fencing and 95 water points.)

THE STANBROKE PASTORAL COMPANY

An example of a practical contribution to development of the beef industry in Queensland by a recently established pastoral company is apparent in the fourth annual report of the Stanbroke Pastoral Company

for the year ending June 1968. This company is predominantly Australian owned and is playing an important part in the development of the beef industry in northern Australia.

The Stanbroke Company was established in 1964. Its present (1968) authorised capital is $A10m.; the issued capital is $A4·9m. The ownership is 70 per cent Australian and 30 per cent British. The Australian contribution is in the following proportions: Australian Mutual Provident Society (A.M.P.) 51 per cent; Squatting Investment Company, 16 per cent; S. Kidman and Company, 3 per cent. The 30 per cent British content was subscribed by Thos. Borthwick and Sons Ltd.

The Stanbroke combination, as a pastoral company with widespread financial and industrial ramifications, approaches the ideal in the category of large-scale cattle raising enterprise. On the record of its four-year existence, its contribution to northern development bids fair to be an outstanding one.

The A.M.P. Society's majority shareholding is spread over the widest range of Australian life insurance policy holders as well as the greatest aggregation of assets of any Australian financial institution. Its financial involvement effectively demonstrates the feasibility of similar investment in this form of northern development by life insurance institutions. The A.M.P. Society has already played an important role in rural industry development, through pasture improvement in mineral deficient areas of southern Australia and in other aids such as mortgage financing.

The capital contribution of the Squatting Investment Company is derived from a complex of six station properties in northern, western, central, and southern Queensland, and three in north-western, western, and southern New South Wales. This company's station management 'know-how' has been acquired over a long period, from its incorporation in the 1880s.

The Sydney Kidman Pastoral Company is one of the most widely known in Australia. It has operated in large-scale pastoral enterprise, both alone and with associates, in all Australian States, excepting Tasmania, and in the Northern Territory. It is still the largest family controlled beef producer in Australia. Its knowledge of cattle raising and station operation in northern Australia, and of cattle movement and marketing is of the widest.

The British firm of Thos. Borthwick and Sons is one of the oldest established export meatworks operators in Australia and New Zealand. Its knowledge of livestock buying and treatment through meatworks, its long established overseas meat marketing connections, and its knowledge of cattle station management through previous sole ownership of some, and substantial shareholding interests in other northern cattle stations render it an invaluable component of the Stanbroke organisation.

Table 18

Stanbroke Pastoral Co. cattle potential and station improvement

Station	Area	Average rainfall	Economically feasible cattle potential			Structural improvement beast-area cost*
			Number	Turn-off		
	sq. m.	inches	head	head	%	$A
Rocklands	3,056	16	40,000	8,000	20	17
Fort Constantine	411	18	8,000	3,000	37	38
Stanbroke	1,094	14	8,000	2,500	31	34
Ardmore	2,010	11	18,000	3,500	19	22
Augustus Downs	1,159	20	20,000	4,000	20	16
Donors Hill	798	26	12,500	2,000	16	16
Havilah	390	26	30,000	7,500	25	18†
Abingdon Downs	1,873	35	30,000	7,500	25	16
Tanbar	2,962	8	12,000	7,000	58	16
Waverley	106	40	15,000	3,000	20	24†
Peak Vale	350	21				
Craven	172	21	9,000	2,000	22	26†
Banchory	120	21	4,500	2,000	44	35†
Beresford	487	21	9,000	1,500	17	25†
Frankfield	265	23	15,000	6,000	40	21†
Total	15,253		231,000	59,500	av. 26	av. 20.60

* Estimated beast-area cost of adequate structural improvement, timber treatment, etc., takes into account estimated present value of existing improvements, excluding cost of lease or freehold land, pasture improvement, land preparation for fodder cropping.

† Estimated approximate beast-area cost of pasture improvement is:

Havilah	$A28
Waverley	$A28
Peak Vale, Craven	$A35
Banchory	$A35
Beresford	$A35
Frankfield	$A35

Table 18 reflects the following approximate result of full development:

Capitalisation	$A
Structural improvements	4,192,000
Pasture improvement	1,363,000
Horses and brood mares, say 3,000 at $A30	90,000
Plant and equipment, vehicles, aircraft etc. say	600,000
Cattle, 231,000 at (realistic) av. of $A40	9,240,000
Total (excluding value of lease and freehold)	15,485,000
Estimated net return	**$A**
Average annual turn-off, 59,500 at on-station av. $A90*	5,355,000
Less costs at estimated average of 47 per cent of on-station returns	2,517,000
Surplus	2,838,000
Approx. earning rate on estimated capitalisation	18·3%
Average 'on-truck' bullock price, 1965-8	$A113
Average 'on-truck' store steer price	$A68
Less road transport and rail loading costs, say	$A90

* Includes an average of 21,500 store cattle transferred from breeding to fattening properties.

The annual report of the Stanbroke Company, for the year ending June 1968, contains a Schedule of its fifteen wholly-owned station properties in Queensland (1,389 square miles of Rocklands are on the Northern Territory side of the Queensland border.) (map 5). My impression of the cattle potential and station improvement program is depicted in table 18.

I have visited most of the Stanbroke properties over the 1948-68 period, including Stanbroke Station, as a 'sample', in the 1967 survey. The Stanbroke directors arranged for a close ground inspection of Havilah, an aerial viewing of gidgee scrub pulling over a wide area of the Queensland Central Highlands, and, particularly, a combined aerial and ground inspection of scrub clearance and pasture improvement then in progress on Frankfield. (Up to mid-1969, 55 square miles of scrub have been pulled down, burned and seeded on Frankfield, of a total of 140 square miles which the Stanbroke management has assessed as suitable for timber treatment.)

Whilst the pasture improvement program is a worthy and ambitious contribution to this form of development — one of the most ambitious, at this time, of any undertaken by a single interest in northern Australia — this certainly does not exhaust the pasture improvement capabilities of Stanbroke properties in the Gulf, central, and eastern areas of Queensland.

The location of the Stanbroke properties enumerated on map 5, indicates a near ideal pattern of integration of breeding and fattening resources, from the Gulf country in the north to the Channel country in the south; from the lighter rainfall country in the far west, to the higher rainfall country in the east.

The fifteen properties are suitably located for alleviation of drought and maximum utilisation of fattening resources. The fattening resources of the Channel country and pasture improved properties can be adequately utilised in favourable seasons, considering the beef road facilities that exist for prompt de-stocking in the event of drought. Optimum advantage also can be taken of the store cattle breeding resources of the Gulf country properties in favourable seasonal conditions.

Early in 1969, the Stanbroke directors made a significant advance in herd care and management with the appointment of a veterinarian of wide experience in cattle raising both in northern Australia and overseas. Thus, the pastoral inspectors and station managers of the Stanbroke organisation have the advantage of specialist advice and guidance, in solving cattle husbandry, health and nutrition problems by a veterinary scientist of exceptional capability.

The results of station operation in the company's short history reflect good management at all levels. This is evident in the financial and statistical record since its incorporation in 1964, as shown in the Directors' Report for 1968 from which the following is extracted:

	Period ending 30 June			
	1965	1966	1967	1968
Issued capital	$A1,600,000	$A2,600,000	$A3,000,000	$A4,900,000
Net profit before tax	$A111,748	$A160,697	$A332,688	$A527,313
% earning rate on average capital employed	11·17	7·4	12·32	13·15
Net profit after tax	$A85,966	$A143,472	$A225,488	$A361,110
% earning rate on average capital employed after tax	8·59	6·6	8·35	9·14
Dividend percentage	Nil	4	5	6
Average price of bullocks sold 'on trucks'	$A93·50	$A116	$A118	$A135
Cattle on properties	36,082	67,037	81,333	147,932
Sheep on properties	24,816	33,037	34,787	13,484

Taking the number of cattle and the cattle equivalent of sheep, in 1968, at a round total of 150,000, a 54 per cent increase is needed to reach the estimated potential of 231,000 head. With the conservatively estimated pasture improvement possibilities, the cattle potential should be achieved in a relatively short period, subject to normal seasonal conditions.

In reporting on behalf of the directors, in the Annual Report for the year ending June 1968, the chairman said:

> The scale of this development can, in the main, only be undertaken in the north by companies such as ours, with considerable financial resources. It gives us satisfaction that our Company, fundamentally Australian owned, is playing a part in the development of Northern Australia.

In the light of knowledge of serious shortcomings in the operation of some overseas controlled aggregations of northern Australia public estate leaseholds of approximately comparable size; of the successful operation, in contrast, of the Stanbroke aggregation, based on a soundly conceived and operated developmental program; of the predominantly Australian content in the financial structure, with particular regard to the majority shareholding of the A.M.P. Society; and without detracting from manifest advantages in the operation of capably managed cattle station units of efficient productive size by resident holders, I endorse the above quoted sentiment.

The annual report of the Stanbroke Company for the year ending 30 June 1969 disclosed that an additional property — Consuelo Station — of 79 square miles in Central Queensland was purchased, and that in September 1969, the A.M.P. Society and the Stanbroke Company were subscribing half — A.M.P. 37½ per cent, Stanbroke 12½ per cent — of the capital of Northern Cattle Company Pty Ltd, the remaining 50 per cent being jointly held by Placer Exploration Ltd and Kaiser Aluminium and Mineral Corp., these companies having previously purchased Moola Bulla and Mount Amherst Stations, of 1,643,576 acres, in the Kimberley region.

DEVELOPMENT IN CAPE YORK PENINSULA

One of the most enterprising, wide-ranging concepts of intensive beef production on a far northern remote region cattle holding of moderate

size is that of a project, inaugurated in November 1968 by Lakeland Downs Ltd, for the intensive development of a Cape York Peninsula property of 192 square miles formerly known as Butcher Hill Station, located 162 road miles to the north of Cairns.

This holding was included in my 1967 field study and was studied in closer detail in October 1969. The project involves private capital investment, wholly Australian, of upwards of $A5m., of which approximately $A2m. were committed in the first year of operation. In nature and scope, this investment is unprecedented in far northern Queensland. It is probably unparalleled in any remote region of the north. Its purpose is dryland and irrigated agriculture, mainly for grain production, combined with intensive cattle raising for beef of high quality based on native and improved pastures, fodder crops and stubbles, with aids of grain and other supplements.

The company successfully negotiated with Queensland Lands Administration authorities for the freeholding (at $A1 per acre) of approximately 94 square miles, subject to stringent property improvement conditions, with a thirty-year lease of the remainder.

The property is situated in tableland country at a height above sea level of approximately 800 feet with adjacent elevations of up to 2,500 feet. It is drained by the Normanby and Laura Rivers, with annual flows for an average period of four and eight months respectively.

Sub-artesian bores and dams provide adequate stock watering facilities, bridging a four- to six-month dry season period, when surface waters are unavailable, and for year round watering of closely subdivided crop areas. The average annual rainfall is 45 inches, in a 20-60-inch range.

Soils best suited to the proposed agricultural purposes are approximately 47 square miles of fertile basaltic flow types of varying colour and texture. The terrain is sloping, suitable for irrigation, with minimal erosion hazards subject to the employment of correct cultivation methods, crop-pasture rotation, and soil conservation measures. Chemical soil analyses indicate nitrogen and zinc deficiencies, which can readily be corrected.

Of the 47 square miles suitable for agriculture, the timber on 42 square miles has been pulled. Twenty-five square miles had been cleared and

ploughed by October 1969, at a cost of $A48,000, in preparation for final cultivation and the sowing of the 1969-70 season grain sorghum and maize crops. A pilot sowing of grain sorghum in the 1968-9 season indicated the feasibility of large-scale grain production, under dryland conditions. The 1970 grain sorghum yield indicated that with the application of 100 lb of nitrogen (urea) with a seed rate of 10 lb per acre, two tons of grain can be obtained.

Preliminary examination of air photographs and ground studies indicates twenty-eight possible dam sites of varying water storage capacities, ranging from about 400 to 20,000 acre-feet, on the Laura and Normanby Rivers and tributaries. A suitable site for irrigation, with an estimated storage capacity of 20,000 acre-feet, was selected on the Laura River. Construction of a dam using 'rolled earth' technique, with an estimated water storage capacity of 13,000 acre-feet, has been completed. Another dam of 9,000 acre-feet capacity, on a tributary, has also been completed in readiness for irrigation in 1970. I estimate the capital cost of storage at approximately $A30 per acre-foot.

Other possibilities are for storages, ranging from 400 to 2,000 acre-feet, some being adjacent to areas of alluvial soils suitable for irrigation. Sufficient water can be stored to service an estimated 25 square miles of irrigated crop and pasture land.

An area of approximately 47 square miles is considered to be suitable for Townsville stylo which, if properly established and adequately fertilised, should have an average carrying capacity of a beast to 5 acres. Existing isolated sown patches of buffel and *Urachloa* grasses indicate possibilities of spreading these species over as much as 47 square miles, providing about 10 square miles were part-cleared and sown mechanically.

Two moisture and pest proof sheds have been built for the storage of grain, each of 80,000 bushels capacity. Protective field storage has been designed for maximum grain yield. The fencing and yard building program provides for secure boundaries, adequate paddock subdivision and yard facilities for the effective segregation and handling of cattle.

Homestead amenities include ten separate units of modern design adequately equipped for family accommodation of staff, adapted to the environmental conditions, and suitable living quarters and messing

facilities are available for single employees. Other amenities include a school staffed by the Queensland Education Department, a modern motel, and a caravan park. An administrative block was in course of erection.

The workforce numbered 108. The total population numbered 180 persons, including eleven schoolchildren and a schoolteacher. The population at full development is estimated at 400 persons.

