

The Times

September 2017

A journal of transport timetable history and analysis



**Travelling with Ted
Puff's many Tickets
Self-correcting timetables
The Film Lion and its timetables
Inside the NZR Traffic Manager's Office**

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Incl. GST

The Times

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The film "Lion" and timetables *Letter from* TONY MCILLWAIN

While some motion pictures have touched on train timetables, the excellent new Australian/UK film 'Lion' goes further, delving into train running times as a part of the solution to the quest of the lead character to find his mother. Briefly, five year old Saroo finds himself on an empty carriage working across eastern India, ends up in Kolkata, and is later adopted by a Tasmanian couple. As an



adult, he tries to trace the location of his village, using Google Earth. The search parameters are set by the time he was on the train (two nights and a day) and by the average speed of Indian non-express passenger trains of the period. Saroo covers a wall with charts showing average speeds and radial distances from Kolkata overlaid on maps. This narrows the search to parts of central India, and through Google Earth he eventually identifies familiar landscapes and locations, around the city of Khandwa.

The end credits acknowledge the assistance of the Indian railfan group, IRFCA, the Indian Rail Fans Club Association. Club Association doesn't really gel, and I think it was originally Indian Rail Fans Club of America, set up as an online group by expatriate tech savvy Indian rail fans in the USA. Stuart Kean may be able to confirm this. Of course, India itself is now internet savvy, and the group has many Indian residents as members. It was probably the first internet-only railway enthusiast organisation, and remains this way, save for an annual conference.

'Lion' I should add has some excellent railway photography.

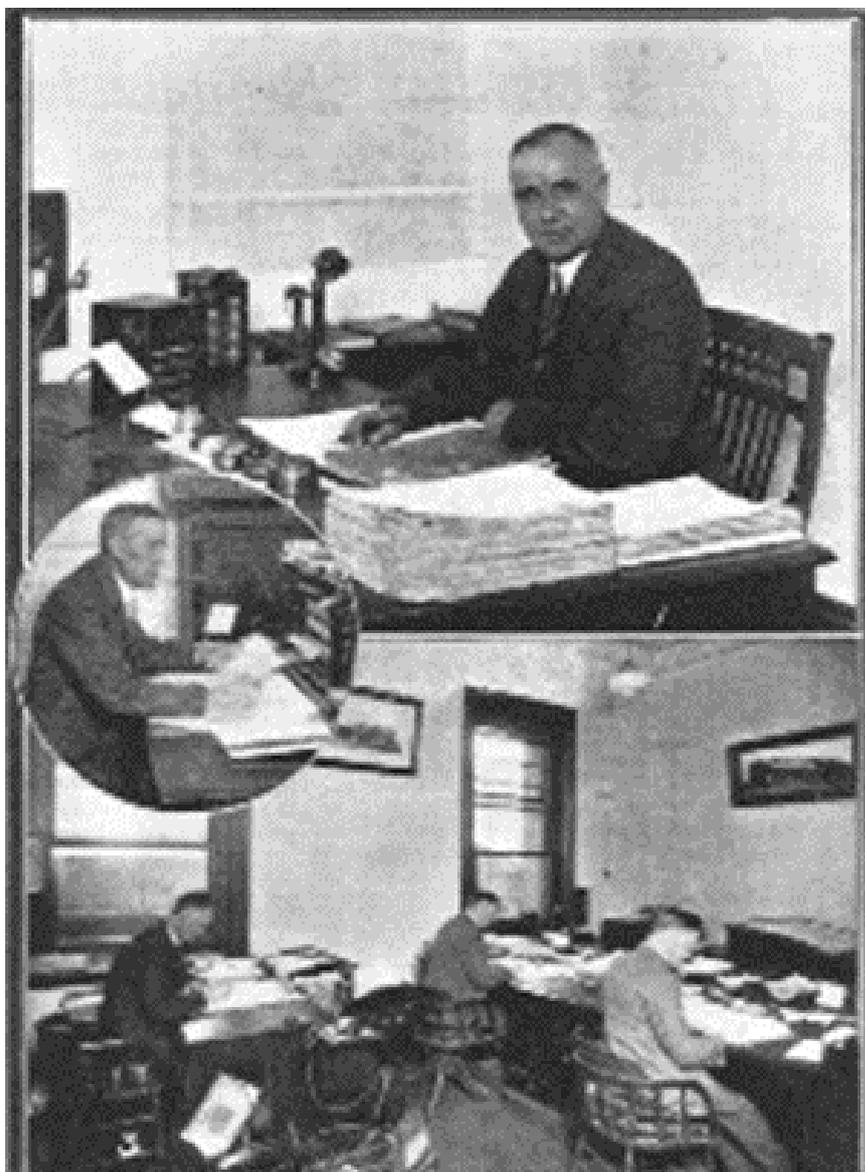
A Glimpse of the Traffic Operating Side of the New Zealand Railways

