Australian Sugar Tramways

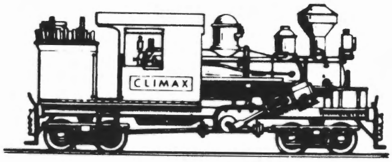
The Challenge of the 1980s

By I.R. Crellin

Light Railways
Number 66
October 1979

Published by

The Light Railway Research Society of Australia



Light Railway Research Society of Australia

COUNCIL
President, Frank Stamford
9 McGregor Street, Canterbury 3126 (830-1640)
Vice President, Phil Jeffery
52 Surrey Road, Blackburn 3130 (878-2442)
Secretary, E.G. (Ted) Stuckey
37 Wattle Valley Road, Canterbury 3126 (836-8732)
Treasurer, Mike McCarthy
30 Millers Road, The Basin 3154 (762-5847)
Publications Editor, Vacant
Committee men, John Buckland, Steve Martin, Arthur Straffen
Membership Officer, Mrs. E. Hennell
26 Karma Ave., East Malvern 3145 (211-1634)
'Light Railway News' Editor, John Browning
P.O. Box 111, Indooroopilly 4068
Meetings Melbourne: Second Thursday every second month at 8.00 p.m. at Ashburton Uniting Church Hall, Ashburn Grove, Ashburton. Next meetings: 14 February, 10 April, 12 June, 14 August, 9 October, 11 December.

New South Wales Division
Address: P.O. Box 290, Burwood N.S.W. 2134
Officers.
President, Paul Simpson
115 Lambeth St, Panania 2213 (02) 771-3929
Secresary, Dick Mason
193 Woodstock St, Dharruk 2770 (02) 625-9869
Treasurer, Alan Watson
Box 1368 G.P.O., Sydney 2001 (02) 439-7367
Meetings Sydney: Fourth Wednesday every second month at 7.30 p.m., Conference Room Rechabite House, 85 Campbell Street, Surry Hills. Next Meetings, 27 February, 23 April, 25 June, 27 August, 22 October, 10 December.

This issue has been prepared by Ian Crellin. Photographs are from the author's collection with commercial photographs acknowledged. The assistance of Leon Oberg and Ken McConville is gratefully acknowledged.
Whilst every effort is made to ensure the accuracy of articles published in *Light Railways* errors may creep in. Additional information is being discovered all the time, and this sometimes contradicts previous information.

If you see any errors, or can add information, please contact the editor, and so help us to record the full history of Australia's light railways.

Historical references to sums of money in *Light Railways* are in Australian pounds (£). One pound equalled two dollars on changing to decimal currency in 1966.

Articles and news items are always welcome. It greatly assists the editors if they are typed or written one one side of the paper only and double spaced.

Australian Sugar Tramways

The Challenge of the 1980s

by I.R. Crellin

Light Railways No. 66

ISBN 0 909340 10 2

October 1979

Above A Clyde built diesel-hydraulic locomotive shunts bulk bins in the yard of Proserpine Mill in north Queensland, 1977.
Front Cover The old and the new — Perry 0-6-2T (B/No. 2601.51.1 of 1951) steams past a ubiquitous Clyde diesel-hydraulic locomotive, at Marian Mill in the Mackay district, 1977.

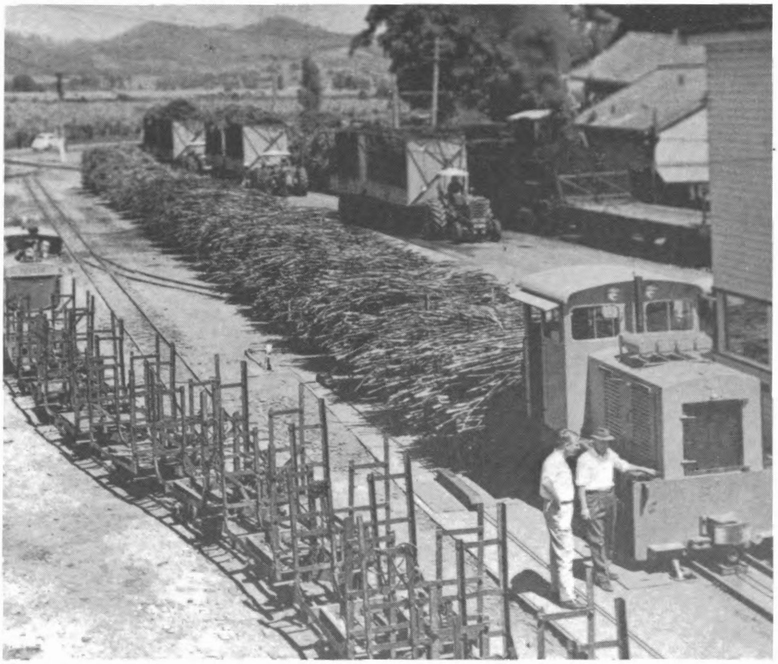


Photo: CSR Publicity

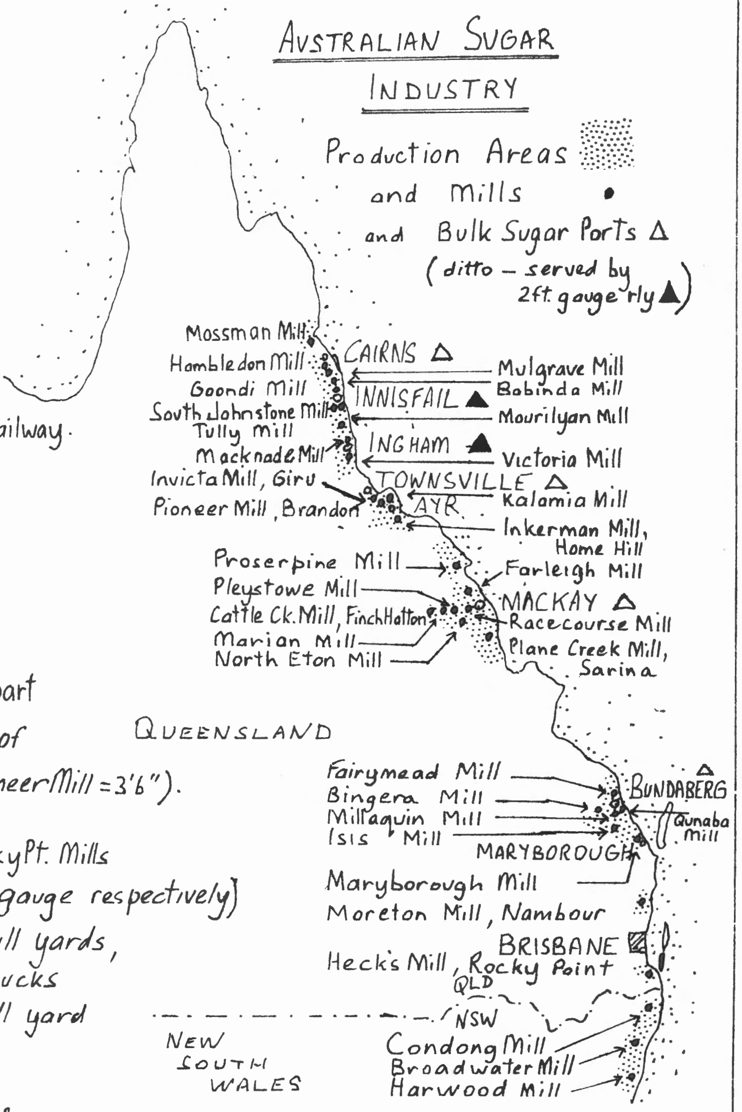
THE SUGAR INDUSTRY: AN INTRODUCTION

One of the greatest joys for the person with an interest in railways in Australia, must surely be the vast network of narrow-gauge lines in the north of the country which serve the farms and mills of the sugar industry. Each year in the winter season, millions of tons of sugar-cane are harvested and loaded onto light railways for the journey to the mill, where it is crushed and processed into raw sugar. Some of this raw sugar is then transported to port for shipment by light railway on its way to the food industries of the world. Much of the wetter coastal strip of east Australia, from Harwood near Grafton, NSW, in the south; to Mossman near Cairns, Qld, in the north; owes much to the growing of sugar for its livelihood and prosperity. Some 2000 miles of tramway, most of 2ft gauge, can be found serving the mills on this strip of tropical and sub-tropical coastline.

The industry rose from humble beginnings in the last century to its present situation where it is an advanced high-technology undertaking handling volumes of product undreamed of even in recent times. Along with the expansion, modernisation of facilities including the tramways which serve the industry, also proceeded. Today computer-assisted milling processes are found, even extending to the operation of the tramways. Scheduling is computerised at many mills and advanced technology features such as radio-controlled brakevans and locotrol-style slave locomotive operations may be found in daily operations. On the heaviest of the tramways engineering standards approach those of light-branchline operations of conventional railways. The changes in the industry have indeed been of the most profound nature.

The above illustration shows Condong Mill in the early 1960s, when changes in technologies and operating techniques were profoundly changing the canefields scene. Wholestick cane was still being harvested. Chopped cane has since become the norm. An old Fowler diesel shunts empty trucks of small capacity, while the mill's new E.M. Baldwin diesel loco is given pride of place. In the shadows a NSWR steam loco shunts standard gauge cane wagons and tractors with field trailers bring cane to the mill. Although NSWR still had steam locos in service, they have already been surplanted on the mill tramway by diesels and the spectre of road transport hovers ominously over both forms of railed transport.

Time moves on. Today, no locomotives or rails, irrespective of gauge are seen at Condong. Large road vehicles haul the cane in 20 ton containers. All other mills face the same pressures as this one. New technologies and operational techniques are being developed to meet the challenges of the 1980s for the tramways and the industry as a whole.



RAILWAY/TRAMWAY DETAILS

- Plane Ck. Mill is sole remaining mill receiving cane via a Government Railway.
- All mills except
  - Maryborough Mill
  - Rocky Pt. Mill
  - Condong Mill
  - Broadwater Mill
  - Harwood Mill

  are supplied in large part by mill tramways of 2ft gauge, (except Pioneer Mill = 3'6").
- Maryborough and Rocky Pt. Mills operate (3'6" and 2' gauge respectively) systems within the mill yards, with cane or railtrucks brought to the mill yard by motor truck.
- The three NSW mills converted to road transport in their entirity in the mid-70s.

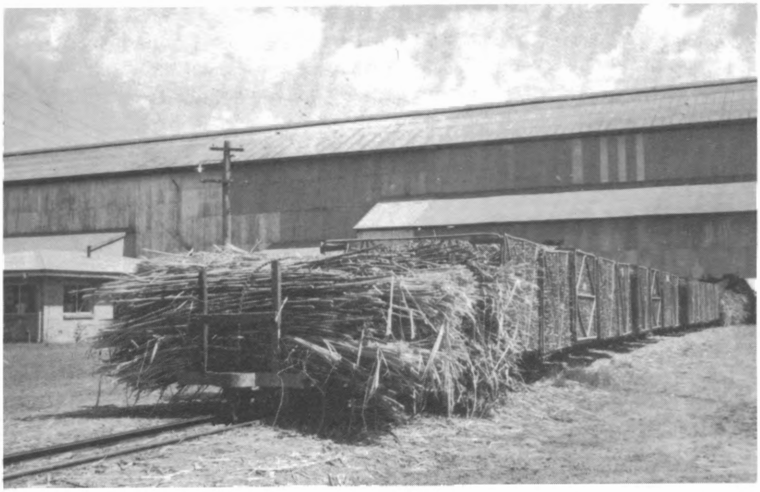
- The bulk sugar ports at Lucinda Pt., (Ingham District), and Mourilyan Harbour, (Innisfail District) are supplied by 2ft. gauge tramway. other ports are served by QGR and road.