The principal crop will be grain sorghum with the addition of maize, the object of maize cropping being to extend the harvesting season, thereby lessening the burden of harvesting. Sorghum grain yield target is 48 bushels per acre, under dryland conditions. Under irrigation, with double the dryland fertiliser input, the anticipated yield is 100 bushels per acre. Similar yields are expected for maize. The annual coarse grain production target is 50,000 tons.

Future planning includes provision for extensive field trial and experiment with various leguminous and non-leguminous pastures, and oilseed crops such as soybean, safflower and, possibly, groundnuts.

A medium-term beef production objective is to expand from a 1969 cattle number of approximately 5,000 head, including 3,700 breeders of good average quality, to a mixed herd of up to 20,000 head by the mid-1970s. This build-up will be accelerated by periodical additions of suitable breeders as opportunities for purchase occur. Herd expansion will be based on all round management at a high level of efficiency, effective control of pests and diseases, employment of advanced animal husbandry techniques including regulated joining of bulls, artificial insemination, pregnancy diagnosis, early weaning of calves, and strategic grazing.

Cattle breed will be predominantly brahman, with preference for grey colour because of greater insect tolerance, based on a bull breeding unit of pure bred brahman type with selected brahman-cross females. The cattle breeding project is managed by a competent studmaster.

The anticipated mortality rate is estimated to average 4 per cent of total cattle number. The target of natural increase to one year old is 75 per hundred breeders joined, which is possible on the basis of planned herd management and animal husbandry practices. On the average, breeders will be cast-for-age, when target herd number has been

reached, after rearing the sixth calf. A breeder of outstanding performance could continue to the eighth or ninth calf.

The company estimate that the area used for dryland and irrigated cropping and irrigated pasture will sustain optimum cattle numbers — say 25,000 head — for an equivalent of three months of the year, the cost per beast-area of dryland pasture improvement, fences, yards, and dips, and bore-water points would average approximately $A33.

The annual cattle turn-off, at full development, is estimated at 10,000 head. At an average carcass weight of 560 lb, the beef yield would approximate 2,500 tons. (Formerly, under native pasture, semi-open range conditions, the cattle capacity of this property was 3,000 head, with an average annual turn-off of 450 head, yielding an average return of $A36,000.)

The significance of this development, relevant to the current beef situation of Cape York Peninsula proper, can readily be appreciated considering that the ten-year official statistics of the Peninsula Statistical Division show a very low average cattle number of 100,000 head. I estimate the present average annual Peninsula (Statistical Division) turn-off at 10,000 head.

VICTORIA RIVER DOWNS

A further example of substantial investment in northern beef industry development is that undertaken by the wholly Australian-owned Hooker Pastoral Company in respect of Victoria River Downs Station, of 4,772 square miles, in Victoria region. This property was acquired in 1960. At that time, it was in an advanced state of deterioration, carrying cattle of nondescript types, probably of the poorest quality ever known in northern Australia.

Over the 1930-60 period, the Victoria River Downs herd had degenerated to one of predominantly disease ridden scrub bulls and unbranded cows. In an extensive tour of this property in 1948, then of 8,700 square miles, I had the opportunity of confirming the out-of-hand state of a herd of wild cattle which I then estimated at 100,000 head, with many thousands of wild donkeys. Over the 1944-8 period, more than 20,000 head of scrub bulls had been destroyed by shooting. At this time, there were six mustering plants operating from the head station and from the

out stations. Despite this activity, an average of substantially less than 10 per cent of the herd was turned-off annually — part to Queensland for fattening and part to Wyndham export meatworks.

Over the five years previous to acquisition by the Hooker interests, in 1960, all of the commercially useful cattle that could be mustered had been moved from the station. Over the subsequent seven years, some 28,000 wild donkeys (equivalent to the carrying capacity of 15,000 steers) were destroyed. The extent of soil erosion and pasture denudation caused by the over-grazing of uncontrolled cattle numbers, brumby horses, and wild donkeys, would have to be seen to be fully appreciated. The numbers of wild animals that exploited the grazing spoke volumes for the carrying capacity of the native pastures. What remained of the fencing and yards was in such a state of disrepair as to be practically useless. Most of the station buildings were in varying stages of termite infestation. Such was the task of reconstruction and herd rehabilitation that confronted the new holders.

A vigorous structural improvement program, initiated in 1962, was scheduled for completion by 1971, by which time all grazing country of value will have been adequately watered and fenced and all cattle brought under control, with segregation of most of the herd according to age and sex.

When I visited this station in 1967, an estimated 2,400 square miles had been effectively watered and subdivided into sixty-six paddocks, varying in size from 5 to 140 square miles. An additional 1,300 square miles was scheduled for similar treatment on completion of the then current program, leaving some 1,300 square miles considered unsuitable for subdivision.

All outstations, including quarters for Aboriginal stockmen, and a large section of the homestead area structures have been rebuilt, about 1,500 miles of graded roads and tracks constructed and a new airstrip provided. Fencing included 200 miles of the boundary (mostly new) and more than 800 miles of new internal fencing providing sixty-two new paddocks. Yards numbered seventy-three (mostly new), including twenty-five sets of major drafting yards and five spray dips. Made watering points numbered forty-four, of which thirty-six were new bores fully equipped. Expenditure planned for 1967-71 provided for an addi-

tional sixteen fully equipped bores, 170 miles of fencing, and two additional drafting yards with dips.

Other expenditure had been on pest destruction, mostly donkeys, and on livestock purchases, including thoroughbred stallions and good quality herd bulls. Introduced bulls were of shorthorn, polled shorthorn, and Santa Gertrudis-cross breeds, with 4 brahman stud bulls and 100 pure and crossbred brahman females to form the basis of a local bull-breeding unit. In 1962, 3,000 good quality quiet females were transferred from the Hooker owned Rosewood Station and in 1964 1,600 were imported from Queensland. Victoria Rivers Downs has now more than 2,000 horses comparable with any in northern Australia.

The Hooker Company played the leading role in the establishment of a modern export meatworks at Katherine, which conformed with the most exacting hygiene standards laid down by the United States Department of Agriculture. This new and competitive outlet for turn-off of Victoria, Arnhem-N.T. Gulf and Barkly regions revitalised the beef industry in these regions and has played an important and ever increasing part in maintaining their economy on a sound basis. This unit began with a cattle throughput of 17,700 in 1963-4, rising to 30,700 in 1968. Katherine meatworks was completely gutted by fire at the beginning of the 1969 slaughtering season, immediately following which complete reconstruction was undertaken. Slaughtering was resumed on completion of the new works in September 1969.

Over the five-year, 1962-7 period, $A1·53m. was expended in Victoria River Downs improvements as follows:

	$A
Airstrip and roads	75,000
Buildings	237,000
Plant and vehicles	234,000
Watering points	386,000
Fencing	338,000
Yards and dips	90,000
Livestock	173,000

Other improvements, additional to those existing in 1967, had been effected by October 1969; seven sub-artesian bores drilled and equipped; three 20,000 cubic yard tanks excavated and equipped; 70 miles of

additional fencing providing six paddocks erected; one major drafting yard (of timber construction) completed, with six portable steel yards, crush and bail in operation; seven calf-branding cradles in operation at strategic points; three stationary spray dips installed and one portable outfit purchased.

An irrigation project (adjacent to the homestead area) was nearing completion. Initially, 200 acres of forage sorghum were being watered fortnightly, with planned progressive increase to 500 acres. The source of water supply is a permanent waterhole in the Wickham River, from which water is pumped at the rate of 200,000 gallons per hour. The holders expect to fatten a minimum of 1,000 2-2½ year steers during the last four months of each year. Crops will be ratooned over the wet summer season, with probable use for weaners and cast-for-age cows, from April until resown in August.

The brahman stud unit at the homestead had been expanded but was still under close control. This will continue until all scrub cattle have been cleaned out and the whole herd, in that particular area, is paddocked and under full control. To mop up remaining pockets of scrub cattle a helicopter was being used, the operation being materially assisted by portable steel yards. The expectation was that the slaughtered value of recovered scrub cattle would more than meet the cost of the operation.

Pasture improvement was in the advanced planning stage for the lighter soils on the station, using buffel grasses and improved strains of Townsville stylo. On the heavier soils, Mitchell grass had recovered after three favourable seasons and previously denuded areas were well covered.

Before its destruction by fire, the Katherine meatworks' throughput for April 1969 included 2,000 Victoria River Downs bullocks, of 3-3½ years, of an average carcass weight of 530 lb. This demonstrated quality improvement achieved in recent years. Brandings, including a reducing number of aged cleanskins, averaged approximately 20,000 for the years 1967-8.

Capital investment in 1968-9 totalled $A578,000, made up of buildings, $A47,000; plant and vehicles, $A203,000; watering points, $A76,000; fencing, $A42,000; yards and dips, $A25,000; livestock for herd improvement purposes, $A185,000, bringing the total investment for 1962-9 to $A2·1m.

LARGE VERSUS SMALL COMPANIES

Throughout the history of the Territory and the Kimberleys, it has often been claimed that only the big pastoral companies command adequate financial resources to develop the cattle industry to its realisable potential in the remote regions of northern Australia. With few notable exceptions, the facts of history show the opposite to have been more generally the case.

Many of the so-called 'small' resident holders of cattle country have survived incredibly difficult obstacles in the improvement of their stations and herds, to maintain a steady rate of annual turn-off independent of mortgages and livestock finance, ultimately to achieve financial security through prudent re-investment of surplus earnings from their enterprise. In contrast, although the greater part, and the best, of the cattle country in the remote regions is held by big absentee pastoral interests, statistics show no substantial increase in cattle numbers and turn-off over the past twenty years of good prices and buoyant demand for export beef.

A comparatively recent example of successful resident-holder cattle raising enterprise in Kimberley-Victoria regions is related to a group of six cattle properties developed from mostly near-primitive, open range beginnings to present standards of station structural and herd improvement. This group was, with the exception of one property, built up over the 1948-58 period, with sound prospects of development by 1985 to adequate levels of structural and herd improvement through re-investment of surplus earnings and achievement of an economically attainable cattle potential.

The project was initiated by the sole survivor of three sons of a pioneer cattle raising family in the Queensland Gulf Country and widely known in the top bracket of capable open range cattlemen of the remote north, with a lifetime of practical experience in cattle raising in the Queensland Gulf, Victoria and Kimberley regions.

This pioneer's experience ranged from a mostly near-bankrupt state of cattle raising over the first four decades of this century (an appropriate example being the offering for sale, in the early 1930s, of a thousand breeders in the Qld Gulf region, at a dollar a head, without attracting a buyer), up to the buoyant state of cattle raising in the 1960s. (Good

average quality bullocks exceeding $A100 at Wyndham meatworks in 1969.)

The group of properties was formed on the basis of a Kimberley station, purchased in 1917 for $A68,000 ($A400,000 in present money value terms). At that time, the only outlet for cattle was by shipment alive to Asian destinations and by droving over stock routes to Queensland and New South Wales, some walking as far as Victoria, in mobs mostly of 1,250 head. Overland distances commonly exceeded a thousand miles. Prices ranged from $A5 to $A8 per head, at Wyndham, for export, or on delivery at overland destination, down to as low as $A2 or $A3 — about the equivalent of droving costs. Infrequently, the price received was less than the cost of droving. In these difficult days, the backbone of the cattle industry in the remote north was, undoubtedly, the pioneer cattleman whose second to third generation descendants still form its backbone.

Up to the wartime suspension of slaughtering at Wyndham meatworks there was little in the twenty-five year experience of the operation of the property purchased in 1917 to justify plans for expanding to larger-scale, family enterprise in Kimberley-Victoria regions — even for one with an abiding faith in the ultimate economic possibilities of developing the true beef potential of these remote regions.

In the early post-war period, however, the economic outlook for beef production in the Kimberleys became progressively more encouraging. In 1945, the first year of resumption of slaughtering at Wyndham, the average price per head paid for the 38,000 head throughput was $A15, rising progressively to a 1969 average of more than $A80 for a 39,200 head throughput.

Foreseeing this unprecedented change in the overall economic outlook for Australian beef production, the holder set about acquiring additional cattle properties with largely undeveloped potentials, to meet the future needs of settling family members in their own right. The first addition to the property acquired in 1917 was made with the purchase, in 1948, of a station with an estimated potential, at full development, of 10,000 head of cattle. Additional properties were acquired, as opportunity offered and sufficient funds for purchase became available, until the group was expanded to a total of six cattle stations, adequate for the

needs of the members of the joint family interests. All purchases were financed without resort to any form of borrowing, by way of mortgage or otherwise.

I estimate the economically feasible cattle potential of the group, attainable by 1985, as shown in table 19.

In the early 1960s, various people in the United States, who were interested in the possibilities of profitable investment in cattle industry development in northern Australia, learned of the pasture improvement potential in the Peninsular region. The half-century history of Townsville stylo in the Gulf and Peninsular regions became known to them through the agency of visiting Australians, who sought to induce their investment in the development of this resource.

This led to the acquisition of eleven Peninsular cattle stations by various American purchasers. A total of twenty leases, nineteen by private treaty and one by public competition, composing 9,000 square miles, were acquired by American investors.

The term of most of the leases was of thirty-three years, the year of expiry varying between 1977 and 1999. All of the stations purchased are in Cook Shire, which covers most of Peninsular region to the north of the Mitchell River. The total area of pastoral leases in Cook Shire is approximately 31,600 square miles, of which 28·4 per cent is now held by the American investors.