J. C. SCHNEIDER, *Traffic Superintendent, N.Z.R.* From *The New Zealand Railways Magazine*, October 1, 1932

The activities of the Transportation Branch of the New Zealand Railways cover a wide range. This Branch is responsible for the operation of train services, communications, railway stations, goods depots, and shunting yards. The operations include the transport of all passengers, parcels and goods traffic from the originating station or depot to destination. The following article gives an account of the organisation which is established to ensure prompt, safe and efficient transport of passengers and commodities.

Transportation is an essential part of the process of production. Coal is not of use when it is underground, but to be a utility it has to be brought to the surface, and then transported to the place where it is to be used. The position is similar with regard to any article that is grown, mined or manufactured. The farmer expends labour in producing wheat or wool, but whatever he produces must be moved to the place where it is required for consumption, and this necessary transportation is part of the process of production. Passengers also require to be conveyed to the place where their labour may be best employed, and in the case of holiday-makers, to the spot where they expect to get the maximum of enjoyment or relaxation.

Railway transportation covers the movement by rail of passengers, parcels and goods traffic. The branch controlling this movement operates the equipment provided by other branches, and collects the charges for the service performed. The actual movement of the traffic involves (a) the receiving, loading, conveying, and delivering of goods; (b) the working of stations and goods sheds; (c) the marshalling and breaking-up of trains in shunting yards; and (d) the preparation of timetables and the running of trains in accordance therewith.



New Zealand Railways Transportation Branch.

Top: Mr. J. C. Schneider, Traffic Superintendent; (centre) Mr. F. Herbert, Outdoor Transportation Assistant; (below) Messrs. A. G. Cockroft, J. D. Nash and K. Fanthorpe, members of the clerical staff. (Mr. R. J. A. Stirling, Chief Clerk, absent)

Organisation of the Branch.

Efficient transportation can be secured only by detailed organisation, and by the delegation of responsibility to the various members of the staff, so that

no misunderstanding can arise as to the duty of each member. This organisation is under the direction of the Traffic Superintendent, Wellington, and functions through District Traffic Managers. The railway system of the

Dominion is divided into seven traffic districts:— Auckland, Wellington, Christchurch, Dunedin, Ohakune, Wanganui and Invercargill, with a District Traffic Manager in control of each district. There are five isolated sections: Kaihu, Gisborne, Picton, Nelson and Westport, and the traffic here is worked by the Stationmaster-in-Charge under the supervision of the Traffic Superintendent.