THE SUGAR CANE TRAMWAY

The role of the tramway is primarily to haul the harvested cane to the mill for crushing. This simple view however overlooks another facet of the tramway operations which is equally important. A milling operation is a complex and integrated procedure. Processes work best when operated at a constant throughput rate. Thus the miller will attempt to tip and crush cane at a set rate, without interruption or variation throughout the plant's operating shifts. When one considers that harvesting proceeds for most of the day (once any excess moisture has dried from the fields), that tramway movements arrive at the mill at intervals and that the mill requires a continuous supply of cane through its crushers, then we see the tramway provides an important inventory function in the supply chain of the mill. Without the tramway and its ability to hold and move the harvested cane as required, a regular and continuous supply of cane into the milling process would be difficult to obtain. Indeed, some mills which do not use tramways for cane transport, have installed small tramway systems in their mill receival yards for this very function.

The tramway delivers wagons to the sidings near the farms. These are loaded by the farmers as harvesting proceeds and are hauled to the mill by locomotive some time after harvesting. A stock of loaded wagons is maintained in the mill yard awaiting crushing and these are brought forward to the tipper to provide the mill with a constant rate of cane through the crushers. Thus by varying the inventory of filled trucks in the mill yard, a stable processing rate can be maintained, despite the irregular arrival of loaded trains. Likewise at the farm end, harvesting can proceed at its own pace, storing the cut cane in the tramway wagons until the locomotive arrives to haul it to the mill. Road transport can perform most of the tasks of an equivalent tramway, but it is impractical to hold expensive trucks in queues at farms or mills, or alternatively, dump and rehandle cane, to get the high utilisation rates needed to make road vehicles profitable for their operators. One of the more interesting combinations of the two types seen by the author was at Lautoka Mill at Fiji. Here, the day shift works mainly on road deliveries and the night works on rail wagons. During the day motor trucks deliver from nearby fields with little delay, directly to the tipper. When a gap in the procession of trucks occurs, a rail wagon is winched up to the tipper to keep up the supply to the crushers. The outlying areas supply cane by rail. This is accumulated during the day and held for the night when road transport does not operate. By utilising the characteristics of each system, a joint operation ensures even supplies of cane through the crushers in both operating shifts, with a minimum cost associated with holding-up expensive road delivery trucks. This illustrates the advantage of the tramway in providing a service enabling an irregular input e.g. harvested cane, to become a regular input e.g. cane delivered to the crushers. This is done without the need for double-handling or tying-up expensive equipment in waiting lines.

All businesses are faced with breakdowns and natural calamities from time to time. Tramways by their nature, are fixed. When any problem occurs, cane cannot easily be redirected to other mills for processing. In 1976, two adjacent mills in the Ayr district even considered laying a temporary line across the bed of the Burdekin River because



Left Cattle Creek Mill near Mackay, seen in 1974 when some growers were still supplying wholestick cane to the mill. Most however were supplying chopped cane in bulk bins. Operating both systems simultaneously caused great inconvenience and extra cost to the mills.

Table No. 1

THE AUSTRALIAN SUGAR INDUSTRY AT A GLANCE, 1952 TO THE PRESENT DAY

Locomotives	**1952**	**1959**	**1961**	**1966**	**1970**	**1974**	**1978**
Steam	170	137	98	63	na	(est. 20)	12
Diesel	7	94	119	190	na	na	240
Total	177	231	217	253	apr. 200	apr. 200	252
Railtrucks							
Wholestick	30810	43306	na (most)	46055	na (50%)	na (few)	na
Bulk-bins	0	0	na (few)	17333	na (50%)	na (most)	na
Total	30810	43306	44810	63388	62500	50000	na
Miles of Track	1354	1593	1719	1844	apr. 2000	apr. 2000	1909
Mechanical Harvesting							
% of crop cut by:							
Chopper-type	na	na	2.6%	32.4%	73.1%	97.5%	apr. 100%
Wholestick-type	na	na	2.7%	16.1%	13.1%	1.0%	near nil
Total, mechanical	na (low)	na (low)	5.3%	48.5%	86.2%	98.5%	apr. 100%
Cane Cut For Crushing							
Australia, million tons	7.0m	8.9m	9.4m	16.7m	17.6m	20.4m	23.5m

Notes: apr. = approximate estimate, na = not available.
details in brackets are author's estimates or comments

Sources:- Loco, trucks and mileages as follows; 1952, 1959 from evidence of KL Coates, CSR, to Sugar Committee of Inquiry, and covers only those owned by mills; 1961, 1966 from ASPA Annual Report, 1967, 1970, 1974 from ASYB (various issues); 1978 from Browning and Mewes, *'Australian Sugar Industry Locomotives 1978'*, (See p. 14).
Mechanical harvesting and production data from ASYB (various issues) and various published statistics.

Inkerman Mill was running behind schedule with its crushing programme while Kalamia Mill across the river, had extra capacity available to assist. The proposal did not eventuate, but it shows the potential for rationalisation when through running facilities exist. This is possible between some mills, but in general, systems are independent.

Table No. 1, above, shows the dramatic increase in cane crushed in recent years. It also shows the impact of the new technologies in harvesting and transport. The number of diesel locos and bulk-bins has increased at a slower rate than cane tonnage, indicating increased efficiency and productivity.

Part of the increased efficiency of operation of the tramways comes from new equipment, particularly diesel motive power and high capacity bulk-bin wagons, while part comes from a change in the style of operations. In earlier days, tramway operations resembled a pick-up goods operation. A few wagons would be dropped here and there at farm sidings. A lot of effort was expended often for low tonnages collected and long trip times. Today the style of operations resemble mainline operations, with fewer sidings and farmers bringing cane from longer distances to the pick-up point. Computer scheduling to enable point-to-point operations of block loads and coordination of harvesting and transport enables efficiencies in running to be obtained. The object is greater efficiency, not only for the tramway looked at in isolation, but also for the sugar processing industry in total where the tramway is a vital link in the overall efficient operation of the processing system. Faulty tramway operations could result in less than optimum use of a plant valued at millions of dollars causing losses of operating profits for the millers.

Will tramways be part of the sugar industry scene in the 1980s? Certainly, I am sure they will. Some of the factors and developments which are at present underway in the industry will ensure that the systems will be able to continue to serve the mills as a reliable and economic form of transport for many years to come. This challenge is the subject of this book.

FROM THE PAST

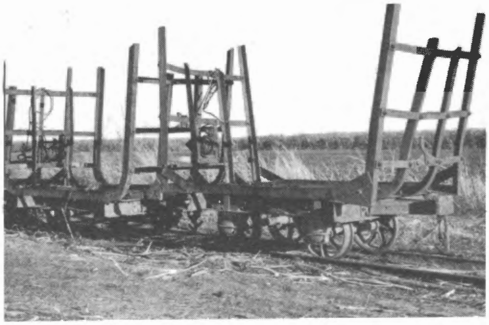
Until 1960, the sugar tramways of Australia operated much as they had since the end of the last century. While early lines often were horse powered or sometimes manpowered, the simple locomotives of Decauville, Fowler, Krauss and other companies soon made their mark in the canefields. They hauled open wagons with stake ends, sometimes holding as little as one ton of cane each. These trains were braked only by the engine brake and operations over the light tracks must have been a somewhat hazardous procedure.

Although some plantations installed well equipped systems, bringing the tracks into the fields, many independent farmers had to cart their cane to the nearest siding with a transhipment derrick, or alternatively, run temporary lines from the permanent line across road and field to the place where cutting of the cane was occuring. Of course, this line was too light for locomotives to run on, so after the cutters had loaded the wagon by hand, man or horse would push or pull it back to the siding. In later years, the tractor took over this role.

Motive power was provided by the steam locomotive. A variety of light engines, typically 0-4-0T, 0-4-2T, 0-6-0T and 0-6-2T patterns, were popular. A number of 4-6-0T locomotives from war disposals were obtained after World War I. Tender engines were not widely used, with the exception of the very successful 0-6-0 Hudswell Clarke tender design, built from 1915 to the early 1950s. CSR ordered many of these locomotives and they lasted until the last days of regular steam operations in the industry. Wood and coal were the early fuels. Mossman Mill still used wood until recent years. Experiments with oil firing, notably at Macknade Mill also occurred.

One of the delightful aspects of operations in the steam days was the local character that the locos of certain mills would acquire. Modification and rebuilding occured. Consider one of CSR's Hudswell Clarke locos built in 1925, becoming Hambledon No. 6. She was later transferred to the Macknade Mill becoming No. 4. Here she was reboilered with an illfitting spare boiler off an 0-6-2T Fowler loco and ended her days converted to oil-firing and wearing a falsepiece fitted to join the replacement boiler to the smokebox. It is events like this that make tracing the history of locos on the canefields so difficult, yet so interesting.

Locos would bring the full wagons to the mill where they or a yard shunter would push the wagons across a weighbridge to a tipper where the stalks would be tipped for crushing. A few small petrol or diesel locos were used in yards or for works trains from pre-war days and a number of larger Fowler PM locos were obtained in the 1930s. It can be seen from Table No. 1 however that it was not until recently that the diesel took over in force. With the need for higher throughput rates and reliability, the older steam locos could not do the job at the price required and faded away.



Top In the early days small cane trucks holding about one ton were used. In 1974 these examples were relegated to isolated lines to punt points on the Richmond River, serving Broadwater Mill.

Right Millaquin No. 6, a Bundaberg Fowler, seen near Kalkie with a load of wholestick cane in the late 1960s.

Right, lower Bingera Mill's *Ralf,* another Bundaberg Fowler, hauls empty wagons to farms on the Gin Gin Road, where each will be loaded with some two tons of wholestick cane. 1968.
Opposite Three Perry steam locos at the engine shed of Qunaba Mill, Bundaberg, 1974.

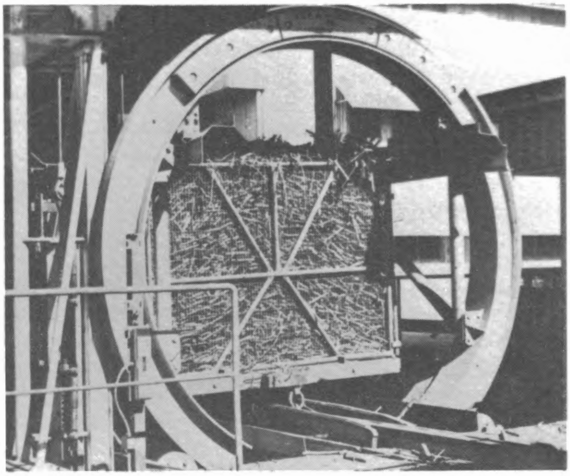
NEW DEVELOPMENTS IN CANE HANDLING

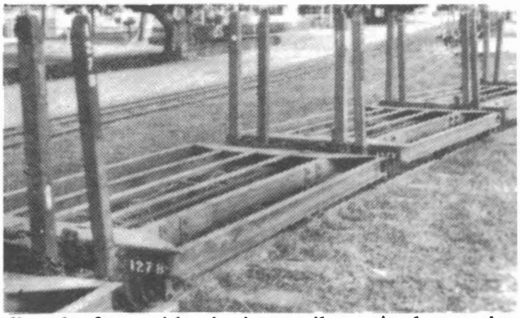
Today we see the canefields worked by fast chopper harvesters with tractors or trucks carrying bulk bins darting behind them collecting the shower of cut cane which tumbles from the machine. Thirty years ago, the same canefields would have seen gangs of sweating men cutting and trimming the cane with long knives. Loading the stalks onto the wagons was also done by the men. Labour costs and shortages turned inventive minds to mechanisation. First, loading machines were made to lift the cut cane onto wagons. Hydraulic grab types and front-end loader types were both widely used. The dirty and heavy manual task of cane cutting still was left to man.