Several of the American purchases were negotiated by Gunn Rural Management Pty Ltd, of Brisbane, of which Sir William Gunn (chairman of the Australian Wool Board) was managing director. Persistent efforts were made by Sir William to obtain for the American purchasers more secure tenure than the existing leases, but without success. The Queensland Minister for Lands firmly declined to accede to this request. This was consistent with Queensland's public estate administration throughout this century. In the State Parliament, on 23 August 1966, in reply to a series of questions by the member for the electorate of Barcoo, relating to the American purchases, the Minister gave the following information:

> Americans were spending more than $2.25 million on the development of 20 recently acquired cattle leases in Cape York Peninsula.
>
> The Americans were in exactly the same position as any other pastoral

Table 19

Capital structure and economic potential of a group of cattle stations in Kimberley-Victoria regions operated by resident holders

Station	Size sq. m.	Cattle Potential: Number head '000	Cattle Potential: Value $A '000	Cattle Potential: Annual turn-off head	On-station value $A '000	Structural improvement cost $A '000	Plant, equipment, horses cost $A '000	Total capitalisation $A '000	Annual working costs $A '000	Net return $A '000	Rate of return %
A	1,359	16	720	2,500	212	400	80	1,200	95·4	116·6	9·7
B	512	10	500	1,800	162	250	50	800	72·9	89·1	11·1
C	1,562	14	560	2,100	168	350	70	980	75·6	92·4	9·4
D	1,563	10	400	1,500	120	300	50	750	48·0	72·0	9·6
E	1,406	13	650	2,500	225	350	65	1,065	101·2	123·7	11·6
F	994	9	450	1,500	135	200	45	695	60·7	74·2	10·7
Total	7,396	72	3,280	11,900	1,022	1,850*	360	5,490†	453·8	568·0av.	10·3av.

* Approximately $A26 per beast-area.

† $A76·25 per head of 72,000 cattle.

lessee in Queensland. They had not asked for nor had they been promised freehold tenure.

The leases would be subdivided for new settlement, laid down in the Lands Acts, when they expired.

If foreign capital can be used to advantage the peninsular area is certainly an ideal place.

Tremendous capital is required to cope with a situation of remoteness, transport difficulties, labour problems and high costs of development.

Eight of the leases were acquired by individual Americans. The total area of the leases was 9,003 square miles.

The new tenants intended a programme of fencing and the provision of watering facilities in fenced paddocks. They also proposed to experiment with new pastures.

On the basis of the opinions of experienced producers in the area and experts in northern development, including C.S.I.R.O., we very confidently expect that the return for Queensland will be substantial.[2]

I visited six of the American-held properties, from the southernmost to near the northernmost, in 1967, and noted the progress of development. Improvements on the properties included 196 miles of fencing, six sets of well-constructed cattle yards equipped with dips, new homestead buildings, and 23 square miles of fertilised Townsville stylo. That part of the pasture sown on well-prepared land, with an initial dressing of 3 cwt of superphosphate per acre, would carry an average of at least a beast to 3 acres. This inspection confirmed my estimate of the feasibility of an average carrying capacity of a beast to 6 acres over the 18,750 square miles of Townsville stylo capability in Peninsular region.

In less than two years, to December 1966, Gunn Rural Management Pty Ltd erected 556 miles of fencing, constructed thirteen sets of cattle yards with dips, and sowed 33 square miles of Townsville stylo on Peninsular properties managed on behalf of American investors. This was the most vigorous station improvement program ever undertaken in the history of the Peninsula, though it still amounts to but a fraction of the total required for the achievement of my estimated Peninsular potential of 2·3m. head of cattle.

Little by way of development of Peninsular leases, other than those under the Gunn management, had been undertaken up to mid-1967.

[2] *Q.P.D.*, Vol. 243, pp. 158-9, 23 Aug. 1966.

Two properties, with estimated combined native pasture carrying capacity of 16,000 head, carried approximately 10,000 head in 1958. Each had changed hands twice before acquisition by the American purchasers. By 1967, cattle numbers had declined to less than 5,000.

THE TIPPERARY CORPORATION

The Tipperary Corporation invested heavily in grain sorghum growing on Tipperary Station in the 1967-8 and 1968-9 seasons; neither sowing proved an economic success. The *Australian* of 10 February 1970 reported a loss of $A3m.

The following extracts relative to the Tipperary Land Corporation are quoted from a special article by Peter R. Kann, Staff Reporter, which appeared in the *Wall Street Journal* (U.S.) of 9 February 1970, under the heading: 'Boom Down Under: Americans buy Land in Australia's Northern Area.'

> Not all American land ventures have had easy sledding. A couple of years ago, Tipperary Land Corp. of Midland, Texas, purchased the lease of a 3,560 square mile Top End [Arnhem Region] cattle station and announced plans to turn it into a giant farm that would export grain sorghum to Japan. The company planned to produce 12,000 acres of sorghum the first year and double this total annually to reach 192,000 tons in the fifth year.
>
> Problems sprouted faster than the grain. The first year's crop was largely ruined by unseasonable rains. The second year's crop was only a fraction of anticipated yield, though 4-500 tons of grain were finally shipped to Japan, late last fall, at considerably more than anticipated cost. The company initially was hampered by management problems here and in Texas.
>
> American farm machinery was imported at great expense. Much of it proved unsuited to the land and now lies idle. Some machinery was never uncrated. 'It was incredible waste. We couldn't have used it all in 20 years' says one official. Tipperary has invested some $8 million to date in development of Tipperary station and several smaller outlying properties.
>
> Last February, however, the company installed new management and it has since embarked on a less ambitious development effort. Sorghum acreage has been cut back sharply and large areas of cleared land are being converted to improved pasture and stocked with cattle. The company still is aiming at large-scale grain export but more gradually. Tipperary has proved that grain export is possible if not yet profitable, and other landholders say they have learned from the painful pioneer effort.

> One aim of Tipperary and a number of other big stations is to eventually subdivide and sell off parcels of developed land. Such subdivisions, including improved grazing pasture and agricultural land, might run anywhere from 3,000 to 10,000 acres.
>
> Several factors besides the lack of a capital gains tax favor subdivision. Stations of 3,000 or 4,000 square miles may simply be too big for individuals to develop. A few decades from now the Australian government might not look so kindly on big holdings. And the government is expected to look more favourably on lease renewals (leases are for 50 years) if portions of the properties have been subdivided. 'Subdivision is our long term aim' says Gough Letts, director of primary industries for the Northern Territory . . .

The corporation is, evidently, also interested in other forms of development. The *Sydney Morning Herald* reported (on 21 June 1969): Tipperary will spend $A3m. on Bauxite tests.

> Tipperary Land and Exploration Corporation is undertaking a feasibility study of its bauxite deposits in Cape York Peninsula, Queensland. . . The study is expected to cost $3 million but it is stressed results of the study cannot be predicted at this time. . . Tipperary has extensive farming and cattle operations in Australia as well as oil producing properties and mineral leases in the United States.

The major activities of the Tipperary Corporation, to 1969, indicated preference for grain production and mineral exploration rather than intensive beef production, based on pasture improvement. Allowing for tax concessions in long-term improved pasture establishment, an initial investment of $A3m. for that purpose would provide for the ultimate carrying of 150,000 head of additional cattle on the Tipperary Corporation's cattle stations in Arnhem and Peninsular regions.

While the 1967 Crown Land Ordinance was being debated in the Territory Legislative Council, Sir William Gunn, as managing director of the Tipperary Land Corporation, was forcing the pace on Tipperary Station (map 3), with the clearing and preparation for sowing of 19 square miles to grain sorghum. Nothing approaching this magnitude had previously been attempted in the Territory, if, indeed, anywhere in Australia. The Commonwealth Bureau of Census and Statistics Northern Territory Statistical Summary 1969 shows that for the years 1963-4 to 1966-7 the acreages sown to grain sorghum were 527, 1,249,

1,093, and 527 respectively. Grain yields per acre were: 1963-4, 707 lb; 1964-5, 505 lb; 1965-6, 659 lb; 1966-7, 857 lb. Northern Territory Administration official 1968-9 statistics show a grain yield of 4,900 tons from 16,900 acres sown — 650 lb per acre.

The seasonal conditions in which the Tipperary 1967-8 crop was grown were ideal. The Tipperary Land Corporation had negotiated a contract with the Japanese government for the purchase of the grain, subject to quality. According to the president of the corporation, originally the crop was expected to yield 2,500 to 3,000 lb an acre. The average yield at Katherine Research Station for the years 1962-6 was 1,966 lb/acre on experimental plots. The President said the Northern Territory Port Authority had built facilities to store and load on ship 8,000 tons. But there would be another 3,000 tons of storage available at other points in Darwin. (After viewing the land preparation for the 1967-8 grain sorghum sowing I was asked for an opinion on the venture. I replied that by the time the Corporation had lost twice the purchase price of Tipperary — $A1·5 m. — it would realise that the best prospect lay in intensive pasture improvement to achieve my estimated Tipperary cattle potential of 125,000 head.)

In May 1968 the Minister for the Interior announced:

> The U.S. controlled Tipperary Land Corporation was expecting a yield of 1·3 tons an acre from its first grain sorghum harvest now underway on Tipperary Cattle Station south of Darwin. . . First sorghum shipment of 13,000 tons to Japan was expected to leave Darwin at the end of next month. Work was now underway. . . to prepare 24,000 acres for next season's planting, double last year's acreage. . . The corporation is investing $A20 million in the sorghum venture and expects to lift acreage to 190,000 acres within five years. . . The weather this season was exceptionally favourable and the predicted yield is fairly close to the 1·5 tons per acre target ... with experience gained this year the company hopes for an improved result from better control of operations such as planting, fertilising and ploughing.[3]

On 21 June 1968 it was reported that the expected yield of 16,000 tons would be reduced to 5,000 tons. The vice-president of the Tipperary

[3] *Financial Review*, 8 May 1968. See also *Country Life* (Qld), 23 May 1968, announcing the retirement of Sir William Gunn as managing director of the Tipperary Land Corporation, to become effective from 1 June 1968.

Corporation said 'The loss is substantial — a real kick out of our hides, but it isn't enough to make us quit. We will double the crop this year — to 24,000 acres'. (Actually, none of the grain harvested was in marketable condition. The Darwin area had more than 10 inches of rain in May — the heaviest May fall since 1882. The rains, followed by hot sun, had damaged the crop.) The vice-president's final comment was: 'We came to the Northern Territory because we think it is the only place in the world where it is possible to demonstrate the economics of large scale farm production. We still believe that to be so.'[4]

On the basis alone of the failure of the first two grain sorghum crops, it would be unreasonable to condemn this initial Tipperary Land Corporation venture as an indication of permanent failure, however doubtful the prospects of eventual success may seem. But the initial experience certainly points to a high degree of risk, particularly in the light of relatively poor yields of previous commercial sowings of grain sorghum in this environment.

Sir William Gunn's managing directorship of the Tipperary Land Corporation ended with his retirement in June 1968, but his influence whilst managing director had contributed to the most far-reaching amendment of land laws and tenures in the history of northern Australia. In my opinion, it was the prospect of a major land development scheme, with consequent enhancement of the Territory's future, through the promise held out by Sir William of beneficial closer settlement ensuing from the Tipperary Corporation's initiative and enterprise, that tipped the scale in favour of the passing of the unprecedented 1967 Territory Crown Lands Ordinance No. 2. Irrespective of whether the Tipperary grain sorghum venture succeeds or fails, the Territory pastoral leaseholders will still have the highly advantageous 'rolling' lease tenure and the opportunity for the freeholding of up to 312 square miles of arable land.

From several studies of this part of Arnhem region, it is my conviction that high production potential of Tipperary Station lies in substantial increase of cattle numbers and turn-off through pasture improvement. In this environment there is a proven Townsville stylo capability which, if well established, adequately fertilised with superphosphate, and

[4] *Sydney Morning Herald*, 21 June 1968.

efficiently managed, would, in my opinion, carry an average of a beast to 6 acres. Tipperary comprises 3,560 square miles. Assuming that one-third were developed for Townsville stylo, I estimate this could carry 125,000 head of cattle (representing twelve cattle station units of efficient productive size) with an average annual turn-off of 25,000 head. The cost of establishment, including fencing, water supplies, stockyards and cattle dips, would average (excluding initial superphosphate input) $A50 per beast-area — $A6·3m. At a conservatively estimated on-property cattle price of $A80 (presently $A100 for cattle of such quality), the gross return for a 25,000-head annual turn-off would be $A2m. Allowing that 60 per cent would be absorbed in costs, the return on the investment would represent approximately 13 per cent. The $A3m. loss incurred in the unsuccessful grain sorghum ventures of the 1967-9 seasons would have financed the pasture improvement potential of Tipperary Station.

THE HUMPTY DOO RICE SCHEME

A previous episode in large-scale farming operation is worth recording. A rice-growing project at Humpty Doo, in the Darwin area.

The first attempt to establish large-scale agriculture in the Territory was made in a commercial rice-growing venture at Humpty Doo, on the Adelaide River, about 50 miles to the south-east of Darwin. The average annual rainfall in the Darwin area is 60 inches, spread over the December-March period, with infrequent falls in April and May. Because of its relevance to the Tipperary Land Corporation's grain sorghum project, the following brief résumé of the history and experience of the Humpty Doo venture is given.

In July 1959, the Minister for Territories appointed a committee (the Forster Committee) to inquire into the prospects of agriculture in the Northern Territory.