Each District Traffic Manager operates his district by medium of his train running and transport officers, stationmasters and goods agents, with the necessary staff of clerks, foremen, guards, shunters, signalmen, porters, etc. By means of this staff and by personal contact he keeps in close touch with the transportation requirements of passengers and clients. Each stationmaster of necessity comes into close contact with the users of the railway at his station, and is able to advise them as to the best way of despatching or obtaining their goods; and he is able to advise the District Traffic Manager as to the requirements in his district. Every care is taken to ensure that the younger members of the service make themselves efficient in the regulations with regard to charges and general working, so that they will be in a position to give correct and definite infor-

Total passenger journeys, ordinary	6,503,566
Total passenger journeys, season	12,652,034
Total freight tonnage	5,824,811 tons
Net ton miles	481,943,198
Man hours	12,498,612

mation and advice, without hesitation, to the Department's clients. Three examinations have to be passed by these members, and their advancement in the service is conditional on the passing of these examinations. Members are enjoined to show that civility and helpfulness which is the due of all passengers and other clients of the Department. The detailed organisation of the branch, and the hearty co-operation of the staff ensure efficient working of the transportation machine.

The District Traffic Manager is in a position of great responsibility, for in addition to the general supervision of the working of his district and of the staff, involving as it does the maintenance of that discipline which brings efficiency, he is also the medium by

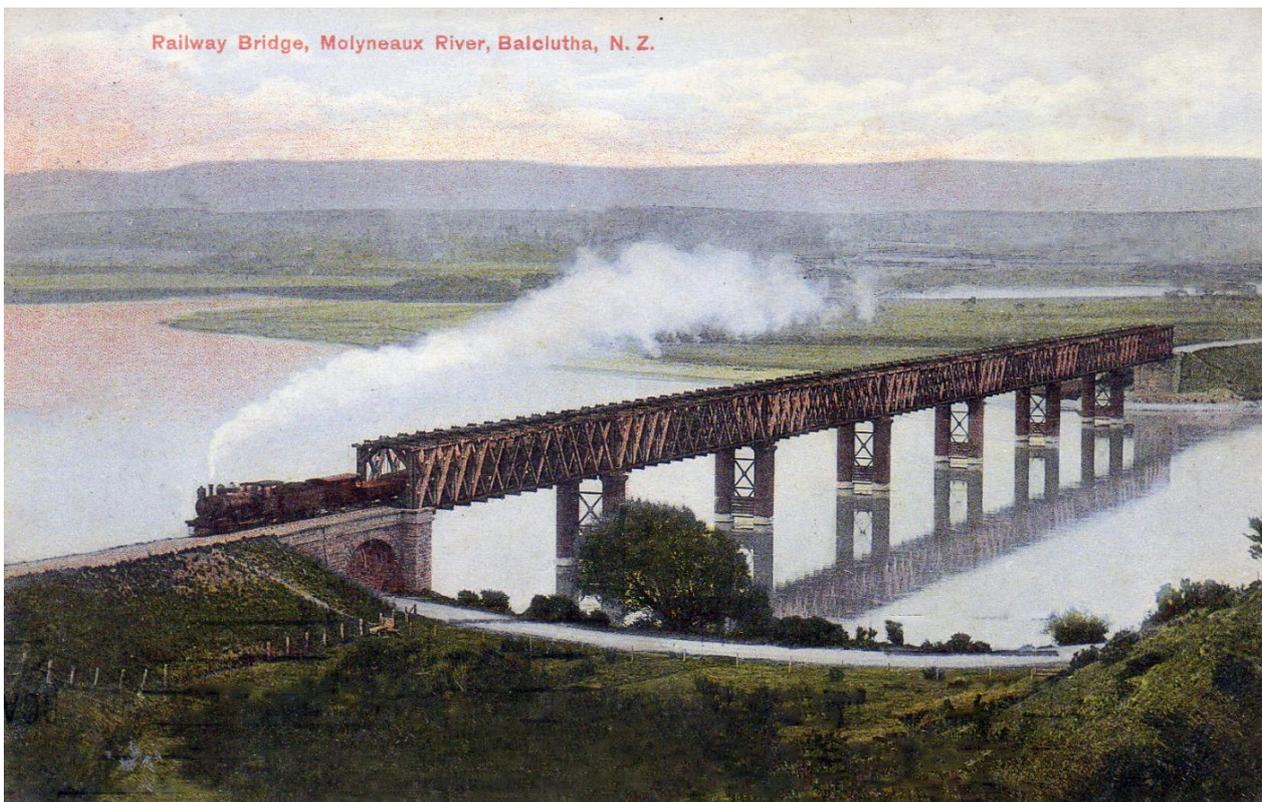
which the general public in his particular district approaches the Department.