Early in the century, experimental cutting machines were made by failed to gain acceptance. Large plantations like Fairymead persevered and developed large mechnanical cutters. These users had engineering facilities and financial strength. The small farmer often had neither, nor did he have the large areas of cane to warrant such a machine. In the 1950s, small wholestick harvesters became available and these were adopted by a modest number of farmers. The bigger chopper harvesters did not become widely used until the 1960s, and then often only by contractors or a shared machine between a group of farmers. While the wholestick harvester represented a mechanisation of a manual function in an existing system, the introduction of chopper machines required radical changes to the whole system, from farm to mill. Its acceptance was due however to the fact that it offered the best chance of development into a highly efficient mechanised bulk material-handling system. It was the step that lifted the industry from the old simple days to the new high-technology situation.

Wholestick cane could be gathered in bundles and transferred to tram wagons from carts or from simple stacks on the ground. Chopped cane however, was a less tractable substance and it was found that the easiest way to handle it was in large mesh-lined bulk bins. Initially these were built up on the frames of old wholestick wagons. They were taken into the fields on trailers and towed behind the harvester, being filled from a conveyor belt on the harvester. When filled, they would be taken to the tramway and run off the trailer onto the rails for haulage to the mill. Chopped cane proved sus-

Left Fairymead Plantation was an early innovator in the development of mechanical harvesting. Here a later model is seen harvesting cane and filling bulk bins towed into the fields on trailers. These bins subsequently are transferred onto the tramway.
Below Where bins cannot be satisfactorily towed in-field, elevating tipping trailers can take the chopped cane to the tramway siding and load the cane into waiting bins.





Above Effective rotary tippers empty rail wagons at the rate of two per minute, far superior to the old type.
Top right Canetainers of 10 ton capacity and bulk bins of 3 ton capacity supply cane to the crushers at Mossman Mill.
Lower right The ultimate development of whole-stick technology. Four ton capacity wagons built for Kalamia Mill, late 1960s.

ceptible to spoilage by bacteria. Juice from contaminated cane failed to crystalise satisfactorily in processing, to the despair of the millers. By better co-ordination of harvesting and transportation, and speedier service, this problem is minimised but cane cannot be left safely in trucks through a mill breakdown without spoilage.

In wet weather, it was found that trailers with bulk bins were bogging, stopping harvesting. Side tipping trailers were developed, running on fat tyres. These were driven to the siding and the cane tipped into the rail bins. Experiments were made with direct transport by road trucks from the field to the mill. Problems of bogging and getting good utilisation of the units can occur. Container systems of up to 20 ton capacity are in use in the NSW mill areas, but they are not taken into the field for filling directly from the harvester.

An impressive system based on the container principle, has been developed by Freighter Industries. 'Canetainers' of approximately 10 ton capacity are built so that they can be fitted to road vehicles or to bogie underframes of 2ft gauge. The canetainers can be hydraulically transferred between these modes and onto stands at sidings or at the roadside. Empty ones are delivered to a site near the farm and either transferred onto stands, or filled directly from side tipping trailers. As harvesting progresses, trailers or trucks collect empty ones, take them infield to be filled then return them to the stands, full, to await transport to the mill. Road or rail may be used and any canetainer may be delivered by one mode and collected by another. Thus mill management has great flexibility in scheduling its collections for optimum operations. Early models had side or end flaps for tipping at the mill. Later practice has been to invert the whole canetainer and empty it through the open top. Mossman Mill has adopted their use and the system has been shown overseas. The system can be used with road transport alone but tipping problems and queuing inefficiencies may arise. The solution in this case is to have a circuit of 2ft gauge track at the mill and to transfer canetainers onto bogie underframes for the short trip to the tipper. When first introduced at Mossman, a solution was found to problems of bogging the heavy containers in wet fields. The usual 3 ton bins were filled and brought to the canetainer, where it was lifted and inverted by a modified forklift truck.

The basic bulk bin has changed little since its introduction. Capacity has increased to 4 tons and Racecourse Mill has built 5.6 ton models with low-friction bearings. Stability problems and permanent way standards limit the size of bins.

MOTIVE POWER TECHNOLOGY

Until the 1950s, steam reigned supreme on the tramways of the sugarfields. Early diesel introductions had mainly been of the rail-tractor type although CSR introduced several Fowler petrol mechanical 0-6-0 types at Huxley Mill in 1930, some of which survive today at Goondi and Isis Mills. In the early '50s, CSR again led the way with a number of Baguley-Drewry 0-6-0 diesel mechanical locomotives. These proved successful and were the forerunners of large fleets of diesel locomotives now operating on the sugar tramways.

Several manufacturers soon were in hot competition for the market. A number of early locos were fitted with mechanical transmissions, indeed many still operate in the 1970s although some have been converted to hydraulic transmission. The pattern was soon set however and the typical cane loco emerged as a diesel-hydraulic 0-6-0 of 15-20 tons. Clyde and Commonwealth Engineering emerged as major early suppliers and at a later stage E.M. Baldwin also entered the market. One failure was the venture by Bundaberg Foundry to build Austrian designed Jenbach locos. Although a number were built, their mechanical transmissions were unable to perform like the hydraulic ones then coming into service, and further locos were not built. The advantages of these early diesels were soon recognised by the mills; greater economy, lower maintenance, less staff and greater availability. Victoria Mill's experience was that one of the early units could haul 1½ times the load of a steam engine of equivalent weight.

The size of the first generation of diesels was limited by several factors. The major limit was how to control a train of unbraked, loose-coupled cane wagons on light and often irregular track. When one considers the wagon construction, it is obvious that they too were not designed for high powered locos. In the early 1970s, experiments with brakevans were carried out, promising to give crews a better way of controlling the trains. Early ones were merely towed behind the loco and provided the driver with extra braking power at the head-end. The problem of getting braking power at the tail-end of the train was solved by radio-controlled brakevans. Now the driver can apply the brakes by remote control and have greater control of his train. Heavier loads can now be safely worked because of this additional development.

Wagon construction standards have also been upgraded. Steel wagon frames are now in use, where older trucks were of wooden frame construction. Standards are not uniform for all mills, causing problems when gear is transferred or sold.

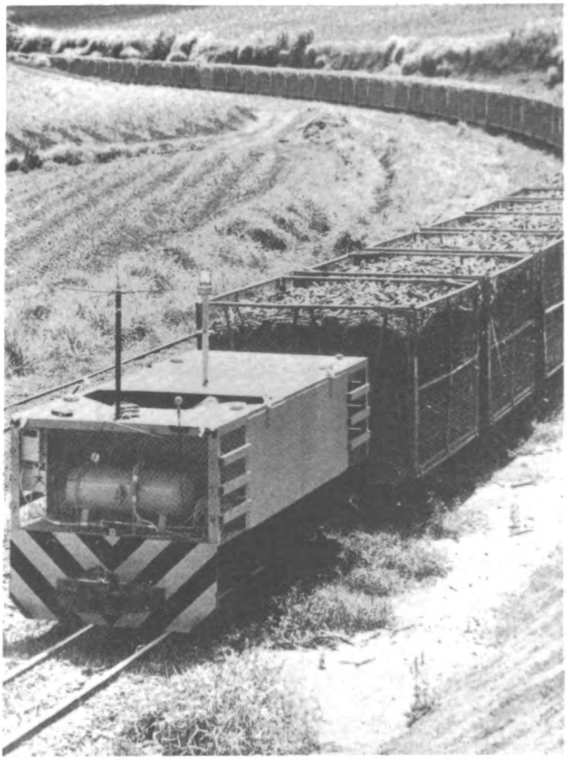
Above Although Clyde has built many of the diesel locomotives in use on the Australian (and Fijian) canefields, ComEng and E.M. Baldwin have also supplied substantial numbers. Here at Condong Mill in 1974 an E.M. Baldwin 0-4-0 diesel is washed down after duty. Shortly after, they abandoned tramway operations in favour of road haulage and the loco was transferred to a CSR mill in north Queensland.

Right The traditional steam shunter has been supplanted by hydraulic truck placing systems or rubber tyred vehicles. Here a vintage IH Farmall tractor shunts bins at Hecks Rocky Point Mill, 1974.

Stock from Condong Mill transferred to Victoria Mill in the mid-70s, had to have old ring-style couplings replaced by modern Willison auto-couplers before being able to be used at that mill. Advances have been made in axle bearings also, but not without problems as the unbraked wagons then become more free-running in shunting. Shunting impacts then become more violent, causing more wagon damage.

Double-heading is an obvious way of increasing loads. Coupling-pull limits and bridge limits make the operation of double-headers impractical. If the second loco is near the rear of the train, then it is possible, but as this requires a second crew, savings in cost are then not as great as they could be.

In the 1970s, the Sugar Research Institute worked on a 'Locotrol'-type device whereby a second loco could be worked by remote control, by the driver of the front loco. They opted for a small computer to control the 'slave' loco, rather than a hard-wired logic system. Mounted in a small wagon adjacent to the slave, it monitors the engine and transmission as well as receiving instructions by radio. Sanding, throttle, clutch and brakes are controlled. Trials in the Bundaberg district provide it practical and it is believed to be in use on the Gin Gin line. This line has some deep cuttings and it is said that some spills occurred in trials when the radio signals to the second loco were screened by



Above An early experimental model of the Clyde radio-controlled remote brakevan. Seen here undergoing trials in the early 1970s.

Photo: Clyde

Below An EMB B-B locomotive and a later model remote brakevan seen at Victoria Mill in 1977. These large and powerful locomotives dealt the death blow to the well-loved fleet of Hudswell Clark 0-6-0 tender locos at Victoria and Macknade Mills near Ingham.

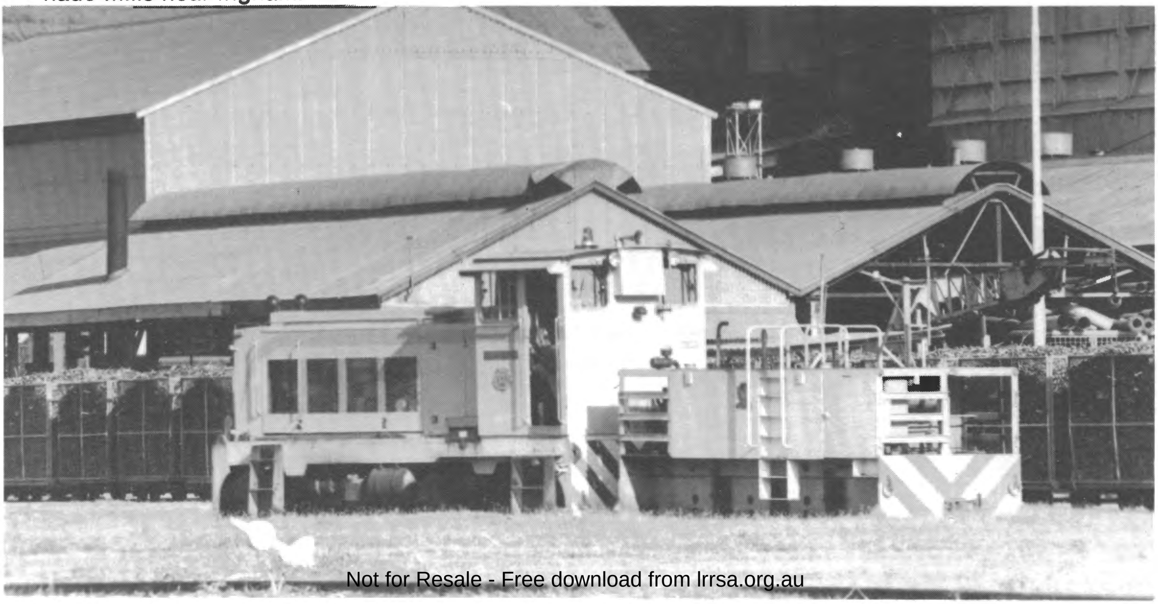


Table No. 2

SUMMARY OF MOTIVE POWER SITUATION, AUSTRALIAN SUGAR INDUSTRY, 1978

TYPE DETAILS	SUGAR MILLS			BULK TERMINALS	SUGAR INDUSTRY TOTAL	
	In Service	OOU etc	Total	In Service	In Service	Grand Total incl. OOU
Steam Locomotives						
2ft gauge	6	5	11	0	6	11
3ft 6in gauge	0	1	1	0	0	1
sub-total	6	6	12	0	6	12
Diesel Locomotives						
2ft gauge	230	0	230	2	232	232
3ft 6in gauge	6	0	6	2	8	8
sub-total	236	0	236	4	240	240
Total Locomotives	242	6	248	4	246	252
Rail Tractors						
sub-total (all are 2ft gauge)	78	11	89	0	78	89
Total Motive Power (locos and rail tractors)	320	17	337	4	324	341

Source: This table was drawn up from data drawn from the excellent publication by J. Browning and D. Mewes, *Australian Sugar Industry Locomotives 1978,* Published by Australian Narrow Gauge Railway Museum Society, PO Box 270, North Quay, Qld 4000. The author recommends this excellent publication to anyone seeking further details.