The committee was given eight terms of reference, one of which required study of 'the relationship of agriculture to the expansion of the pastoral industry'. In its Letter of Transmission of its Report to the Minister, the committee said:

> The problems of the pastoral industry have been discussed only insofar as they relate to problems of agriculture, that is, pasture improvement and its utilisation, and arable farming. One of our main themes has been that

the development of agriculture cannot be considered separately from the development of the beef industry. There are many problems of the pastoral industry which can be considered separately from problems of agriculture, but we have not felt a responsibility to discuss these in detail.[5]

The Report gave a detailed description of the problems and possibilities of rice-growing in the Arnhem region environment — in my opinion, the best yet given. It sounded the following note of caution:

The Government policy with respect to rice production on the sub-coastal plain should be one of confident but cautious optimism about the future of rice in this region, recognizing the main problems in achieving satisfactory yields and returns to be: . . . Development of a farming system with a rotation including a pasture for cattle feeding.[6]

The Report described a proposal submitted by Mr Allen T. Chase, a United States investor, to the Commonwealth government in September 1953, in the form of a plan to undertake development of land for rice production in return for rights over large areas of the sub-coastal plains. Although not politically and legally acceptable in its original form, the negotiations led to an agreement between the Commonwealth government and Territory Rice Ltd (promoted by Chase), signed in December 1955. The attitude of the Commonwealth government to the proposal was epitomised by the Minister:

This is a case where private enterprise is prepared to venture a large amount of capital in an endeavour to prove its opinion that a large-scale rice industry could be established. The element of risk in the venture and the large amount of capital required for development, could only be undertaken by a company backed by substantial capital resources. The Government saw nothing but advantage in encouraging the enterprise, particularly as very little use is made of the land now, and the Government has nothing to lose if the enterprise fails, but everything to gain if it is successful. All those who are genuinely interested in the Territory's future will welcome the prospect of such substantial capital investment, which will, for the first time, test on a large scale the agricultural possibilities of the Territory.

If the enterprise is successful and is carried out to the full extent of the option, it will change the face of the Northern Territory.[7]

[5] *Prospects of Agriculture in the Northern Territory*, Report of the Forster Committee, p. 1, Department of Territories, Canberra, 1960.

[6] Ibid., p. 92.

[7] Ibid., pp. 202-3.

The agreement provided for taking up by the company of successive 8 square mile units of land on agricultural development leases to a total of 800 square miles spread over fifteen years. The agreement also provided for the subdivision of the land into areas suitable for agricultural leases which could be sold to individual settlers, subject to approval by the Minister.

The estimated plantings of rice by the company were for the seasons 1955/6, 180 acres; 1956/7, 600 acres; 1957/8, 200 acres; 1958/9, 5,000 acres; 1959/60, 5,000 acres. In the first three years, yields were of the order of one ton per acre. The two 5,000 acre yields were disappointing — 1959, 1,250 tons; 1960, 3,300 tons of grain of inferior quality.[8] At no stage did the venture give promise of economic success. The Forster Committee's final comment was:

> Territory Rice has failed until now because the internal management policies adopted by the company prevented it from overcoming the considerable difficulties associated with this venture. It would be wrong to condemn the future of rice on this experience alone.[9]

Sir William Gunn became interested in the Humpty Doo project in 1959 and became its managing director in 1960. His theory then was that small-scale farming was the only way of operating the rice fields economically.[10]

The Tipperary experience indicates that privately operated closer settlement, principally based on grain sorghum growing, gives no greater promise of success than did the Humpty Doo venture.

[8] Ibid., p. 203.
[9] Ibid., p. 204.
[10] *Sydney Morning Herald*, 3 July 1961. 'Hope Still Lives for N.T. Rice Project'.

9

PLANNING FOR THE FUTURE

WE must recognise that, offsetting increased beef production resulting from investment in structural improvement, there has been serious depletion of native pastures in semi-arid regions of the north over the past fifty years. This has become more pronounced in particular areas over the past twenty years. In the upper Ord valley, the Western Australian government had to resort to the drastic measure of large-scale property resumption, in 1967, of 3,281 square miles of cattle country. This action became necessary because soil erosion had reached a state of such severity as to constitute a positive siltation threat to the major Ord River water conservation and irrigation scheme which was to be largely financed by the Commonwealth.

The government of Western Australia has, in recent years, been engaged in large-scale and costly erosion reclamation measures and pasture regeneration in the upper Ord valley. Already there is evidence of improvement, but it remains to be seen whether the remedial measures will result in complete, or only partial, restoration of the original stock-carrying capacity. It is clear, however, that the longer the undertaking of similar measures on the Territory side of the watershed is delayed the greater will be the degree of degradation and the more costly will be the work of reclamation. The progressive pasture degradation that is occur-

ring in parts of the northern semi-arid zone is counter-balancing the beneficial effects of more water supplies and fencing.

The need for native pasture and soil conservation has been recognised by the Commonwealth to the extent of providing modest funds for the establishment of a CSIRO rangelands research unit to study the arid and semi-arid regions of Australia, both northern and southern. The following extract from the outline of the CSIRO 'Rangelands Research Programme' is relevant to the menace of pasture denudation and soil erosion:

> If Australia fails to take up this challenge it can expect, as inevitable, a continued and accelerated degradation of the resources and ultimately an almost complete loss of productivity. The financial loss will affect the standard of living of every Australian — not just the pastoralists — and the resultant dust bowl will affect the living conditions of even our urban populations.[1]

On the question of better administration of the public estate (without which the attainable beef potential of the remote regions cannot be achieved), there is no present indication that either the Commonwealth or the Western Australian governmental authorities contemplate any significant changes in land tenures or occupancy systems enacted by them in recent years. The present trend in the Kimberley, Arnhem-N.T. Gulf, Victoria, and Barkly regions is unmistakably towards further aggregation of estates by overseas investors to the extent that, if it continues, relatively little land will remain in the hands of *bona fide* Australian producers by the end of this century.

THE BEEF ROADS PROGRAM

In the light of poor beef production performance related to the beef road construction programs for the remote regions it is relevant to consider the basis upon which beef road proposals were evaluated by the B.A.E., and recommended for Treasury approval. The question arises as to whether approval was justified in terms of the anticipated greater contribution to export income earning from increased beef production,

[1] R. A. Perry, 'Rangelands Research Programme', p. 10. CSIRO, Canberra, May 1968.

directly resulting from the provision of adequate facilities for road transport of cattle.

The B.A.E. was principal adviser to the Commonwealth government in the economic evaluation of beef road construction proposals submitted by the governments of Queensland and Western Australia and Northern Territory Administration. It was my task to define the sphere of transport influence of particular road proposals and to estimate the potential cattle number and average annual turn-off of stations to be served by particular roads (map 1). In the performance of this task, it was the holding rather than the holder that figured in my estimation of the cattle potential. I assumed that the land would be effectively occupied and the grazing resources efficiently utilised.

In recent years, the demand for beef has been strong and cattle prices have been high. The cattle price/station operating cost relationship has been not unfavourable. With the exception of the Centre and Channel regions, which were drought affected up to 1966, seasonal conditions throughout the remote regions were about normal. In the drought affected areas, crippling stock loss was avoided due to the favourable market for lean beef of manufacturing quality. Facilities for the road transport of cattle over the 1964-9 period have been reasonable. Before the strong United States demand for lean beef in 1959-60, the northern beef industry had been guaranteed against unprofitable cattle price by the United Kingdom meat agreement entered into in 1952. In most respects, economic conditions in the northern beef industry had never been better than during the 1950s and 1960s.

Assuming beef production would be substantially increased through the combination of adequate facilities for the transport of cattle and station structural improvement, the remote region cattle potential should have been well advanced towards achievement by 1973. But the statistical history of the first half of the ten-year period indicates that much less than the potential estimated in the evaluation of the beef road proposals will be achieved within the anticipated ten-year period. The conclusion is, therefore, inescapable that the beef roads program could not be justified on the economic results alone of the beef industry in the remote regions served by the beef roads. The anticipated greater contribution to export income has not been realised. This is the inevitable

result of the largely ineffective occupancy of the cattle lands and utilisation of the pastoral resources.

NATIVE AND IMPROVED PASTURE

Table 20 shows my assessment of economic capability on the basis of the most efficient utilisation of the native pasture resources of the remote regions.

As to the economic feasibility of a remote region cattle potential based on improved pasture, which has been established as technologically feasible at a level as high as an average of a beast to 3 acres of well-established Townsville stylo in areas of adequate rainfall, no long-term farm-scale case history exists of the kind on which the appreciation outlined in table 20 was formulated. Lacking the evidence of such experience, I have taken the liberty of halving what scientists of the Land Research and Tropical Pasture Divisions of CSIRO have demonstrated as technologically feasible. On the basis of an average of a beast to 6 acres of well-established Townsville stylo, I estimated the economic possibilities of development of a remote region pasture improvement cattle potential (excluding N.T. Aboriginal reserves) as shown in table 21.

The technological feasibility of achieving a remote region cattle potential (excluding Arnhem region Aboriginal reserves) of 5·6m. head, based on pasture improvement, has been compellingly demonstrated by the results of scientific research and experiment, but little evidence exists of intention on the part of landholders in areas of suitability for Townsville stylo to invest substantially in this form of development, on a scale likely to achieve the estimated potential over, say, the next thirty years. The proportion of 73,125 square miles of suitability sown to 1969 (200 square miles in Arnhem region, 45 square miles in Peninsular region, practically nil in Kimberley or Qld Gulf) is so small as to discourage assumption of the likelihood of such investment, lacking positive governmental action to ensure that it is undertaken. There is no obligation on landholders, under existing land occupancy systems, to undertake pasture improvement, nor is there any existing governmental measure by which this can be enforced.

Three crucial questions arise: whether the governments of the

Table 20

Remote region non-pasture improvable areas
economically feasible efficient productive herd size capability

Area	Cattle number	Structural improvement			Per beast-area	Plant, equipment, horses	Value breeders, bulls	Capitalisation	Net return	Rate of return
		Existing	Needed	Total						
	m. head	$Am.	$Am.	$Am.	$A	$Am.	$Am.	$Am.	$Am.	%
Queensland	2·4	60·5	23·5	84·0	35	12·0	76·3	172·3	21·0	12·2
Northern Territory	1·7	39·6	20·8	60·4	36	8·5	52·3	121·2	13·7	11·3
Kimberley	0·8	8·8	9·6	18·4	23*	4·0	20·7	43·1	5·3	12·3
Total	4·9	108·9	53·9	162·8	av. 31	24·5	149·3	336·6	40·0	av.11·9

* The relatively low structural improvement cost per beast-area in the Kimberleys is due to (a) the need for fewer made watering points because of a greater proportion of permanent natural waters, and (b) the ability to substitute mountainous features for fences results in the need for a lesser average mileage of fencing per 100 sq. m. than in the case of Barkly-Qld Gulf-Centre-Channel regions.

Table 21

Remote region pasture improvable areas economically feasible efficient productive capability

Area	Cattle number	Herd size	Structural improvement	Pasture improvement	Total	Plant, equipment, horses	Value breeders bulls	Total	Net return	Rate of return
	m. head	head	$Am.	$Am.	$Am.	$Am.	$Am.	$Am.	$Am.	%
Queensland	3·2	8,000	96·0	124·8*	220·8	16·0	71·7	308·5	31·7	10·3
				62·4†	158·4	16·0	71·7	246·1	31·7	12·9
Northern Territory	2·0	10,000	60·0	78·0*	138·0	10·0	44·8	192·8	18·0	9·3*
				39·0†	99·0	10·0	44·8	153·8	18·0	11·7
Kimberley	0·4	10,000	12·0	15·6*	27·6	2·0	9·0	38·6	3·6	9·3
				7·8†	19·8	2·0	9·0	30·8	3·6	11·7
Total	5·6	av. 9,333	168·0	218·4*	386·4*	28·0	125·5	539·9*	53·3	av.9·87
				109·2†	277·2†	28·0	125·5	430·7†	53·3	av.12·38†

* Assuming full cost ($A39 per beast-area) of seed, cultivation, and sowing, and superphosphate in improved pasture establishment.

† All cost items under * are deductible from taxable income in the year incurred. On the assumption that with progressive improved pasture development over a 15-20 year period, tax deductibility would operate to reduce overall pasture improvement costs by at least half. Figures show costs after deduction.

Commonwealth, Queensland, and Western Australia have the conviction that development of this particular potential is economically feasible; whether it lies within their legislative powers to enact effective measures to ensure such development; if so, whether (and when) the governments concerned are likely to take and enforce such measures. The lessons of history point to the certainty of powerful opposition by large and politically influential absentee landholding interests, particularly those of overseas origin, to any measure by which they could be compelled, as a condition of their lease, to undertake such development.

Since more than half of the remote region pasture improvement potential lies in Arnhem region, the Commonwealth should play the leading role in fostering its development. I estimate that more than half of the Arnhem region Townsville stylo potential is in the Arnhem Land, Daly River, and Beswick Aboriginal reserves. Development of this part of the potential for the benefit of Territory Aborigines, of whom there are more than 24,000, including approximately 20,000 fullbloods (of Australia's total of 45,000), is both practicable and urgent, but there is a clear obligation on the Commonwealth to undertake development of this sector, thus setting a practical example for Arnhem-N.T. Gulf region pastoral leaseholders to follow.

DEVELOPMENT IN ABORIGINAL RESERVES

The Commonwealth has acknowledged the feasibility of developing the pasture improvement potential of Arnhem-N.T. Gulf regions. This was unambiguously spelt out by the Minister for the Interior in Parliament on 9 May 1968:

> estimates of beef cattle potential have been made in relation to districts and individual beef and pastoral roads service areas.
>
> The following detailed district estimates are given as 'realisable potential' in 15 or 20 years, that is, total numbers and turnoff possible if adequate breeders are available for build up of herds, and present known methods of pasture station and livestock improvement and disease controls are applied.