Value of Statistics.

It has been found that the statistics compiled in the Chief Accountant's Office in connection with the working of traffic, are of great value to the controlling officer and they are the main check on operating performance.

These statistics, based on data extracted from station returns, waybills and guards' running sheets, are elaborate, and are compiled for each four-weekly period and for each year. They are too extensive to describe in detail, but include revenue results from each district for each class of traffic, revenue per passenger journey, per ton, per ton mile, per train mile, and so on; expenditure for each class of work for

Railway Bridge, Molyneaux River, Balclutha, N. Z.



each district, cost per train mile, per train hour, total freight tonnage passenger journeys, train hours, total engine miles, average train speed, average train load, cost of shunting services, cost of handling goods, cost of operating rail motors, road motors, Lake Wakatipu steamers, and many variations of these statistics.

Some idea of the transport work performed in the course of a year may be obtained from the statistics for one year which, in spite of a time of depression [are shown in the box on page 4].

To move this great volume of traffic, trains are run in accordance with a timetable prepared to meet the requirements of traffic, and the service is increased when necessary by special trains run as directed in special train advices issued by the District Traffic Manager for the district concerned.

All timetables, before being published, are carefully checked in every detail by a specialised staff, and the timetables are plotted on the train diagrams to ensure the maintenance of proper intervals and of suitable crossing stations. The times provided in the timetable or train advice are checked with the mileage and with the authorised schedule of speeds to ensure that a reasonable running time is allowed.

Signalling Systems and Safety.

Various systems of train protection are in force in the Dominion, and it is only on small and unimportant lines that there is not some mechanical form of train protection.

The Tablet apparatus is the main protective system on single lines of railway. This apparatus works electrically, and only one tablet for any section can be obtained from the instruments at any one time. On double lines the protective systems adopted are the Lock and Block signalling and Automatic Signalling. With the Lock and Block system the starting signal at a station cannot be released until the preceding train has cleared the station in advance. This system is still in use between Heathcote and Christchurch and between Dunedin and Mosgiel, in the South Island. Automatic Signalling, however, is the more modern system for double line working. Automatic

Signalling has also superseded the tablet system on several stretches of single line railway. Train Control from central offices is now in operation over a great part of the lines of the Dominion.

The interlocking of signals and points at large stations has contributed largely to the safety of train working, as is also the equipment of all rolling stock with the Westinghouse automatic air brake.

Rules and regulations are laid down regarding the working of trains and signals, and these are strictly applied, each member being examined annually as to his knowledge of the Rules and Regulations. The motto of the Department is "Safety First," and every pre-

caution is taken to ensure safe working. The rule books display prominently the following rule:—

"The first and most important duty of every member is to provide for the safety of the public."

In this matter of safety the Railway Department in New Zealand has built up a splendid record—one of the finest in the world.

Importance of Economy.

But in addition to safety and reliability another factor that has to be kept in view is the necessity for economic working. It is essential that the service be conducted with a minimum of cost. The reduction of goods tonnage due to the present trade depression has been

PRIVATE.



NEW ZEALAND RAILWAYS

SOUTH ISLAND MAIN LINE AND BRANCHES

WORKING TIMETABLE

FOR THE GUIDANCE AND EXCLUSIVE USE OF MEMBERS OF THE STAFF

TO BE OBSERVED FROM 12.1 a.m.