Notes: Listing excludes preserved or derelict locos.

'OOU etc' = out of use, stand-by and dismantled locos.

There are no 'OOU etc' category locos at the Bulk Terminals.

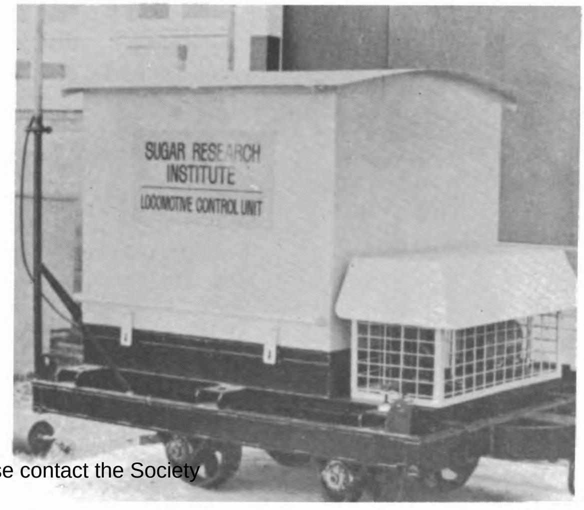
the rock walls, causing the safety over-rides to apply the brakes of the second locomotive.

While double-heading can increase loads, so can introducing bigger locos. Recent years have seen B-B diesel hydraulic bogie locos of around 25 tons, built by EMB and Comeng. Modern wagons and better track has enabled these giants to be utilised. The accompanying photographs show better than words, the new dimension of these developments.

TRAMWAY OPERATIONS

Tramway operations are now big business and all phases must be more precise and controlled than in the past. Once running could be relaxed, stopping here and there to drop empty wagons or to collect full ones at many sidings. Safe working often consisted of watching up the line for the smoke of any other loco in the vicinity. In recent years, pressures on the tramway to keep the mills supplied

Below This early model loco-trol type unit was developed by engineers at the Sugar Research Institute, Mackay. It enables remote control of helper locos, to be placed midway along a long train and controlled by the crew of the leading locomotive, by radio control. Photo: SRI



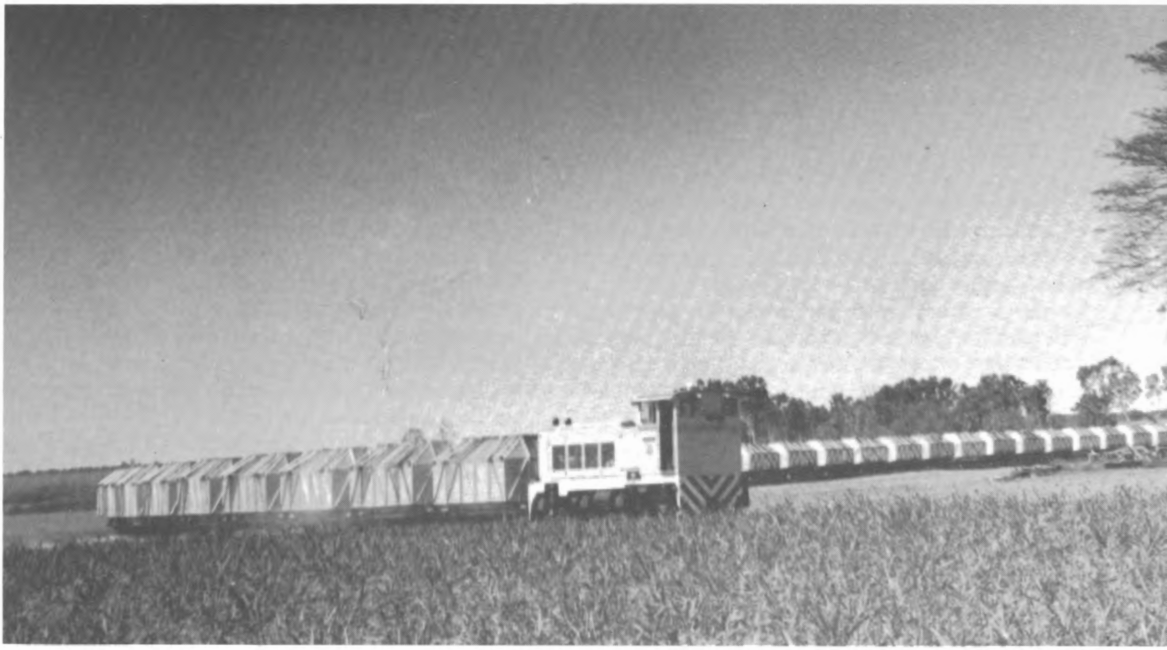
with cane to meet the increased crushing rates and to avoid the spoilage problems with chopped cane, have put an end to that style of operations from the past. Today the loco crew are not out on their own, but are linked by two-way radio to the controller. Problems are solved instantly and cane rescheduled to ensure optimum flow of cane to the mill.

The modern tramway controller has the services of the computer to assist him in planning the best course of action to take. This tecnnique known as scheduling, is discussed in later pages. In general, it results in coordinated harvesting by geographic groupings of farmers, enabling the tramway to operate fast direct services to and from a compact supply area. This type of operation is much more efficient than the pick-up type. As a result of this change in operations, track systems are also changing. Small sidings are disappearing. In some cases, small branches are closing and others being truncated to consolidate on a number of larger central collection points. The task of assembling the bins of cane is better left to motor transport with its inherent flexibility, leaving the bulk, block-loads to the tramway. It is interesting to see how this process is paralleling the changes on the state railway system's goods handling policies.

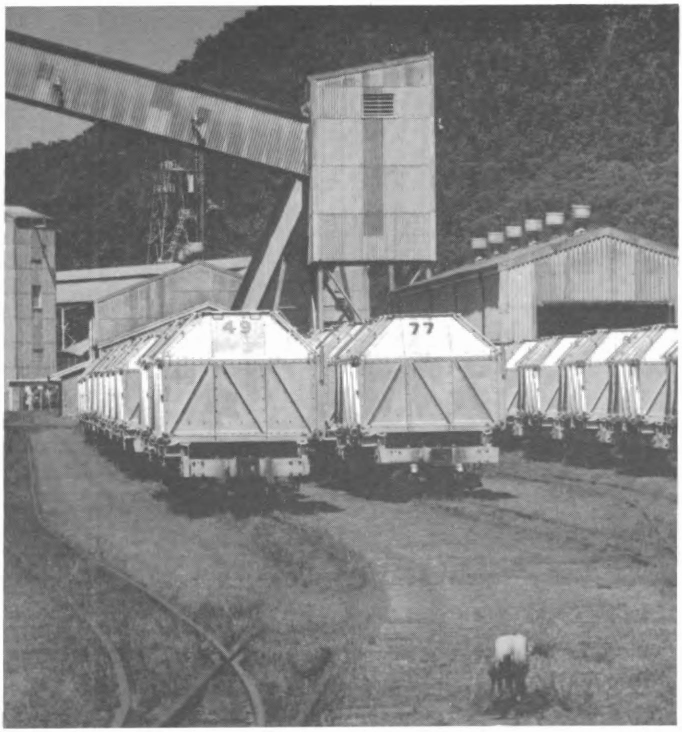
The millyard is a very important place. The orderly flow of full wagons in one end, tipping of the cane from the wagons and the dispatch of empty wagons to the farms at the other end of the yard is a great asset when compared to yards where both ends of the yard receive full wagons and dispatch empties. Redesigning of yards to achieve this flow is of benefit to efficient operations. The pattern of lines at many mills was dictated by settlement history and a line usually started from the closest side of the mill yard. Much extra shunting and counter-current movement resulted from these old layouts.

The tipper is the part of the system which sets the amount of cane being delivered to the crushers. To increase milling rates, one must tip more cane. The switch to larger wagons has enabled more cane per tip, but modern rotary tippers also enable more tips per hour to be made. The old mills often had an old loco or rail tractor pushing rakes of wagons over the weighbridge and on to the tipper. Modern wagon-placing systems today do the job with greater accuracy and timeliness. With automatic weighbridges and tippers, these systems, sometimes computer-controlled, handle the tipping of large

Below Grass grows around the wheels of a line of set-aside steam and early model diesel locomotives. Opposite, modern diesels rule the engine shed, Victoria Mill, Ingham, 1977.




CLYDE



Another role of the tramways is to carry bulk raw sugar to some of the shipping terminals. Two of the six terminals are served by 2ft gauge tramway, e.g. Lucinda, near Ingham and Mourilyan Harbour in the Innisfail district. On the upper left, an EMB diesel hauls nearly 100 empties through Halifax on the way from Lucinda back to Victoria Mill. On the upper right we see the 2ft gauge bogie wagons in the yard at Mourilyan Harbour. Both views were taken in 1977.

The contrast between old and new forms of motive power is clearly seen. On the left is a modern Clyde diesel at Pleystowe Mill, while on the right we see the scene at the depot of Millaquin Mill in 1972, where the steamers are readied for duty. While the latter are charming the former pushed them off the tracks because of their ability to operate more economically.

throughputs with greater reliability and precision than a shunting loco could ever achieve. Many mills have installed such a system in the past decade. Many too, took the opportunity to redesign their yards and approaches for maximum efficiency when they made the change. A further development occurred in 1975 when North Eton Mill installed the first double tipper. This device holds and tips two wagons simultaneously, thus increasing the flow of cane to the crushers.

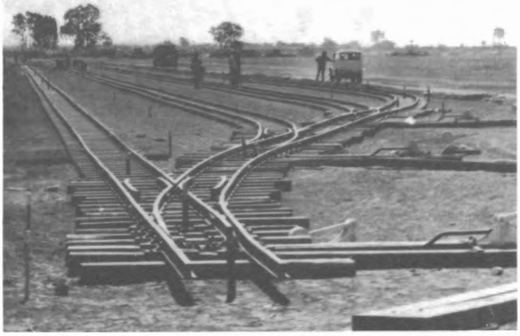
With the emphasis on speedy movement of bulk cane, attention has focused on speeding up the trains themselves. The use of radio-controlled brake vans on the rear of trains has assisted in speeding up services. Consideration has also been given to re-gearing locos for faster running. Farleigh Mill has looked at this option for improving operations on its long line north from the mill towards Calen.