District	Total number	Turn-off %
Darwin and Gulf	1,000,000	25
Victoria River	450,000	20
Barkly Tableland	650,000	20
Alice Springs	300,000	22

o

Darwin and Gulf estimates are based only on existing pastoral lease areas and do not include Arnhem Land and other reserves which may also have comparable potential.[2]

These estimates are important in the context of remote region pasture improvement possibilities, especially as regards the Aboriginal reserves, for the following reasons.

1. The estimate of a million head cattle potential for Arnhem-N.T. Gulf region (exclusive of Aboriginal reserves) is approximately five times greater than the average of the 1950-69 period.
2. The estimate of a 'realisable potential' turn-off of 25 per cent is substantially higher than the conservative 20 per cent estimate in the Budget (see p. 153 and table 14); if applied thereto the 'rate of return' would be substantially higher, and much more attractive from a capital investment standpoint.
3. Acknowledgment that 'Arnhem Land and other [Aboriginal] reserves may also have a comparable potential' is also *prima facie* an acknowledgment of the practicability of developing this particular part of the potential, both for the direct benefit of Aborigines and as an example to leaseholders in the region.

Changes in pastoral areas leased and cattle carried, and estimated potentials in the Arnhem-N.T. Gulf regions are shown in table 22.

Table 22

Changes in cattle lands held and numbers carried, and estimated potentials in Arnhem-N.T. Gulf regions, 1948-69

Year	No. of holdings	Area held	Change	Cattle carried	Change	Estimates of cattle potential		
						Joint B.A.E. N.T. Admin 1951	Dept of Interior 1967	Author 1969
		sq. m.	%	head	%	m. hd.	m. hd.	m. hd.
1948	46	49,728		228,500				
1969	57	67,279*	+35·2	172,000	−21·6	0·3	1	2·4*†

* Based on title information compiled by Lands and Survey Branch, Northern Territory Administration, shown in Pastoral Map, 1969, exclusive of Aboriginal reserves.

† Based on pasture improvement, 2m.; native pasture, 0·4m.

[2] *C.P.D.*, Vol. 59, H. of R., p. 1356, 9 May 1968.

The Commonwealth can and should take positive action to counter the unwillingness of landholders actively to exploit the Townsville stylo resource. It now has both the opportunity and an obligation to initiate a large-scale developmental project for intensive beef production, in the Arnhem region Aboriginal reserves, based on pasture improvement with Townsville stylo, thereby demonstrating its economic feasibility.

The Commonwealth government has made clear its wish that the pastoral resources of these reserves should be utilised for the benefit of Aborigines. In July 1968 the Minister for the Interior and the Minister in charge of Aboriginal affairs, in a joint statement, said:

> There are more than 60,000,000 acres of Aboriginal reserves in the Northern Territory. Some of this land is first class, and the reserves, when properly developed, are sufficient to provide a rich living for at least as many people as there are Aborigines in the Northern Territory.
>
> It is the active policy of the Government to develop these reserves for the benefit of the Aboriginal people so that those who live on them will become self-supporting as soon as practicable. It is, of course, recognised that this process is not simple or direct and takes time. Nevertheless, whatever its difficulties, it will continue to be pursued.[3]

This statement of government policy confirms a previously expressed view by the Minister for Aboriginal affairs in the House of Representatives on 12 October 1966, from which the following extract is quoted: 'Arnhem Land should be thought of as belonging to the Aboriginals, and should be exploited for the interests of the Aboriginals primarily and of nobody else'.

The opportunity to give effect to these statements exists in soundly planned, large-scale beef production development, operated primarily for the benefit of Aborigines, on a pasture improvement basis, that could become entirely self-supporting as well as contributing substantially to Australia's export income, and providing a compelling example for private landholders in the area, both resident and absentee, to follow.

The total area of the three reserves is 37,615 square miles. If the estimate of 20,312 square miles with Townsville stylo capability within the reserves proves accurate, and a cattle-carrying capacity of 2·4m. head (at a beast to 6 acres of Townsville stylo plus native pasture) proves

[3] *Canberra Times*, 11 July 1968. See also *Financial Review*, 8 July 1968.

feasible, the total capability could be developed progressively over a 25-30-year period. At full development, the annual turn-off should average approximately 400,000 head — eight times the cattle throughput of the Katherine and Darwin export meatworks in 1969; more than ten times the 1969 turn-off of Arnhem-N.T. Gulf cattle stations. At the present on-station price of $A100 per head for well-fed, well-bred slaughter cattle, this turn-off would yield $A40m., which would represent export income. (The total value of cattle produced in the Northern Territory in 1969 was $A20·058m.) Thus, the Aboriginal reserves alone can achieve approximately half of the Arnhem-N.T. Gulf cattle potential.

I believe this can be done under a soundly planned long-term program for the full development of the improved pasture resources of the three reserves, employing Aborigines in the performance of tasks for which they have marked aptitudes — such as fencing, yard building, construction of water supplies, land clearing and preparation, cattle handling.

A practicable means by which it can be done would be by the creation of a Northern Territory Aboriginal Affairs Authority, combining adequate representation of Aborigines with autonomous powers and ample funds for the primary purpose of developing the cattle potential of the Aboriginal reserves. Such an authority could operate under a Minister for Aboriginal Affairs. It could have the benefit of the scientific research resources of the CSIRO, the investigational resources of the Northern Division and Water Resources Council, which are part of the Department of National Development. It should *not* be part of the Northern Territory Administration.

The initial aim of an authority could be the development of five appropriately located productive units, each of 10,000 head of cattle, with subsequent expansion towards achievement of the estimated cattle potential of 2·4m. head. A limiting factor in the rate of development would be the availability of breeders and the rate of survival of their female progeny. An initial plan of this dimension would call for approximately 10,000 breeders with environmental adaptation.

From more than twenty years of research in the Arnhem region, the CSIRO has acquired the degree of scientific knowledge which would enable it to establish guidelines on which long-term plans for intensive

beef production, under a scientific pasture improvement and animal nutrition and husbandry program could be formulated. Its Land Research Division could readily undertake further intensive field studies with the object of locating priority areas for development. In addition to the aids it could render in getting such a project off the ground, an exercise of this kind could provide means of giving practical effect to the pasture improvement results of this division's research which, so far, lack translation to significant farm-scale development in the Arnhem region.

The project could be started on the Beswick Aboriginal Reserve, of 1,315 square miles, which is conveniently located in the Katherine area, adjoining the Stuart Highway and the Darwin-Larrimah railway, and within easy reach of the export meatworks at Katherine and Darwin.

Perry's pasture map indicates that more than half of Beswick Reserve would be suitable for Townsville stylo pasture.[4] A more detailed survey would indicate the whole extent of its suitability. I estimate that there is sufficient pasture improvable land in this reserve to carry 50,000 head of cattle.

I do not suggest that the Aborigines have the knowledge, at present, for the direction of development and management of such an enterprise. They have never been given the opportunity for training that would fit them for this. But they have provided the greater part of the Territory's cattle industry workforce for nearly a century, and have demonstrated their aptitude for many of the tasks involved in the development and management of an efficient cattle enterprise, given the requisite training.

At the outset, skilled personnel would be required for the planning and supervision, at all levels, of the suggested project. There are many with the requisite skills, of whom sufficient would offer to fill the required positions, provided salaries and conditions of employment were attractive.

A 'crash program', aimed at achieving spectacular results in the short term, would be unrealistic. An Aboriginal Affairs Authority of the kind suggested would do well to accomplish the first, 50,000 cattle, phase of a full program in ten years. It would do very well to accomplish the whole program in thirty years. Beginning with 5,000 breeders in the second, and

[4] R. A. Perry, 'Pastoral Lands of the Northern Territory'.

a further 5,000 in the third year from commencement, it could start to market turn-off in the fifth or sixth year. The rate of development would be governed by the availability of breeders and skilled labour.

As to capital requirement, the Budget (p. 153) provides some indication of the amount that would be involved in getting the project under way. Establishment costs would approximate $A100 per beast-area, made up of:

Fencing	$A 7
Water supply	7
Yards and dips	4
Buildings	5
Plant and equipment	5
Timber treatment	10
Seed, fertiliser, and sowing	39
Foundation livestock	23
Total	100

Thus, the initial capital involved would be of the order of $A5m.

With achievement of the first phase of development, the net on-station return from a 10,000 head annual turn-off at $A100 a head, allowing for operating expenses at $A10 per head of cattle carried (including full wages for all Aborigines employed), would be $A500,000. From this point onwards, the venture should generate sufficient capital from surplus earnings to finance full development. As well as providing adequate training and wages for Aborigines employed, the all-round standard of living of Aborigines connected with the development should be high.

At a rate of one employed Aboriginal to 600 head of cattle carried, the Aboriginal workforce at full development would be about 4,000, compared with 1,300 presently employed in the operation of the Territory's average cattle number of 1·1m. Assuming a wife and an average of three children per person employed, the total of Aborigines involved would be about 23,000.

At the point of full development, 2·3m. head of cattle at a mixed-herd value of $A50 a head would represent $A115m. The value (at full maintenance) of structural improvements, improved pasture establishment, plant and equipment and horses, at $A73 per beast-area, would be $A168m. — a total capitalisation of $A283m.

Active steps ought immediately to be taken towards development of this particular cattle potential. Practical impetus should be given to the Commonwealth government's 1968 declaration of intention to develop the Aboriginal reserves for the benefit of Aborigines and, particularly, to the views of the Minister in charge of Aboriginal affairs.

Lacking positive action, a vast beef potential will remain untapped. The setting of an example to non-Aboriginal landholders of how they can profitably develop their part of the cattle potential will have been missed. The full effect of the statement made by Mr McEwen as Minister for the Interior in 1939, which indicated that future policy regarding Aborigines would be based on the 'raising of their status so as to entitle them by right and by qualification to the ordinary rights of citizenship, and enable them and help them to share with us the opportunities that are available in their own native land' will still be denied in an environment where it could effectively be applied.[5]

Australia is not alone in its obligation to make adequate reparation to its remaining Aboriginal inhabitants, and to take appropriate measures to assure for them living standards and all-round advancement opportunities at least equal to those available to non-Aboriginal Australians.

When the United States accepted Alaska as its forty-ninth state, it inherited a similar obligation in respect of Alaskan Aborigines. America's appreciation of her responsibilities, and the measures by which she proposes to discharge them, can be seen in the following extracts from the report of a *Washington Post* correspondent published by the *Australian* of 17 July 1970:

> After three years of committee hearing and two days of floor debate, the U.S. Senate yesterday approved a unique and historic measure resolving the claims of Alaska's Aboriginals to their native land.
>
> By a vote of 76-8, the Senate approved payment of $890 million and transfer of more than 10 million acres of land to the 80,000 Indian, Eskimo and Aleut peoples of the nation's northernmost State.
>
> The settlement amounts to 2 per cent of Alaska's land area and $11,125 for each native. . .
>
> Final passage of the measure by both Houses of Congress would also clear the way to further commercial and industrial development of the

[5] Commonwealth of Australia, *Annual Report on the Northern Territory*, 1964-5.

United States' second youngest State, now in the midst of a major oil boom on its Arctic north slope. . .

The Senate debate over the bill, called the Alaska Native Claims Settlement Act of 1970, focused both on the equity of the settlement and how the State's untapped mineral resources can be opened to exploitation.

Under the Act, the $890 million will be used by two native agencies for investment projects benefiting natives, for loans and grants for health, education and welfare as well as for job training programmes.

The full-blood Aboriginal population of the Northern Territory is approximately one-fourth of Alaska's. Development of the pastoral resources of Arnhem region Aboriginal reserves alone would assure them of adequate living standards and advancement opportunities at a cost far less than a quarter of the $US890m. proposed to be awarded to Alaskan Aboriginals.

If the resources of the Arnhem region Aboriginal reserves should be exploited mainly for Aborigines, substantial royalties from the current Groote Eylandt and Gove Peninsula mineral development should be at least adequate to finance development of the pastoral resources of the Arnhem region Aboriginal reserves, without any drain on Commonwealth Treasury funds.

As to Aboriginal land rights, the Minister for Aboriginal affairs is on record as having stated in parliament that 'Arnhem Land should be thought of as belonging to the Aboriginals, and should be exploited for the interests of the Aboriginals primarily and of nobody else'. In my opinion, none could deny this. I estimate that of the 520,280 square miles of the Territory, 300,000 square miles can be occupied under pastoral lease, of which approximately 250,000 square miles are usable lands. Additionally, of the 43,615 square miles of Arnhem region Aboriginal reserves, approximately 30,000 square miles are usable for cattle raising. Thus, the usable lands of the Arnhem region Aboriginal reserves would represent about 10 per cent of the Territory's total, but the value of its production, at full development, would represent 40 per cent of the Territory's total by the turn of the century.

THE PROSPECTS FOR IRRIGATION

Drought is a positive hazard in northern Australia, some parts being particularly vulnerable, e.g. the Centre and Channel regions. In 1970

most of Queensland's central and western areas were in the grip of one of the worst droughts ever recorded in this State. The western part of the Barkly region was also affected.

In previous droughts of comparable severity little could be done to mitigate their effects. The closing of stock routes because of lack of grass and water often prevented the overlanding of cattle to relief areas. Road transport of cattle was not a common practice, facilities not then being available. Only those within relatively short distance of rail trucking points could move their cattle to agistment areas. There was little demand for store conditioned cattle for fattening elsewhere. Crippling stock losses were a common feature of drought, particularly where there were insufficient stock watering points.