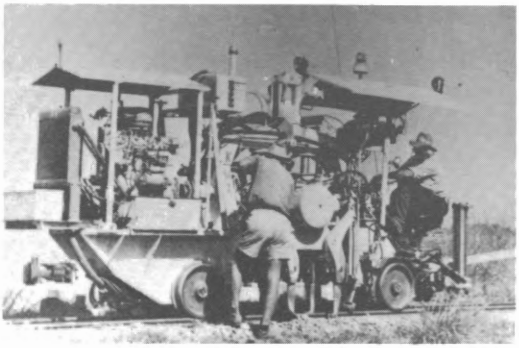
As can be imagined, the increased pressures on the tramways as they are being asked to carry more, at higher levels of punctuality and efficiency is pressuring the system towards its limits. In the early 1970s, derailments were a major problem for many systems. New wagon designs were blamed in some cases, and bearings modified. Wet weather brought home the lesson that higher speeds and axle-loads needed heavier track and better ballast. Breaking axles and wagon frames also caused problems. Farleigh Mill instigated the testing of axles and bin frames using ultra-sonic methods in 1972, following a spate of incidents where the failure of these items contributed to delay or damage. As the level of utilisation of the tramway increases, so too does the level of complexity of its operations and the seriousness of the consequences of any accident, delay or failure.

PERMANENT WAY & TRACK MAINTENANCE

The theme which has been developing through this article has been how the sugar tramways have met each new demand of them by new technology, better operational procedures or intensification of services. By doing so, the volume of cane handled and the efficiency have progressively increased over recent years. This excellent performance could not have been achieved without developments in the field of permanent way standards and track maintinance, complementing the developments in the other fields.

Modern tramway operations require heavier track and better structures than in the past. The cost of a derailment in terms of delay to the total milling system makes it imperative that this be so. Victoria Mill is often quoted as a model of an advanced 2 ft gauge tramway system, with high tonnages, dense traffic and long haul distances. The locomotives include a number of modern bogie diesel-hydraulic models of high weight and capable of high speeds. The track provided for such operations is 62 lb/yard weight. This is heavier than some branch line and siding track on Government railways. While most tramways use 30-40 lb/yard weight track, lighter track is not unknown. Many mills have been rerailing their lines with heavier rail in recent years. The market for second hand rail from QR lines is one source of replacements. Suitable rail has not always been readily available and one recalls that in the early 1940s, reclaimed rail from the closed Rockhampton street tramways was used by Mourilyan Mill.





Along with heavier track,better sleepers have been introduced. Both treated-wood and pre-stressed concrete products have been marketed and are in service at a number of mills. Getting the best from improved track materials also means that proper ballast must be provided to support the track. Some earlier attempts to operate with higher axle loads and speeds produced a large number of derailments. The high rainfall and unstable soils in some areas have made ballasting an essential part of the upgrading program at many mills. Past practice has varied, but few mills used crushed stone ballast as gravel and rubble was sufficient in those less-demanding times.

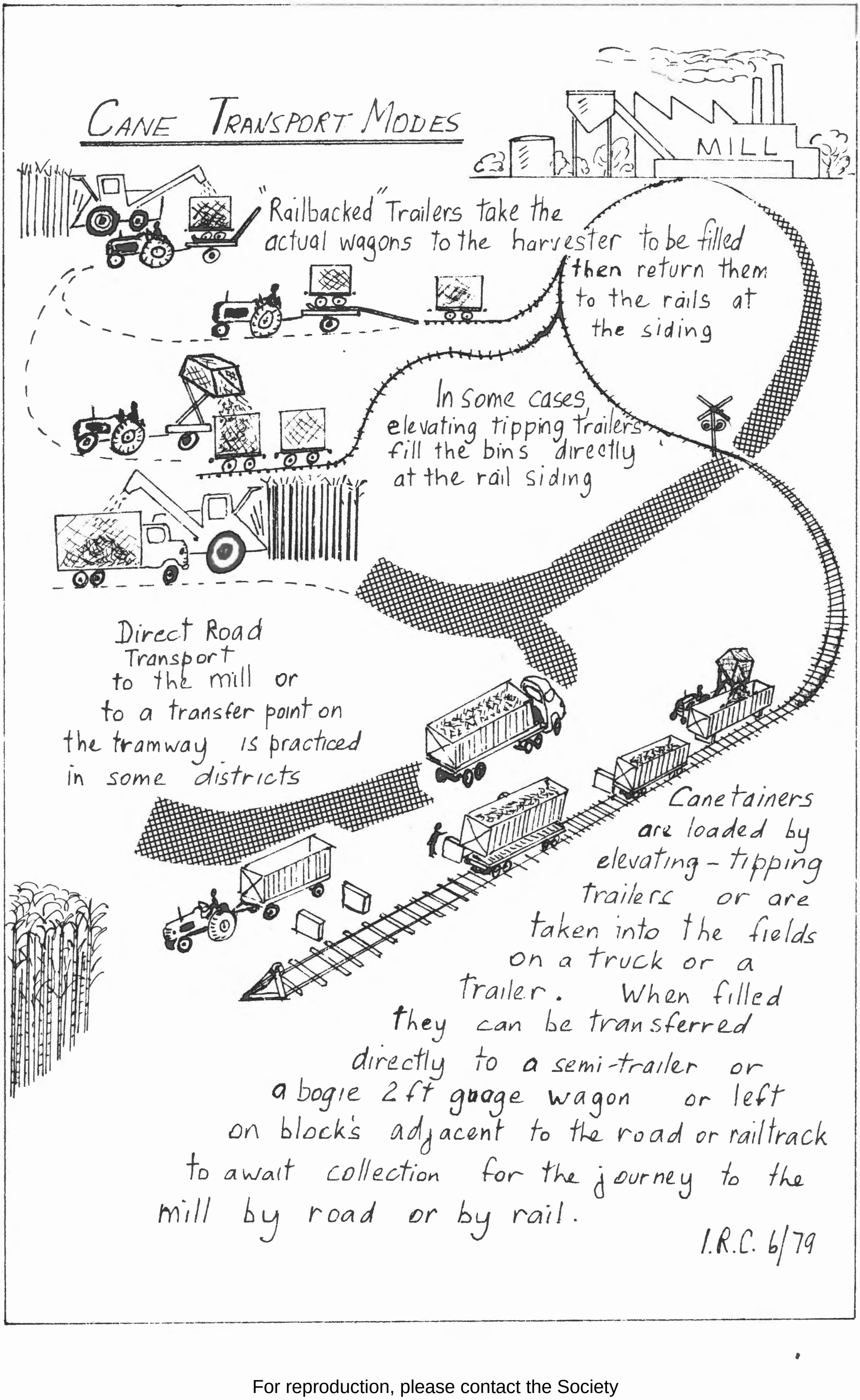
Ballast has provided a new set of problems for the track maintenance engineers. In the past, gangs of fettlers did the required maintenance manually and in later years, with the assistance of powered tools. This approach has been found to be inadequate in the face of the increased demands on the tramway systems. Like the Government systems, the mills have sought mechanical track maintenance equipment to provide economical and speedy track maintenance. While the larger systems have purchased this type of gear, the smaller mills have been able to improve the speed and productivity of their maintenance effort by smaller-scale improvements, such as introducing pneumatic hand-held track tools. A number of firms have supplied new types of equipment, not previously seen on the canefields. Ballast tampers have been put in service at many mills. Tamper (Aust) P/L and Plasser make 2ft gauge tampers. The Plasser model KMX-06, seen on the nearby illustration, can level and tamp 400 sleepers per hour, greatly improving on the results achieved by manual gangs. As with many aspects of tramway improvement, the CSR mills at Ingham were pacesetters in its development and introduction.

New hopper wagons for carrying crushed rock ballast have been introduced. These dwarf the old 4-wheel ones, often no more than old wholestick cane wagons with wooden sides added. High capacity bogie hoppers are now being used on the tramways. It can be seen from the accompanying photograph that these new wagons are a vast improvment on the ones they replace.

Opposite left New yards being constructed at Proserpine Mill, as part of a rationalisation of tramway facilities, 1977.

Opposite right The increasing demands on a modern tramway call for modern track maintenance equipment. This is Plasser's Model KMX-06 for 2ft gauge.

Below Mechanised track maintenance equipment and heavier, longer trains on sugar tramway systems call for higher engineering standards than previously employed. Ballast handling is one area where modern equipment is being introduced. Here, a train of old four-wheel stock and a modern Com-Eng bogie ballast wagon is being filled for the yard construction project at Proserpine Mill, 1977.


CANE TRANSPORT MODES
MILL
"Railbacked" Trailers take the actual wagons to the harvester to be filled then return them to the rails at the siding
In some cases, elevating tipping trailers fill the bins directly at the rail siding
Direct Road Transport to the mill or to a transfer point on the tramway is practiced in some districts
Canetainers are loaded by elevating - tipping trailers or are taken into the fields on a truck or a trailer. When filled they can be transferred directly to a semi-trailer or a bogie 2ft gauge wagon or left on block's adjacent to the road or railtrack to await collection for the journey to the mill by road or by rail.
I.R.C. 6/79

When the lines and branches were originally laid, some nearly a century ago, many imperfect features were incorporated. They were designed as light railways, and in the best light railway tradition incorporated such features as steep grades, tight curves, roadside location, light bridge standards, flood-prone locations and level crossings of roads, railways and other tramlines. While these features and the associated operating style adopted to cope with them gladden the heart of the railway enthusiast, they dismay the engineer and the economist. In the overall process of improving the tramway system, the general raising of engineering standards of track and associated structures has been necessary. Faster speeds, higher axle loads and heavier trailing loads demand it, and if it is not done, breakages and derailments will follow. Programs of bridge and culvert strengthening have been undertaken. Low-level wooden bridges have been replaced by higher, steel bridges and wooden openings replaced by concrete pipe. High capacity transport systems require high engineering standards to operate in an economical manner.

A small improvement in a limiting section of the tramway may lift the whole tramway's performance significantly. Over 20 years ago, Isis Mill built a cutoff line which saved many miles of difficult working over the course of the years. Marian Mill has a difficult section over the Messmate Range where grade improvements in recent years have meant improvements in capacity and cost savings. Such projects need not be large. The elimination of level crossings over mainline railways is one area where significant delays can be eliminated. Farleigh Mill installed an underpass under the QR North Coast Line near the mill, around 1975. This has eased delays where previously cane trains had only been able to enter the yard from that particular line when cleared to cross the QR track. Prosperine Mill is also undertaking a similar replacement project at the present time. The elimination of level crossings over roads can also make operating conditions more satisfactory. Some older branches are located such that crossings are not readily visible to oncoming cars. Speed restrictions and collision risk make road crossing removal worthwhile in some cases. Prosperine Mill realigned some of its track in the tourist area near Shute Harbour to eliminate a number of level crossings. In this busy area, many drivers were tourists, not used to looking for tram crossings!

Great improvements to the tramway systems are possible where the engineering standards permit new loco and roling stock technology to be employed.

Right The 1960s saw the introduction of revolutionary new technologies to the sugar industry. This illustration shows the new chopper-type harvester which delivers the cane int he form of short chipped billets, mechanically loaded into bulk railbins which are brought into the fields on the backs of trucks or trailers. Machines have replaced men in most of the dirty, hard tasks of cutting and loading the cane.

INTEGRATION WITH ROAD TRANSPORT

While road transport is flexible, the tramway has the ability to haul more cheaply large loads on fixed routes. It also can store cane awaiting crushing more economically than is the case when road trucks are kept in a queue. Overall the ideal system takes advantage of the features of each and uses road trucks to assemble the cane from the farm to the tramway which hauls it to the mill and holds it for crushing.

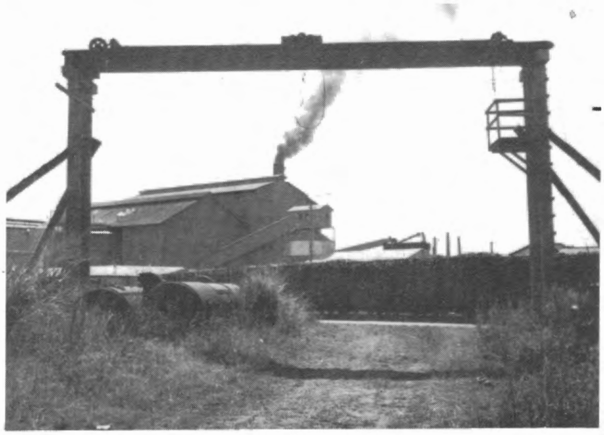
When mills abandoned cane haulage by State Railways, they adopted road transport of cane from farms to the mill or to the nearest tramline. In some cases, this was inefficient use of of trucks so tramway extensions were made to take advantage of their economy in long haul operations. Where distances were short or traffic light, a tramway was not warranted. A number of road operations have developed to cater for this situation.

The simplest has been 'rail-back' operations, so called because rails are laid on the back of a semi-trailer and rail wagons transported in a 'piggy-back' fashion between the tramway siding and the farm. The canetainer system where 10 ton containers are road transported to tramway interchange points is discussed earlier in this volume. The NSW mills, then under common CSR ownership, adopted a road-only system to suit their particular problem of small volumes of cane from widely dispersed sites. They used the Multilift system which involves the use of 20 ton containers. These are left by the roadside and the farmer fills them from a tipping trailer which operates in conjunction with the harvester. A semi-trailer then comes and takes the container to the mill, where it is demounted and tipped when convenient.

Some mills have attempted to use road transport exclusively. This causes problems, particularly as expensive vehicles must not be left waiting to tip their loads at the mill, if operations are to be economical. Heck's Rocky Point Mill accepts all cane by railback truck. The tramway consists only of a mill yard. No tramway haulage, as such, is used. Maryborough Mill has installed a circuit of 3ft 6in gauge track with bulk bins on ex-QGR bogies. Road trucks deliver all cane to the mill yard where they tip into these bins. The tipping into the crushers is done at an even rate from this short rail system and the delay to road trucks is minimised. They had had great problems before installing the system with non-standard truck bins, often home-made by the farmers, adding to their difficulties. At Gin Gin Mill before its closure, nearby growers used road trucks to deliver direct to the mill. When it closed recently, transfer points were set up in the old millyard to load this cane into rail bins for the long haul to Bingera Mill.

In all these examples, we can see how the best features of road and rail can be combined to make an integrated system to transport and hold the cane for crushing, with reliability and economy.

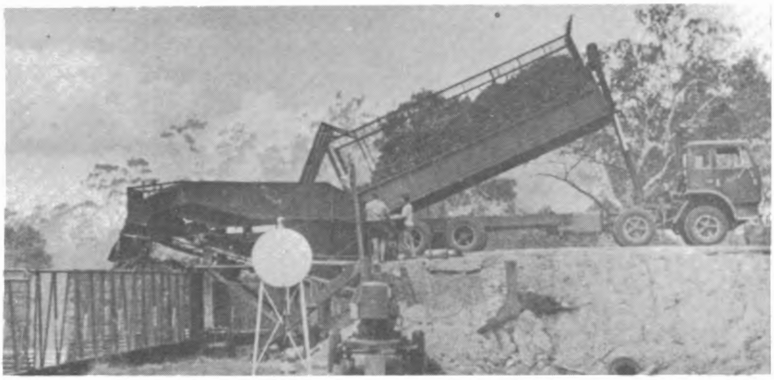
Below This is how cane was brought to Marian Mill in the early 1970s from farms along the North Coast Line (QGR) after mainline haulage of cane ceased there. Bundles of cane were taken by truck to the nearest tramway siding for transfer to 2ft gauge wagons for its trip to the mill.



Above In some cases road vehicles are taken into the canefields and loaded direct for road transport to the mill or transfer points where their load of cane is tipped into tramway wagons.

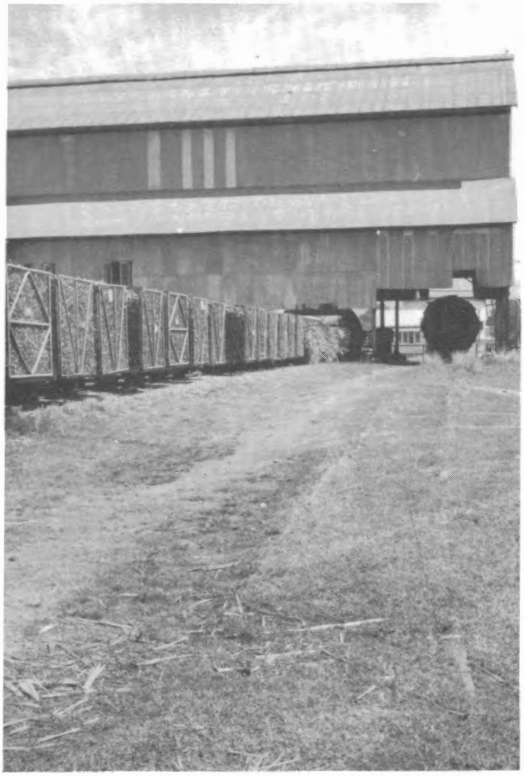
Above A typical rail-backed truck operation where tramway bins are winched onto the back of a truck or trailer which has been fitted with rails. The wagons are then taken to be loaded with cane. Heck's Rocky Point Mill, 1974.

Right At this transfer point road trucks tip their load of cane into tram bins. This particular point is in the Wallaville area where closure of the Gin Gin Mill means that cane is hauled a long distance to the Bingera Mill.



Right At Maryborough Mill cane which once came by QGR now is delivered by road. In the mill yard a circuit of 3ft 6in gauge rail track has been laid. Cane is transferred from road vehicles to bins on this track. These wagons then are shunted to the tipper, no more than 200 metres away.

Opposite At Heck's Rocky Point Mill, this gantry was used to unload bundles of cane from road trucks before the present system of rail-back operations with bulk railbins was introduced.



Above The tracks to the old 3ft 6in gauge tipper are overgrown with disuse since haulage of cane by QGR to the Cattle Creek Mill ceased in the late 1960s. Photographed in 1974.

OTHER MODES OF TRANSPORT

While light railways and road vehicles have transported most of the cane to the mills, other transport modes have also been employed. Some mills are sited adjacent to mainline railways or their branches, while others were sited on navigable waterways.

In the 1950s, up to one million tons per year of cane was delivered by the Government Railways in both Queensland and NSW. Today the sole mill receiving cane by this method is in northern Queensland at Sarina. The Plane Creek Mill receives cane from the isolated Carmila canefield, some distance south of Sarina on the North Coast Line of QR. Until the early 1960s, another isolated area at Koumala, north of Carmila, also sent its cane to Plane Creek Mill by QR. Rising costs in the 1950s saw the mill embark on a major tramway extension to link this area with the mill by 2 ft gauge light railway. Incidently, it ran parallel to the QR line for most of is course. Carmila however was too far to warrant further extension. When mechanisation of harvesting changed the pre-paration of the cane from bundled wholestick to chopped cane, experiments were done and a system of 4 ton bulk bins was developed. These are carried infield by motor vehicles, then taken to the railway. Here they

Below The only mill still receiving cane supplied by a Government railway is Plane Creek Mill at Sarina. Here 3ft 6in gauge wagons are seen awaiting tipping at the mill in 1977.

are hydraulically transferred to QR wagons; two bins per 4-wheel wagon. North of Mackay, large areas of the canefields were developed on the basis of railway transport. From the late 1960s, the cost of this type of transport forced its cessation. Mill lines were extended and coordinated road transport was developed to serve these transfer points. In the past, most lines in coastal Queensland carried cane at some time in their history.

In New South Wales, one of the reasons for building the isolated line (now part of the main system) from Murwillumbah to Lismore, last century, was to aid the fledgling sugar industry on the north coast. It had the effect of closing a number of small mills and establishing a transport pattern for sugar cane which lasted in reduced form into the early 1970s. In later years, cane from the isolated canefields at Crabbes Creek was hauled to the NSW siding of the same name and there was transhipped to 4 ft 8½ in gauge wagons for the haul to Condong Mill at Murwillumbah. The little 2 ft gauge lines were operated by modest rail tractors which pulled small loads of wholestick cane, two tons per wagon, to the modern electric transfer gantry where four wagon loads would fill one standard gauge flat-top cane wagon. When the march of time brought mechanised harvesting of chopped cane to the area, the decision was taken to cease both tramway and railway haulage of cane to Condong Mill and large trucks now haul 20 ton containers of cane on the roads of the district. It would seem that the Carmila experience is an isolated case with special circumstances. One can but speculate about its long term operation.

Railway operations to and from many mills for the haulage of bulk raw sugar still can be seen today. Here also, road transport is taking much of the traffic, particularly for the shorter hauls where the mill is close to the port. We can however expect to see the sight of long strings of bulk sugar bin wagons, headed by a blue and white diesel-electric locomotive on the QR mainlines for some years to come. The few 2 ft gauge services where bulk sugar is hauled to the ports of Lucinda and Mourilyan however are short-hauls and under severe pressure from the relatively favourable economics of road haulage.

Some mills were sited on navigable waterways. Cane was brought to them by punts and from some, raw sugar was lightered away. The three NSW mills actually were able to load directly into coastal vessels from the mills themselves. Other mills built tramway links to navigable water. Fairymead, Mossman and Mourilyan Mills all had wharf branches. Mourilyan Harbour ultimately developed into the district port. Today it is a bulk sugar port, still served by 2ft gauge tramways. At Mossman, the early river wharf was superseded by a port and linking tramway, operated by the local Shire, which served until motor transport took over. Cane punts were a feature of the NSW mills until the early 1970s. With the introduction of chopper harvesters, the punts were discarded, along with the delightful tramlines which served the river loading wharves. Few boasted a loco. An old tractor or even a horse provided the motive power. Line and equipment were often old castoffs from the parent mill system. While quaint, these isolated light lines and the old tugs and punts could not compete with the semi-trailer and the multi-lift container on economic grounds in the 1970s.

Right Some mills were located on rivers and used punts to move sugar cane from farms to the mill for crushing. The mills in northern New South Wales were large users of water transport both for cane and raw sugar. Here in the early 1970s cane is delivered to Harwood Mill near Grafton, NSW, shortly before road transport took over the task of carting all sugar cane to the mill. This is the most southerly of the Australian mills.

THE COMPUTER AGE

While recent developments have taken sugar tramway technology and operations to a highly developed state, milling and administration have not been far behind. In all of these phases in the process of getting the stick of cane on the farm to the sugar crystal on your table, one common feature of recent years has been the use of computers to increase the efficiency of the process. Tramways have been no exception to this and have used them in exciting ways. The future however holds more in store. The old style steam driver or tramway manager will not recognise some features of operations in the future.

Computers were introduced at a number of mills from the late 1960s. Early uses tended to be for accounting and record keeping, but it was soon seen that the computer could make an important contribution to the control of the milling and transport processes. Fairymead Mill used its IBM System 7 wagon recording at the weighbridge and tipper. Mossman and Mourilyan Mills also were early users of computers. The data entered is used for preparing accounts and statistics on the cane, and with other information entered into the computer, e.g. juice strength, trash rates etc., can be linked to further stages of milling ensuring better technical control over the process because of the additional information.