But in the 1970 drought, two important factors — road transport facilities afforded by the beef roads program and the United States market for lean beef of manufacturing quality — made it possible to avoid heavy stock mortality with consequent financial loss. It was possible to move valuable breeders to relief areas for agistment and cattle of manufacturing quality to slaughtering points. These favourable factors operated to avert losses which, otherwise, would have been inevitable. (Bureau of Census and Statistics, Brisbane, Bulletin No. 420 of 1970, shows a fall of only 277,000 head of Queensland's 1969 total — beef and dairy — cattle number.)

The occurrence of severe drought in the north invariably gives rise to public discussion of the need for major water conservation schemes for drought alleviation (drought-proofing is currently the favourite term). But the history of such schemes in southern Australia shows that these have made no significant contribution to the alleviation of drought in areas lacking irrigation. Certainly, there are manifold benefits for farmers and graziers having access to water for irrigation, by gravitation, from major storages in New South Wales and Victoria. But it is also certain that they, too, suffer from the effects of drought, even if in lesser degree than those lacking such benefits.

The purpose of irrigation is, in large measure, to supplement rainfall. In the irrigated areas of New South Wales, where water is available for irrigation by gravitation from the Murray-Murrumbidgee-Lachlan river systems, where 'extensive' irrigation is practised, the average annual

rainfall varies from 12 to 18 inches. Farm sizes in established irrigation areas, used for cereal cropping and livestock production, are generally of 500-1,000 acres.

Taking so-called large area farms in the Murrumbidgee Irrigation Area as an example, such farms, of 500-600 irrigable acres, would have fixed (i.e. legal) water rights of 100-150 acre-feet a year with availability of additional water according to the capacity of the dam storages. In seasons of normal rainfall in the catchment areas, with an abundance of stored water, the annual usage of water on a farm growing rice and other cereals and carrying animals (predominantly sheep) on irrigated pastures would equal about one acre-foot per acre irrigated — 500-600 acre-feet overall, supplementing average annual rainfall of 14 to 16 inches in the Murrumbidgee irrigated areas. But under severe drought conditions, with consequent greatly reduced water levels in major dam storages, and corresponding restriction of water supply to near the fixed water right, the quantity of irrigation water available, combined with below average rainfall, could well be insufficient to mature crops and maintain normal livestock numbers on irrigated pastures. Reserves of hay and grain to supplement inadequately irrigated sown pastures may be barely sufficient for the maintenance of existing livestock. In these conditions, there could be no question of taking drought affected stock on agistment. If a farmer had surplus feed he would more likely purchase drought affected stock at low prices. If he had a marketable surplus of hay or grain, this would not be sold at less than ruling prices for similar produce available from other sources. The same applies in other irrigation areas of the south and would also apply in irrigation areas of the north.

The role of major water storages in the south is also important in maintaining the flow of rivers from which landholders with river frontages, outside of irrigation areas and districts, can obtain pumping licences from State authorities for small- to medium-scale irrigation, subject to the imposition of restraint in times of water shortage. The entire cost is borne by the landholders, who benefit from licence to pump water for private irrigation in annual quantities varying from hundreds to thousands of acre-feet. This stabilises livestock production and increases normal season carrying capacity and enables the build-up of fodder reserves for use in time of drought.

An important aspect of southern irrigation production is the wide scope for economic diversification. Taking, again, the Murrumbidgee Irrigation Area and associated districts (approximately 780 square miles) for example: the total value of production for the 1968-9 period was $A31,171,563 ($A1,036,063 below the record figure of the previous year) exclusive of the adjoining Coleambally Irrigation Area. Diversification of production can be recognised in the following details of 1968-9 production and value, released by the N.S.W. Minister for Conservation:[6]

	$A
Rice	8,607,525
Wheat	1,864,432
Oats	81,000
Livestock and livestock products (combined)	10,222,445
Horticultural products (canned and dried fruits, citrus, wine and table grapes, etc.)	8,165,822
Vegetable production	1,459,829
Other production	770,510
Total	31,171,563

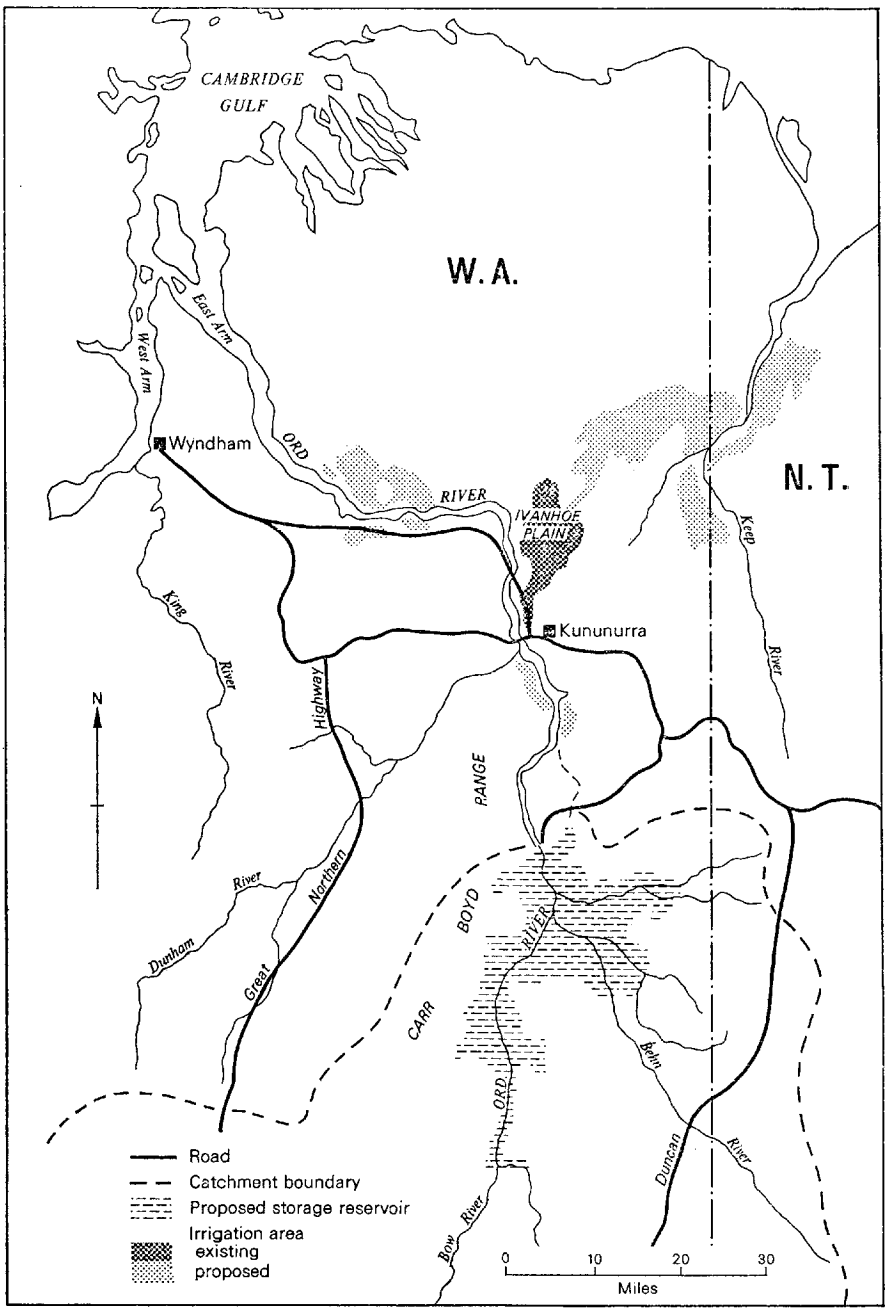
An important factor of irrigation economy in southern Australia is the soil building effects of leguminous pastures — lucerne, clovers, etc. — which combine to improve soil structure and nitrogen status, enabling substantial increase in livestock and cereal production. The importance of leguminous pasture in rotation with ricegrowing is amply reflected in the increase of the average yield of 1·8 tons in 1927 to 3·03 tons per acre in 1968.[7]

The Ord Scheme

It would be misleading to consider the feasibility of major State or Commonwealth sponsored water conservation and utilisation possibilities for northern Australia in the light of production diversification opportunities in southern Australian irrigation schemes. On known tech-

[6] Parliament of New South Wales, *Annual Report of the Water Conservation and Irrigation Commission*, p. 17, 1968-9.

[7] *Sydney Morning Herald*, 31 Dec. 1969. 'Australia Retains World Lead on Rice Yields. The manager of the Rice Marketing Board yesterday released analysed yield figures: Australia's overall average production for last year had been 3.03 tons an acre. This represented a doubling of output in 15 years.'



MAP 6 *The Ord River Scheme*

nology, this would not be applicable to remote regions of the north. The northern environment is unsuited to the wide ranging types of irrigation production common to the south. Classic examples of this unsuitability are to be seen in the initial attempt to establish economic rice production, and to develop suitable leguminous pastures for cattle raising under large-scale irrigation in the Ord and Fitzroy River valleys, in the Kimberleys, and in the Humpty Doo project, on the Adelaide River, in the Northern Territory (maps 4, 6).

The possibilities of damming the Ord for irrigation purposes have been actively advanced by Western Australian governments over the past thirty years, and were the subject of consideration in 1945 by the N.A.D.C. The recommendation of the N.A.D.C. for the establishment of a Kimberley Research Station, operated jointly by CSIRO and the Western Australian Department of Agriculture, as a necessary preliminary to consideration of the major Ord River Scheme, was acted upon and the station was set up in 1946. Its major purpose was irrigated crop and pasture research. Over the ensuing period up to the present, much scientific effort and some millions of dollars have been expended in research and experiment aimed at forms of economic production suited to irrigation purposes in the Ord-Victoria environment. So far, suitable leguminous pastures for cattle grazing have not been discovered, but crops with good production prospects resulting from research have included sugar and cotton.

Experience of recent years, however, indicates that the unfavourable economic outlook for sugar would rule out this form of Ord River production despite the prospect of even better than Queensland yields. The results of early experiments in ricegrowing were unpromising.[8]

[8] The *Financial Review* of 8 April 1969 reported that millions of acres of pastoral country were being bought by American interests in the Kimberley region of Western Australia, including the Camballin irrigation scheme on the Fitzroy River. The following reference was made to rice: 'Camballin was controlled by Northern Developments Ltd., which for years tried unsuccessfully to establish commercial ricegrowing.'

Northern Developments Ltd, a subsidiary of Associated Rural Industries Ltd, was granted a 2,400-acre holding under the Ord River pilot farm scheme and concentrated on ricegrowing. The venture did not succeed, and the farm was sold to its present holders — Hooker Corporation Ltd, Sydney — its present use being mainly for cattle fattening on irrigated crops and pastures.

Irrigation pasture research and experiment over 25 years to 1970 had not evolved a leguminous pasture with adaptation to the environment and of economic suitability for cattle grazing.

Against this background of inadequate research results, the Commonwealth government decided in the early 1960s to provide the finance for the construction of a diversion dam on the Ord River, of 80,000 acre-feet capacity, to provide water supply for a pilot farm scheme covering approximately 47 square miles, of which 40 square miles were allocated for thirty pilot farms. The purpose was to test the economics of irrigation with cotton as the main crop at the outset, over a period of sufficient duration to enable a sensible decision to be made as to whether the construction of the main dam and development of the whole scheme could be justified.

The estimated capacity of the main dam, at active conservation level, was 4·6m. acre-feet. Full development would involve water supply for an additional 237 square miles of suitable, commandable land bringing the gross irrigable area to about 275 square miles. A period of ten years would have been reasonable for testing the economics of various crop and pasture production under the pilot farm scheme (map 6).

Pilot farm testing has not yet produced results that could justify the major scheme. The viability of cotton growing as demonstrated by the pilot farm operations would be doubtful lacking substantial subsidy. Attempts at commercial ricegrowing by Northern Developments Ltd, a subsidiary of Associated Rural Industries Ltd (Sydney), to whom 4 square miles of the pilot farm area was allocated, failed. Oil seed production — safflower — was tested in a small way but with unpromising results.

On the eve of the 1967 Senate election, and with the pilot farm scheme only in its fourth year, the Commonwealth government decided to provide finance to enable the Western Australian government to proceed with the construction of the main Ord River dam, 30 miles upstream from the diversion dam at Kununurra, and to the Queensland government for the construction of the Nogoa River (Fairbairn) dam in the Emerald district of central Queensland. Neither before nor since 1967 has any feasibility study of either scheme produced evidence of economic justification. The future of the Ord River Scheme and its purpose of effective closer settlement are still matters of considerable doubt.

The nature of confused thinking about the Ord scheme is reflected in an article by the Department of Public Works, Western Australia, published in the September-December 1968 issue of *The Living Earth* (Journal of the Conservation Society of New South Wales), and in a reply by the then Minister for National Development to a question by the Leader of the Opposition in the House of Representatives on 23 April 1969. In the article, under the heading 'Benefits Resulting from the Project', were the following references:

(a) Cattle Industry

The Bureau of Agricultural Economics has calculated that 12% of the total herd in the Kimberleys is marketed each year and 11% dies. On this basis some 60,000 cattle die annually in this area which on prices that have been obtained are worth more than three and a half million dollars [approx. $A60/head].

Small scale trials at the Kimberley Research Station indicated that a large proportion of this annual wastage could be prevented by the provision of a protein ration to supplement the natural feed towards the end of the dry season. Experiments at Argyle Station have confirmed this. . .

(b) Cash Crops

One of the benefits derived from the Project so far has been the development and commercial growing of various crops. The most important crop is cotton and new methods and types are being constantly tested. The latest varieties have done well under experimental and commercial conditions and are confidently expected to increase yields. . .