Other uses of the computer touch more directly on the operation of the tramway. Daily scheduling of the tasks of the transport system can be done with an appropriate computer program. The day's operations must be done in such a way that sufficient empty wagons are available for harvesters, sufficient full wagons are available at the mill at all times for the crushing schedule to be met and the minimum amount of deterioration of the cane is permitted. The latter is important as the farmer gets paid on the sugar content of his cane when crushed. All this must be done in the knowledge of loco maintenance needs, staff shifts permitted and feasible loco runs. The question of minimum-cost transport and greatest efficiency is at the core of this technique. Tully Mill adopted this technique in 1968 to minimise the cane spoilage problem. Strict control of harvesting time and coordinated transport have significantly improved the position.

The use of day-to-day planning techniques like loco scheduling can be regarded as tactical planning. There also exists scope to use computers for what can be regarded as strategic planning. The Sugar Research Institute is one body which uses the technique of transport system modelling to investigate long term planning problems of mill transport systems. The sort of question which is looked at here may be; 'Should my mill introduce more powerful locos?', 'Should we reduce the maximum grade on our lines?', 'Should we abandon any branches and replace with road haul?' or 'What is the optimum number of locos and bins for our mill's needs?' This is done by running a mathematical model describing the structure and operations of the system, for a large number of situations and assessing the results. The interpretation of the results is a skilled and complex task. Such things as balancing the interests of the miller and the farmers, or choosing between options where one has lower costs but higher risk of failure against another with higher costs but lower risk of failure, call for the wisdom of Solomon! While such a procedure has its drawbacks, these computer simulation techniques are useful tools for comparing alternatives open to a mill to overcome a problem related to its transport system.

New applications for the computer are being developed. New instruments and techniques enable better monitoring and control of the sugar making processes. For the tramway, two possibilities stand out. The first is automatic truck recognition. Here the serial number of the truck is read as it passes to the tipper, by a sensor. Electric-eye types are used in other industries and the SRI has experimented with eddy current effect sensors. These read a coded number set in a sequence of metal tags on the underside of the wagon. For containers, they are set into the top. This eliminates the chance of error when a human operator enters the numbers manually. The second is the development of 'train describer' systems which enable the computer to monitor the status and location of all trains on the system at all times. Mill management will receive automatic prediction of arrivals shortfalls and bottlenecks. It can also be programmed to perform safeworking functions and even extended to automatic remote point setting and colour-light signalling. While these are not yet features of existing operations, the day must surely come when the inexpensive mini-computers now on the market, make this an attractive possibility on the busier tramways.

The computer will bring a revolution to the canefields, both in the mill and on the tracks, as surely as did the diesel loco and the chopper harvester in the 1960s.

THE CHALLENGE OF THE 1980s

Will the sugar tramways see out the 1980s in their present form as we know them? Will they adapt to a changing world or will they sink from sight like so many other features of the world we once knew? Will they join the cane-cutter, the steam loco, the river punt and the cane trains which once ran on Government Railways, in extinction?

My personal view is that they will prosper; perhaps not in the same form as we see them today, but the tramway systems of the Australian cane-fields offer a unique and economically viable form of bulk transport to an industry which depends on timely delivery of vast quantities of its raw material to its mills. In the field of bulk transport, the light railway can hold its own. In the field of assembling the chopped cane for forwarding to the mill, the flexibility of road transport is likely to prevail. Tramway operations will revolve around block movements of bins from a small number of assembly points on the tramway. Movement of bins or container-type equipment to these assembly points will be by road vehicle. One point to ponder is the possible effects of a worsening of the energy problems of the world. In such a case, the advantage may swing back to a system with more pickup points as the cost of the motor vehicle assembly operation increases, or if motor fuel is rationed.

Tramway operations in the 1980s will be users of the latest in high technology. The joint pressures of getting the transport of cane done at the least cost, and of having a system of the highest reliability will see to that. The possibility of computerised systems of the train describer type, with safe working checks, remote point setting and colour-light signalling, is not beyond realisation in the next decade.

One must surely wonder as to the nature of technological changes for locos and rolling stock. Will we be shortly seeing 36 tonne C-C diesel locos on the sugar tramways, as John Browning and David Mewes suggest in their book, *Australian Sugar Industry Locomotives, 1978?* Will the four-wheel bin remain the major form? Will it be replaced by a bogie bin or container system, and will they be fitted with continuous braking, or perhaps with independent remote braking on individual wagons?

We cannot be certain as to the future. One thing however is certain, and that is that many people of great ability and knowledge are working in the sugar industry, in the engineering industry and at various research institutions to fit the tramways with the kit needed to meet the challenge of the 1980s, and to win!

PRESERVATION

Many people would say that some of the magic has gone from the canefields now that the panting of steam engine exhausts and the rattle of the old style trucks is heard so seldom. The growl of the diesel may mean more effective transport for the sugar cane but it marks the passing of an age where the tramway had great character and individuality. Today the tramway is an efficient and highly controlled transport system, an arm of the process of milling. While some mills retain steam locomotives, most have gone and the mills lost much of the uniqueness of the old-style sugar cane tramways. The only mill where full steam operations may be regularly observed, at time of writing, is Qunaba Mill near Bundaberg. Steam yard locos may be seen also at Marian Mill near Mackay. How long these remain in service is conjectural.

While the world of business cannot retain the old system for sentiment's sake, there are others with a deep and enduring love for the steam loco, who will ensure that it lives on. Preservation groups have acquired many old locomotives from the canefields and have restored them to running condition to keep

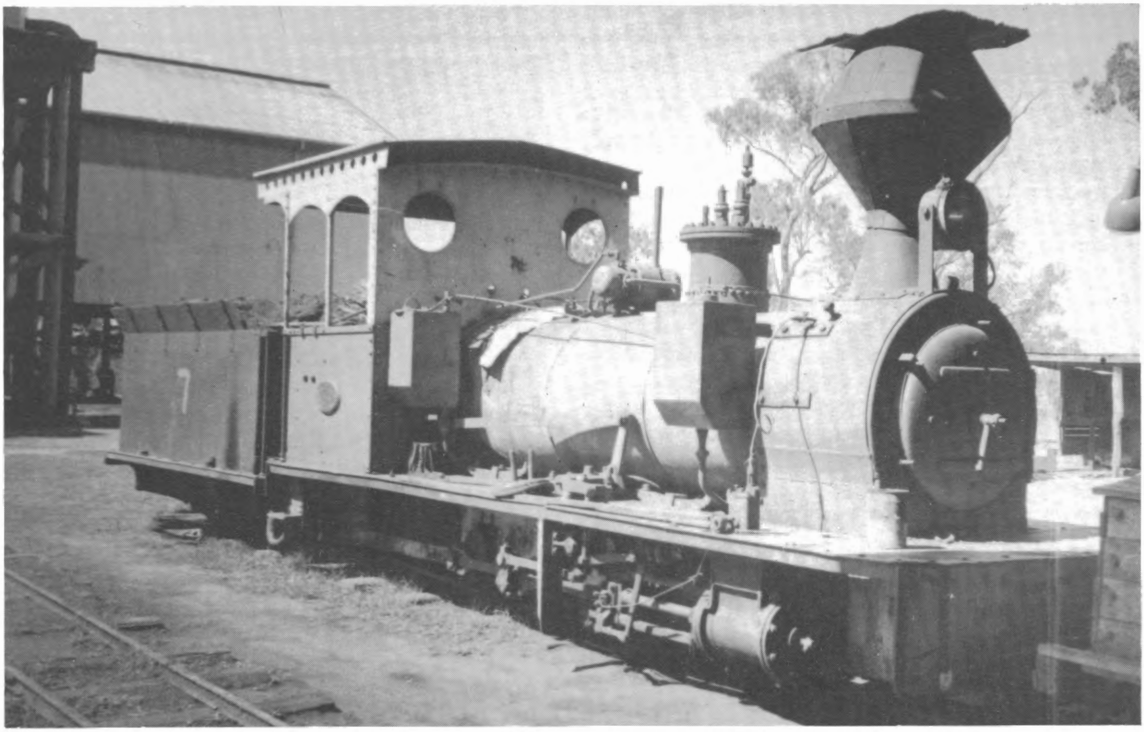
Above This Fowler locomotive, ex-No.8 of Pleystowe Mill, is a sorry sight at Bucasia Beach near Mackay in 1977. The loco (B/No. 20764 of 1937), is corroding and is missing various parts. It and several other 'preserved' locos have recently been taken away for scrap as local authorities find the task of properly caring for the deteriorating relics to be beyond their resources. Unless properly cared for, they quickly become a danger to the safety of the children who love to play on them.

alive that magic for our children and for our children's children.

When the early locomotives reached the end of their working lives, most were scrapped or run off the end of the tracks into the junkheap. Little interest or merit was seen in preserving these at the time. Some went into parks or schoolgrounds where they rusted away, without proper treatment. As it became evident that diesels would displace the steam loco, most towns sought to place an old steamer on display in their park. Often a service club would paint it bold colours and decorate it with children's story characters. Some locos were properlu treated to prevent rust and painted in true colours as an example of historic preservation. Often a mill would mount such a loco on a plinth on its lawns.

In the years that followed, interest rose in operational preservation. Two groups arose. The first was the preservationist who wanted to operate an accurate representation of the loco in its heyday, while the second sought the old locos as a commercial venture, a sort of 2 ft gauge funfair attraction, often in conjunction with some other tourist venture. The latter thought nothing of extensively rebuilding or decorating any loco or stock to suit their purpose, while the former sought to accurately reconstruct and preserve. The preservation groups soon found that the job required vast sums of money to do properly. Their yards often held items awaiting funds for badly needed work. Often places to work on locos were difficult to find and space for a suitable track to operate a museum was even more difficult to acquire. Promised items languished at mills awaiting collection or sat in members' backyards. Several museum groups are today setting up museum lines and most have been through years of difficulties in assembling their collections, finding sites and funding development of their ventures.

It is interesting to see the ground between these two extremes narrowing. The preservationist is moving towards partial commercialisation as he finds that money is needed to pay rates and fuel bills. Even where voluntary labour is used, large sums of money are still needed to operate a museum line. As a generalisation, money cannot be made from railfans alone. Tourists are the source of funds which must be taped. Such an operation must compromise the original intent to some degree but at least it enables the museum to continue. The alternative is to find a rich benefactor or a large Government grant.



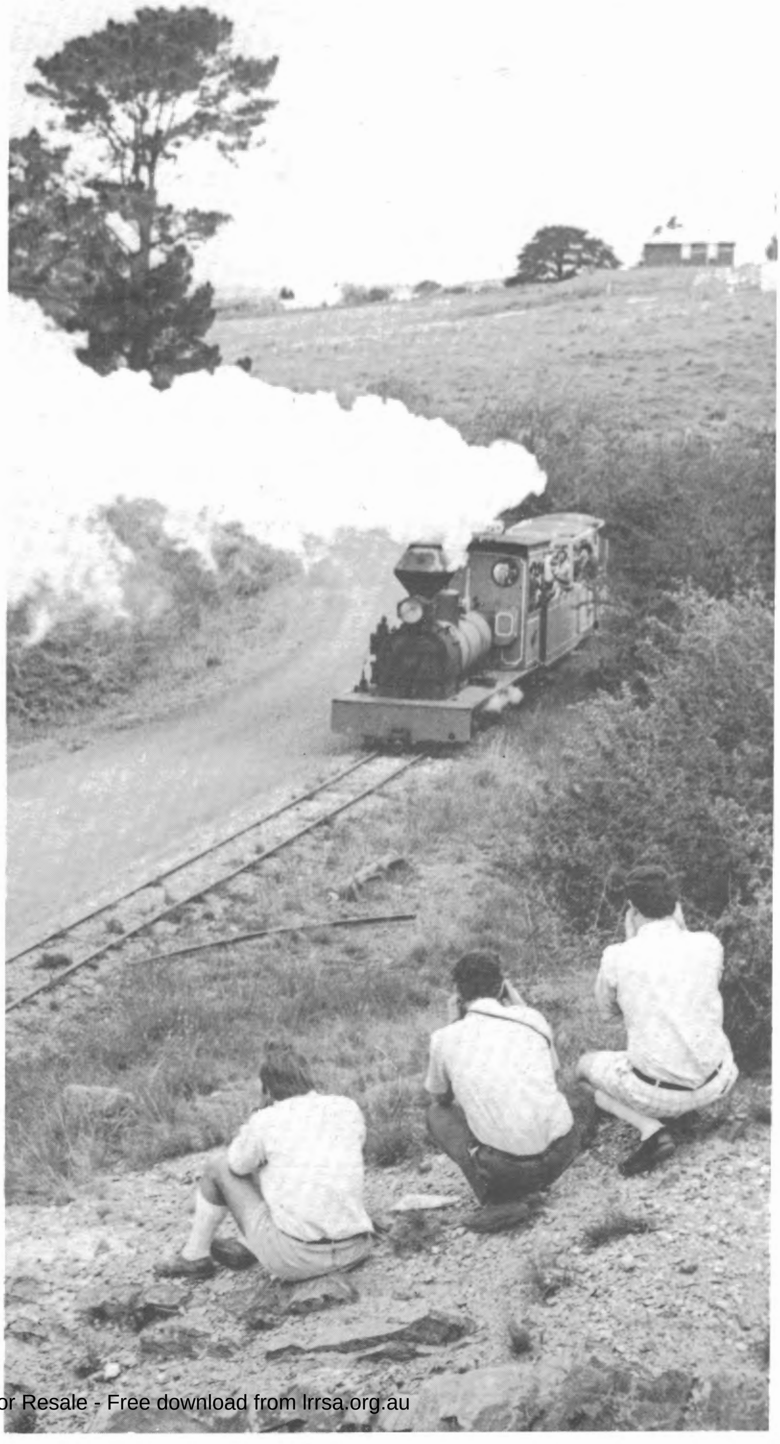
While the preservationist is forced to become more commercial, the development of historic-theme tourist parks is making the operators of some of the commercially preserved locos, more conscious of historic accuracy and detail. A good example is 'Timbertown-Wauchope' which uses a

No. 7 STEAMS ON

Preservation today means more than just placing an old locomotive in a park to decay. The restoration of these fine machines is undertaken by operating museums and tourist railways. While the latter are not always true to historical fact, they do in fact preserve and operate loco types which otherwise may have been scrapped.

Right Here enthusiasts snap restored Hudswell-Clarke 0-6-0 B/No.1098 of 1915, ex Gin Gin Mill No. 7, at Marsden Weir Museum, Goulburn NSW. The date is early 1973 when Bruce Macdonald was still running it. Since that time he has left the museum and taken several locos, which he owned personally, with him. No. 7 was one of these and we can look forward to seeing it again in the futre at another location.

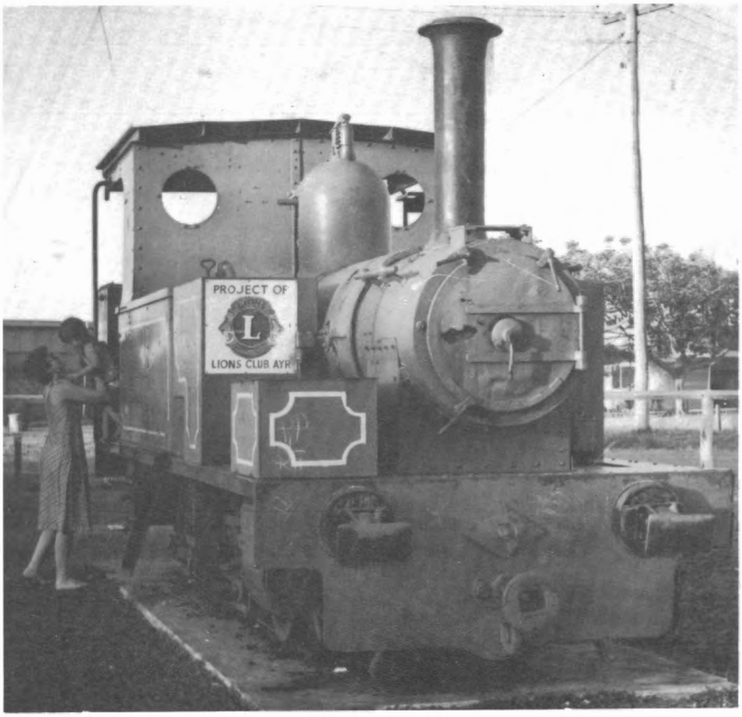
Left In 1968 No. 7 was still at Gin Gin Mill but being used less and less as the system was being dieselised. Here it sits in the sun behind the loco shed, partially dismantled and with its stack covered to keep the weather out. Her original owner was CSR, but passed to Isis Mill when the CSR Huxley Mill was closed in 1933. In 1969 she went to her fourth owner, Mr B. Macdonald at Marsden Weir.



number of well restored ex-canefields locos for a tourist railway operation. Combined with this is an accurate museum of preserved relics of the timber industry. Log bogies for the tramway demonstrations are true to design as will be the operating techniques when the museum is fully operational. The uneasy marriage of tourism and history cohabits remarkably successfully in this case. The patrons seem to enjoy it without Mickey Mouse gimmicks, without the driver wearing a cowboy hat and without the need to have the Indians hold up the train and rob the customers of the play money thoughtfully provided by the management as the patrons board for their trip-of-a-lifetime. The lesson to be learnt here is that historically oriented preservation can be a commercial success if sufficient funds are available to set it up properly and if marketed correctly. Marketing involves siting the venture in a place where potential customers exist, usually a tourist area or a weekend driving route near a big city, and advertising and promoting it to make visitors want to come. While technical aspects of preservation are important, the commercial aspects of each venture must be given at least equal prominence and attention.

Many of the old locomotives which were placed in parks in the past can no longer be seen today. Despite good intentions, local authorities failed to ensure that many of these locos were suitably prepared to face the weather. Rust, corrosion and vandalism soon turned them into sad relics. Children love to climb and play on them, but once a leg has been cut by loose boiler cladding or a foot put through a rusted tender floor, pressure is put on the authorities to remove or fix the 'health hazard'. In general, the course of action has been to remove it and sell it for scrap. Not all councils have acted irresponsibly in preservation matters. Some locos are treated with proper preservatives and placed under shelters. In other cases, continuing maintainance (official or voluntary) has saved park-preserved locos.

A new feature is the willingness of local people to let preservation societies take these degenerating locos from their parks for proper restoration. They realise that they will be lost forever if the process is allowed to continue. Where ten years ago, locals would fight removal of a local loco from the district, today they are permitting groups (even from southern states) to take these locos while there is till time to save them. While many interesting specimens have been lost forever, a remarkably large number have been saved so that future generations will be able to experience some of sugar tramways' past history, so different from the modernised tramways now meeting the challenge of the 1980s.

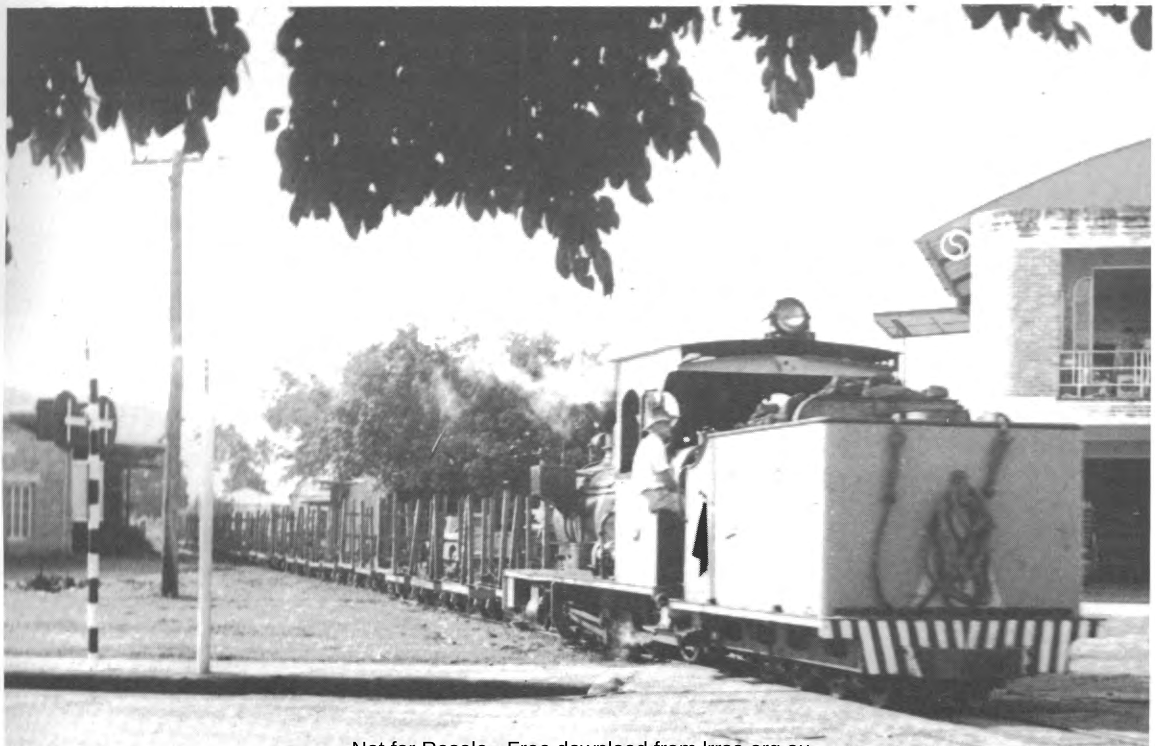


Left At Brandon, near Ayr, *Airedale,* a 3ft 6in gauge Avonside locomotive can be seen preserved in the park. Despite care and attention, the elements here are too taking their toll and the locomotive is deteriorating. *Airedale* is unusual as it is a representative of the sole mill system to use 3ft 6in gauge for its plantation haulage, at least in modern times. Some other mills operated 3ft 6in portions of their systems but in conjunction with hauls partly on the QGR, while generally retaining 2ft gauge light railways or tramways for plantation haulage purposes.

Above Millaquin No. 8, the lone 0-4-2T Bundaberg Fowler, all others being 0-6-2T, being coaled up one morning in 1968.

Above Only thirty years ago, one could find horses in regular use shunting cane wagons. Harvesting gangs would lay light temporary track across the fields to the worksite. Loaded trucks would often be hauled long distances by horse or tractor to the permanent tramway tracks.

Below A Victoria Mill Hudswell-Clarke 0-6-0 tender loco hustles its rattling rake of empty wholestick wagons across National Route 1 at Ingham in 1968, a decade before the big diesels took over.



One of the last surviving steam locomotives in the Australian canefields today; Marian Mill's 0-6-2T Perry (B/No.2601.51.1 of 1951) seen here shunting the yard on the southern side of the mill. 1977.

Printed by Newey & Beath Printers Pty. Ltd., 10 Belford Street, Broadmeadow 2292
Registered for posting as a periodical Category B