During the 1966-67 wet season the area of crops grown on the thirty-one farms were as follows —

Crop	Area/acres	Yield/acre
Cotton	11,806	752 lb lint
Grain sorghum	55	approx. 2 tons
Wheat	77	approx. 46 bushels
Total	11,938	

An alternative or supplementary crop which can be grown very successfully on the Ord is grain sorghum. The K.R.S. has been experimenting for 4 years with this crop and much has been learnt about the cultural practices which contribute to its successful growth. It has been established that both 'wet' and 'dry' season crops can be grown and that second and third crops, by ratooning, can also yield well. The agronomy of growing the crop, however, has not been fully worked out . . .

Investigation into these and other crops such as maize and soya beans are under continuous review with the intention of developing further crops when this is feasible.

In my opinion, these and other production possibilities should have been thoroughly tested under pilot farm conditions before a decision was made to finance the major scheme.

A further example of the woolly thinking that has characterised premature consideration of the Ord River scheme is clearly evident in Mr Fairbairn's reply to Mr Whitlam's question on whether Ord water would be available for use in the Northern Territory.

> It is true that of the land which can be irrigated from the Ord when the main dam is completed something like one-third lies in the Northern Territory. So far the Commonwealth has not considered this matter, but it will undoubtedly have to consider it in the fairly near future. A considerable amount of work, not only in building the dam but also in building channels, must be undertaken before there is any extension of irrigation into the Northern Territory area . . . Speaking from memory, I believe the main dam will not provide water until 1973, or possibly 1972 . . . With channels to be built and the area to be developed it is not anticipated that there will be any extension into the Northern Territory until a number of years later. However, I believe the Government will look at this matter fairly shortly.[9]

It seems extraordinary that, having in 1967 provided for the financing of the major Ord River scheme, on the inadequate data then available on other crops to supplement a subsidised cotton monoculture on which alone the scheme could not hope to succeed, the Commonwealth had not, even as late as 1969, considered what was to be done with the one-third of the scheme's 275 square miles lying in the Northern Territory.

The only positive suggestion so far advanced as to how the Ord scheme could be of direct benefit to the cattle industry is that with the extraction of cottonseed oil the residue could provide a much-needed supplement to the protein deficient native pastures of the region. But, again, no study has provided compelling evidence of the economic feasibility of this form of supplementation. Meantime, the cottonseed is exported to Japan, the reason being that, due to the uncertain economic future of Ord River cotton production, no commercial concern or government instrumentality appears willing to invest as much as $A1m. in an oil extraction plant, without which there could be no such supplement available for feeding to cattle.

[9] *C.P.D.*, Vol. 62, H. of R., p. 1353, 23 Apr. 1969.

In July 1967, I attended a meeting of Ord River farmers at Kununurra when proposals for diversification of production were discussed. The most promising prospect that emerged was in the fattening of store cattle on irrigated crops, with farm-produced grain and other supplementation. In a later visit to Kununurra, in October 1969, I saw approximately 2,000 head of cattle in this process but the economic feasibility of the project had yet to be established.

Further indications of the uncertain future of the Ord River scheme were contained in press criticism such as an article in the *Australian Financial Review* of 11 November 1968, which referred to Mr Fairbairn as having stated that

> The decision to provide funds [for the main dam construction] was taken only after long consideration of the costs and benefits of the scheme . . . The proposal . . . was based on the fact that vast untapped resources of water were available in the area. . . The cost of the water impounded by the main Ord dam would be by far the cheapest in Australia — $A21 per acre-foot compared with $A135 per acre-foot for the Keepit Dam on the Namoi River in N.S.W. In addition the Ord has good flood plains which could be commanded by gravity and a good long growing season.[10]

The *Financial Review* commented:

> These arguments are of the crudest type used by the traditional advocates of northern development at any cost.
>
> The facts to be considered are that Australia's cotton requirements are being met by more efficient growers in the south and a suitable second crop has not been found for the Ord despite 20 years of costly research.
>
> Export markets are so dicey that Ord growers will probably require increasingly heavy subsidies to remain in the area, otherwise the big pastoral companies will move in and pick up the pieces.

On 14 November 1969 Mr Court, Minister for Industrial Development and the North-West, replied to this criticism:

> The State Government of Western Australia advocated the Ord scheme fully understanding the difficulties it would bring.
>
> We are fortified by the fact that at least one Federal Minister in the person

[10] The water storage capacity of the Ord River dam will be 4·6 m. acre-feet (*The Living Earth*, Sept.-Dec. 1968, p. 18), that of the Keepit dam is 345,300 acre-feet (*Annual Report of the N.S.W. Water Conservation and Irrigation Commission, 1968-69*, p. 37).

of the Minister for National Development has not only had the courage to back the scheme right through, but during the present period of criticism is prepared to declare himself strongly in favour of the project.[11]

These criticisms and comments serve to underscore the validity of doubts that may have been cast on the Ord River scheme, based on its possibilities of effective large-scale closer settlement under direct government sponsorship. Already one big pastoral company has shown interest in moving in for large-scale private development. The *Australian* of 25 July 1969 reported:

> Hooker Corporation Ltd, Sydney, has taken a dominant role in an international consortium which could spend at least $A4 million in the 1970s on a farming and cattle project in the Ord Irrigation Area . . .
>
> Other partners would be Hawaiian Agronomics Co, Honolulu (24.5 per cent) and Mitsui (Australia) Ltd, (24.5 per cent). . . [51 per cent being held by Hooker.]
>
> If the results of the survey are satisfactory . . . the consortium will negotiate with the W.A. Government for an area of up to 30,000 acres in the Ord Scheme to allow large-scale farming activity . . .
>
> It is planned that within a 'given period' after full development of the area allocated that 50 per cent of the farming land will be made available for closer settlement. . . .

The fact that the government of Western Australia has sanctioned this proposed private development is evidence of its growing doubt regarding the Ord scheme's feasibility for closer settlement.

Other Kimberley Irrigation Schemes

Another premature Kimberley irrigation venture of the early 1960s was the Camballin project (map 4), covering 31 square miles of privately held land for which the Western Australian government constructed a water storage of substantial capacity, the landholders being Northern Developments Ltd. For some years, this company attempted to establish commercial ricegrowing. A modern rice mill was installed and harvested rice was exported to Asian countries. The managing director of Associated Rural Industries Ltd (of which Northern Developments Ltd was a subsidiary) was qualified to handle the business side of the venture, having had many years experience of handling rice. The manager of

[11] *Financial Review*, 14 Nov. 1968.

Camballin was experienced in ricegrowing, having been a successful ricegrower in the Riverina. Nevertheless, the venture failed through inability to produce adequate yields.

A large woolgrowing property, Liveringa Station of 1,015 square miles of which Camballin had originally been part, was purchased by Associated Rural and operated in conjunction with Camballin. Ricegrowing at Camballin was abandoned in 1966. In 1969, Camballin, together with Liveringa, was sold to American interests — Australian Land and Cattle Co. — for an undisclosed sum. A director of the new holding company was reported to have expressed the following opinion:

> The potential of the Fitzroy basin [W.A.] equalled that of the Rio Grande Valley in Texas, where grain sorghum, vegetables, citrus and cotton provided a diversified agricultural industry supporting a million people.[12]

It has been estimated that up to 637 square miles could be irrigated by a dam erected on the Fitzroy River. A dam at Diamond Gorge could provide storage of about 3m. acre-feet and one on the Margaret River, about 400,000 acre-feet.[13]

Another recent entrant in the Kimberley private irrigation field is W. R. Goddard, an American who now holds the lease of the 1,562 square mile Dunham River Station, situated to the south of Kununurra. Construction of a first-stage dam has been completed with an estimated storage capacity of 55,000 acre-feet on Arthur Creek — a tributary of the Dunham River in the Ord River system — in a pilot operation to serve ten 1,000-acre irrigation farms. The contemplated second stage involves a major dam on the Dunham River. The two stages will encompass forty-four irrigation farms averaging 1,000 acres, probably with associated areas of non-irrigable land. Under an agreement covered by special enabling legislation enacted by the Western Aust-

[12] Ibid., 8 Apr. 1969. See also 'Big Cattle and Sorghum Plan', *Canberra Times*, 14 July 1970: 'The Australian Land and Cattle Company expects to produce 30,000 cattle and 500,000 tons of grain sorghum a year from its irrigation project at Camballin, according to the Company's managing director. He made the announcement at Camballin on Sunday during an inspection by the Minister for National Development.'

[13] *Northern Times* (Carnarvon, W.A.), 25 Sept. 1969, 'Facts on the North'.

ralian government, half of the farms are to be disposed of for closer settlement, the remainder being retained by the promoter.[14]

The first phase of this project has been advanced to the point where one farm has begun irrigation, using a giant spray method. During a brief visit to the project in October 1969, I observed this operation with cattle being grazed on an irrigated oat crop. The main productive purpose envisaged is cattle fattening on fodder crops, such as sorghum and oats, with the aid of grain and other supplements. The economic feasibility of cattle fattening in large-scale private irrigation ventures in the Kimberley environment is doubtful, owing to the high dam construction and irrigation channel cost and consequent high cost of farm production. Large-scale irrigation projects (e.g. the Hooker consortium and the Australian Land and Cattle Co.) drawing water from the government-constructed Ord and Camballin storages will be more favourably placed since they will not have to bear any of the dam and supply channel construction costs, other than the proportion included in water supply.

WATER CONSERVATION

If there were a significant prospect of dry-season and drought alleviation through irrigation in northern Australia, it would be rather in small-scale schemes on cattle stations, such as that installed on Victoria River Downs (see p. 169). Similar opportunities exist on many northern cattle stations using as sources of supply permanent waterholes or small dams on major or minor streams, and sub-surface supplies, such as the shallow Mereenie reservoir in Centre region to the south of Alice Springs.

The effective conservation of water and its utilisation in northern Australia is part of a major problem that confronts the governments of all States and the Commonwealth. So far, consideration of this problem has been of a piecemeal nature. There is a need for the creation of a national water resources organisation, broadly on the lines of the Australian Agricultural Council.

This council comprises the State Ministers for Agriculture or Primary Industries, under the chairmanship of the Commonwealth Minister for

[14] *Australian*, 17 Feb. 1969.

Primary Industry. Its purpose is to deal with problems of agricultural production and marketing common to all States and the Commonwealth. It has functioned effectively, with the support of a representative standing committee.

In 1937, a conference of Commonwealth and State Ministers for Agriculture agreed that water conservation and irrigation were national problems. Subsequently, the New South Wales government communicated with the Prime Minister and other States requesting a conference to discuss water conservation and irrigation and to agree to uniform proposals for the conservation of water. This did not eventuate.

A 1939 convention of Murrumbidgee water users unanimously endorsed two proposals: the first urged an investigation of the practicability of tapping the Snowy River waters, by the construction of a dam at the junction of the Snowy and Eucumbene rivers and the channelling of the diverted water via a tunnel through the Divide to supplement the Burrinjuck storage; the second urged the creation of an Australia-wide Water Conservation and Hydro-electric Authority.[15] The first led to the great Snowy Mountains Scheme, now nearing completion; the second has for long been ignored.

The need for a national water conservation authority is no less urgent now than it was thirty years ago. If it had existed over the past fifteen years, the decision of 1967 to sanction early construction of the main Ord River dam would probably not have been made. During a debate in the Commonwealth Parliament in April 1970, Dr R. A. Patterson, the Opposition 'shadow minister' for agricultural affairs, urged the creation of a national water conservation authority.[16]

If the existing considerable hydrological knowledge and water conservation utilisation 'know-how' of the State and Commonwealth instrumentalities concerned can be pooled in a concerted appreciation of Australia's water resources and their effective utilisation, under the direction of a properly chartered national authority, this will be to Australia's advantage. It will certainly provide the hydrological knowledge essential to mature consideration by governments in deciding on

[15] J. H. Kelly, *Struggle for the North*, 1966, pp. 96-7. See also *Sydney Morning Herald* and *Wagga Daily Advertiser*, 16 Jan. 1939.

[16] *C.P.D.*, Vol. 4, H. of R., p. 835, 8 Apr. 1970.

the most effective measures and appropriate priorities for conservation and utilisation of northern water resources in the overall Australian picture.

FUTURE DEVELOPMENTS

In planning for the future development of the beef resources of northern Australia, it is important to recognise that the primary concerns involved are those of the Australian people. Most of the lands involved are held under lease from the governments of the Commonwealth, Queensland, and Western Australia as custodians of the public estate. It is fundamental to sound trusteeship that lands held under lease be effectively occupied and protectively utilised. The Commonwealth government has an obligation to set an example to the States of Queensland and Western Australia by the effective administration of the Northern Territory sector of the public estate.

Progressive closer settlement, leading to optimum utilisation of pastoral and agricultural resources, has been the aim of lands administration policies in Queensland throughout this century. In the case of leaseholds of large areas held by individuals or pastoral companies, there is provision for resumption of a proportion of the land during the currency of the lease, but no assurance of lease renewal upon expiry.

Influential pressures exerted upon Queensland governments in recent years on behalf of both Australian and overseas absentee holders of vast areas of cattle country, seeking leases of longer duration with privilege of renewal and without provision for resumption have been firmly resisted. Efforts to deflect this course of Queensland land administration have failed.

Queensland land administration has been liberalised during the 1960s to the extent of providing for the freeholding of certain areas of efficient productive size, subject to firm conditions of land and structural improvement. This applies to farms allocated or purchased under the Fitzroy Basin Brigalow Lands Development Scheme. Freeholds have been granted in other isolated instances, such as the Caloundra Pastoral Company wallum lands, 17 square miles; King Ranch Company-Tully River area, 79 square miles; Lakeland Downs Company-Cooktown area, 94 square miles, all subject to stringent improvement conditions.

Whilst the financially unaided development by the Queensland government of the high cattle potential of Peninsular region is unlikely in the short term, the Lakeland Downs example of substantial private investment in development of an area of relatively small size towards a high productivity is one that might well be followed by other holders of Peninsular cattle lands. Lacking this, there are sound reasons for promoting a major State sponsored Peninsular development, based on closer settlement on the lines of the brigalow development scheme, if financial aid of a like nature were forthcoming from the Commonwealth government.

Queensland's public estate administration shows greater regard for the public interest than does the Commonwealth in respect of the Northern Territory or Western Australia in respect of the Kimberleys. If Queensland's future lands administration policies continue in pursuit of the present progressive aim, it is likely that the greater part — perhaps the whole — of the cattle lands will be effectively occupied and utilised before the turn of the century and that the State's beef cattle numbers will have reached my estimated potential of 21·3m. beef cattle before then.

The greater part of the Territory cattle potential is in Arnhem-N.T. Gulf regions. This has been variously estimated at from 2m. to 12m. head of cattle. Three estimates were made in 1969: The Minister for the Interior, on 9 May, indicated 2m. (including Aboriginal reserves); I have estimated 4·7m.; Dr E. M. Hutton, Chief, CSIRO Division of Tropical Pastures, in his address to the Northern Territory Primary Producers' Convention, at Darwin in April, mentioned that 'in northern Australia there is an untapped resource of 260m. acres which could be sown to improved pastures and carry 60m. cattle. The Northern Territory could carry about a fifth of this number'.

In the light of my estimate of a Northern Territory cattle potential of 3·7m. (excluding 2·4m. in Arnhem region Aboriginal reserves), based on effective land occupancy and utilisation, it is important to review Territory cattle numbers, by regions, over the fifteen-year 1955-69 period since the Crown Lands Ordinance was amended in 1953 to provide for fifty-year and pastoral homestead (perpetual) leases. These numbers are shown in table 23 with particular regard to Arnhem-N.T. Gulf regions — the area of highest potential.

Table 23
Northern Territory cattle numbers, 1955-69 and author's estimated potential

Year	Cattle regions				
	Arnhem-N.T. Gulf	Victoria	Barkly	Centre	Total N.T.
1955	157,165	258,764	276,509	276,337	968,775
1956	164,692	263,220	305,879	294,028	1,027,819
1957	170,647	359,744	345,375	300,231	1,175,997
1958	187,037	343,063	368,740	353,174	1,252,014
1959	192,747	344,602	327,734	273,073	1,138,156
1960	199,298	330,461	313,142	246,081	1,110,520
1961	220,812	348,135	343,530	204,350	1,116,827
1962	204,006	334,242	339,804	176,617	1,054,669
1963	215,911	338,534	367,223	165,371	1,096,039
1964	193,686	332,640	381,265	160,130	1,067,721
1965	208,880	317,724	385,895	136,032	1,048,531
1966	206,783	311,218	398,326	134,412	1,050,739
1967	210,304	304,563	436,464	154,405	1,105,736
1968	201,000	331,000	425,000	173,000	1,130,000
1969	179,000	347,000	440,000	219,000	1,185,000
Average	194,131	338,327	363,659	217,748	1,100,190

Source: Northern Territory Administration Annual Reports and Bureau of Census and Statistics.

Despite the substantial incentive in the 1967 'rolling' lease tenure and the increase in Townsville stylo acreage to 200 square miles, Arnhem-N.T. Gulf 1969 cattle numbers were 8 per cent lower than the fifteen-year average to 1969.

On the evidence of such poor performance, under a system which permits the absentee holding of the bulk of the cattle potential, without leasehold pasture improvement conditions, the likelihood of the Territory's cattle potential being achieved within this century is remote.

The enactment in 1953 of the pastoral homestead lease tenure followed a most exhaustive study by a committee with expert knowledge, representing the Department of Territories (then responsible for Territory administration), the B.A.E., and the Northern Territory Lands Administration. It provided that the area of a pastoral homestead lease should not substantially exceed efficient productive size in defined regional herd size terms (see p. 35), and that the holder could not have a

beneficial interest in other Territory pastoral or agricultural land. If the whole of the Territory cattle lands had been occupied under this tenure, achievement of the Territory cattle potential would have been well advanced by 1970.

Having regard to the interests of the Australian people as a whole, and considering the obligations of proper governmental trusteeship of the public estate in the Northern Territory, there is a strong case for repeal of Ordinance No. 2 of 1967. This would not constitute an act of repudiation, since an extension of an existing lease cannot be considered until applied for after 1973 (the first 50-year lease was granted in 1954). If repeal of the pastoral homestead lease tenure was valid in 1967, repeal of the 'rolling' lease provision would also be valid in 1970, as would be repeal of the freeholding provision under which 312 square miles could be held by a single interest.

A practicable measure by which the estimated 2·4m. Arnhem-N.T. Gulf cattle potential (excluding Aboriginal reserves) could be developed would be through a Commonwealth government-sponsored closer land settlement scheme on the lines of the Queensland brigalow development scheme, on the basis of pastoral homestead lease tenure, with holdings capable of carrying, at full development, herds of 9,000 as formerly prescribed for the area marked 1 on the plan in Regulation 5 of 1954 (see chapter 2).

Assuming 18,750 square miles of the present occupied area of about 67,189 square miles in the Arnhem-N.T. Gulf regions as suitable for pasture improvement at a carrying capacity of a beast to 6 acres (2m. head), plus 400,000 head carried on native pasture at a beast to about 120 acres on the remaining 48,439 square miles, this would provide for about 140 units averaging about 340 square miles. Allowing for 46 units as retention areas for existing landholders, 94 units would be available for effective settlement.

Using the Budget (p. 153) as a guide, the total capitalisation of a holding of this size would approximate $A600,000 at full development. Assuming a period of twenty-five years towards full development, settlement could be adequately financed by an initial availability of half the anticipated eventual capitalisation — say $A300,000. This could be provided by a combination of a thirty-year government loan (attracting interest at not

more than 4 per cent) of $A150,000, repayable by equalised annual instalments, and a matching contribution by the landholder.

If the Arnhem region Aboriginal reserves were developed on the lines suggested, my estimated total Territory cattle potential of 6m. head, with an average annual turn-off of 1·22m. could be achieved by the turn of the century.

But on the evidence of the Territory's depressing performance in the inefficient utilisation of the pastoral resources, and of the Commonwealth government's inept performance over most of its sixty-year history of public estate administration, effective land occupancy and utilisation is unlikely under the combination of inexperienced remote control from Canberra, ineffectual local administration, and a legislative council inhibited by a firm power of veto held by the Commonwealth government.

A practicable alternative, through which the Territory's true potential could be achieved, lies in the creation of a Northern Territory Conservation and Development Corporation with adequate powers and funds for its purposes, and a fully elective Legislative Council whose measures should be subject to veto only when in conflict with the overall national interest. The purposes of such a corporation could cover the following:

The welfare and development of native inhabitants of the Territory.
Land occupancy, utilisation, and administration.
Soil, pasture, and water conservation.
Pasture improvement.
Agricultural development.
Mineral resource development.
Transport, public works and services.
Local government and public amenities.
Health and education.

The ultimate status of the Northern Territory should be independent statehood. This has been the acknowledged goal since responsibility for its future was assumed by the Commonwealth in 1910. The establishment of the Legislative Council in 1948 (even though with preponderant government-nominated membership and retention of the power of veto of any measure it passed) was an important first step towards this goal.

The time for taking the second step towards autonomy through the constitution of the suggested corporation is long overdue.[17]

The governments of Queensland and Western Australia retained their interest in the concept of a northern Australia development authority and it remained in the minds of some Commonwealth parliamentarians. One in particular, Mr E. M. Fox, Liberal Party member for Henty (Victoria) made the following contribution in the debate on the estimates in the House of Representatives on 10 October 1961:

> The problems of the beef industry, the largest industry in the north, are not confined to the Northern Territory; they exist also in the two States I have mentioned, and they must be considered in that light. The problems of transport, communications, agriculture and industry, water conservation and indeed of native welfare and education cannot effectively be considered in isolation as the problems of separate States.
>
> In 1926, the Parliament, recognizing this truth, passed the Northern Australia Act. When moving the second reading of the Bill, the then Prime Minister, Mr S. M. Bruce, had this to say —
>
> Honourable members, if they glance at the map and see the position of the Gulf of Carpentaria and the north-western coast of Western Australia in relation to the Northern Territory will understand why this scheme should ultimately include some portions of the territories of Western Australia and Queensland to obtain the best economic basis for development. . .
>
> It is almost impossible to develop a great territory like this successfully with the Seat of Government as far removed from it as it now is.[18]

The question of northern development and the creation of an instrumentality for this purpose was vigorously canvassed by the leaders of the major political parties at the Federal Election of 1963. The Leader of the Opposition, Mr Calwell, proposed a Northern Australia Development Commission, within a Ministry of Northern Development. The Prime Minister proposed the establishment of a Northern Division, within the Department of National Development, and it was established early in 1964.

In a speech in the Senate on 17 March 1964, the then Minister for National Development (Sir William Spooner) said:

[17] *Northern Territory News* (Darwin), 16 Oct. 1969, 'Political Rights Key to NT's Future'. See also *Canberra Times*, 3-4 July 1970.

[18] *C.P.D.*, Vol. 33, H. of R., pp. 1851-3, 10 Oct. 1961.

> After much deliberation and thought, based on the experience of the past, the Government reached the conclusion that the most effective method of stimulating development would be to establish a new Northern Development Division within my Department. That has been done. But that decision was reached only after the most careful thought had been given to the alternative proposal to establish either a separate ministry or a statutory authority. The decision has been made but the door has been left open for the States of Queensland and Western Australia to propose an alternative approach and to make specific proposals to the Commonwealth. They have not yet done so, although I think that as far back as last July press reports indicated that this was their intention. When they bring their proposals forward we shall consider them.[19]

Dr R. A. Patterson was chosen by the government as the first director of the Northern Division. (A logical choice in the light of his distinguished contribution to the brigalow development and beef roads schemes.) The Division was given an imposing façade upon its establishment, but little has since been heard of its achievements.

Early in 1966 Dr Patterson, in frustration because of its lack of positive purpose (he described it as being 'toothless and clawless'), resigned from the directorship of the division to contest (successfully) a by-election for the Queensland federal electorate of Dawson (he is currently the Opposition 'Shadow Minister' for Primary Industry and Northern Development.)

On 20 October 1966 Dr Patterson made the following observation in Parliament:

> In 1961 the Premiers of Western Australia and Queensland again approached the Commonwealth, seeking the establishment of a northern Australia development authority. As we now know, the Commonwealth talked them out of it by establishing the Northern Division of the Department of National Development. The Premiers were happy at the time. I assure honourable members that they are not happy now. The Government's promises to the Premiers are a matter of record, as are its reasons for stating that the Northern Division would be better equipped to deal with the problems of northern development than would a northern Australia development authority. But if we had such an authority we would have complete co-operation between the States and the Commonwealth. There would be a budget for the authority. The Commonwealth would be able to

[19] *C.P.D.*, Vol. 25, Senate, p. 312, 17 March 1964.

allocate funds in a rational way, based on priorities. We would have a steady rate of growth. The Vernon Committee, for example, pointed to the need for a special projects commission to examine and determine priorities in underdeveloped areas . . .[20]

My twenty-two year continuous study of the beef industry in northern Australia enabled me to appreciate the national advantages that would have accrued had the N.A.D.C. recommendations relative to its development, and for the establishment of some permanent body to follow up the Committee's work and give practical effect to its recommendations been adopted. Those recommendations still provide useful guidelines for development of the beef resources of the remote regions of the north and for scientific research in related fields.

In April 1966, the distinguished Australian economist, Sir Douglas Copland, chairman of the National Council for Balanced Development, stressed the need for a Northern Development Authority to promote the development of natural resources in tropical Australia.[21] He made the following points:

The first of these problems had reference to the steps required to promote a plan of development for the large areas of northern Australia still relatively unpopulated . . .

To meet the problems involved requires co-ordinated action on a large scale, involving the Commonwealth, Queensland, and Western Australian governments . . .

With the magnitude of the problem confronting Australia today, and the wide and deep variety of technological developments, it is necessary more than ever that this partnership should be fostered.

It could best be done on the basis of what has come to be known in Australia as the establishment of the statutory authority to deal with the development of the overall framework in which the economy flourishes . . .

This Northern Development Authority could be established jointly by the Commonwealth, Queensland and Western Australia and dedicated to the task of examining and planning the overall development of the resources available, and in certain cases perhaps directly undertaking the work involved . . .

The experience of the Snowy Mountains Authority and its high sense of

[20] *C.P.D.*, Vol. 53, H. of R., p. 2025, 20 Oct. 1966.

[21] Douglas Copland, *Australian*, 7 Apr. 1966, 'The Case for a Northern Authority'. See also *Canberra Times*, 10 March 1961.

dedication to the task confronting it can be drawn upon in the establishment of a Northern Development Authority.

Australia, in common with other countries, is entering upon new tasks in administration that present a greater challenge — and also greater opportunity — than ever before . . .

The way to the establishment of a northern Australia conservation and development corporation is still open. Its purposes have not been fulfilled by creating the Northern Division. The Commonwealth government should go further to establish a statutory corporation for the future development of the Northern Territory, with provision for Queensland and Western Australia to become associated if they should feel that development of their remote regions would be enhanced.

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INDEX

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