SUNDAY, 14th DECEMBER, 1952

UNTIL FURTHER NOTICE

ALL WORKING TIMETABLES OPERATING PRIOR TO THIS DATE ARE NOW CANCELLED.

The mileages shown in the Working Timetable are not to be taken for the purpose of computing fares, freight charges, etc.; these are to be computed from mileages shown in distance tables.

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All members of the Staff are invited to point out any errors in print which may have escaped notice.

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seriously felt by the Department. The law of Increasing Returns applies to the Railway business, and the greater the volume of business, the less the cost per unit. Much of the expenditure is fixed and does not depend upon the volume of business, so that a rise in volume decreases unit costs, while a drop in the volume of traffic increases unit costs.

The present depression has, therefore, had a serious effect on the Railway finances, and unprecedented efforts have had to be made to counterbalance the fall in revenue. In addition to other economies it has been necessary to curtail train mileage in sympathy with the reduction in traffic and in revenue. In making these curtailments, great care has been exercised to gauge the requirements of the district concerned in conjunction with the traffic being carried, and curtailments have been made only where it appeared that the least inconvenience would be caused to the users of the Railway.

As an indication of the reductions that have had to be made during the past year, it may be stated that train mileage was reduced by 1,198,986 train miles, or 10.45 per cent. This curtailment has been made without serious inconvenience to our clients.

The advent of the motor vehicle, and the great improvement in road surfacing during recent years, has added to the difficulty in holding traffic and maintaining the service on an economic basis.

The Transportation Branch is continually on the look-out for means of improving the service without undue additional cost, and particularly for ways of accelerating despatch of traffic and giving greater convenience to its clients. In this respect a definite programme of improvement to passenger carriages is being carried on as funds available permit. A close contact is kept with modern transport developments, such as those in connection with rail motor vehicles, so that any

development suitable to the conditions peculiar to this country may be exploited when circumstances are favourable. The service is being constantly overhauled to effect every possible economy in operation that will not detract from the value of the service given, as it is recognised that in this time of economic depression the Transportation industry, like all other businesses, must reduce operating costs to maintain stability in the industry. At the same time the Transportation Branch of the Railways keeps in close touch with the business needs of the community, and is fully alive to the imperative necessity for a safe, prompt, and reliable transport service.

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Staff and Ticket Excess

JAMES T WELLS

PUFFING BILLY” is a well-known tourist / heritage narrow gauge railway on the outskirts of Melbourne.

Its safe-working system is “staff and ticket”. There is only one staff (token) per single line section, which the train driver must be in possession of before entering the section. This eliminates the chance of a “cornfield meet”.

To cater for trains following one another, “tickets” are issued to drivers who must sight the staff when receiving them. The last train before the first

one in the opposite direction carries the staff.

Normally in Australia, it would be rare to issue more than a couple of tickets per sequence. Generally this system was used only on rural branch lines with little traffic or on short urban lines with regular traffic patterns.

Puffing Billy’s pink timetable for summer 2016-17 has a situation requiring the issue of many tickets.

The last down train of the day arrives Menzies Creek at 3 pm; there are then four up trains leaving Menzies Creek

to return to Belgrave before the day closes. So it looks like Menzies Creek will issue three tickets.

In fact they will issue seven because in summer each train is followed by a fire patrol (ganger’s) trolley. The railway, as is commonplace nowadays, treats these as trains required to comply with safe-working rules.

A similar situation exists in the down direction in the morning with three trains plus trolleys, all running to Menzies Creek before the first up train.

FROM BELGRAVE

Belgrave dep:	10.30	11.10	12.30*	1.15	2.30
Menzies Crk arr:	10.53	11.33	12.59	1.47	2.53
Menzies Crk dep:	11.05	11.38	1.05	1.55	3.00
Emerald dep:	11.20	11.53	1.15	2.10	3.15
Lakeside arr:	11.30 ^c	12.08	1.30	2.20	3.30
Lakeside dep:	...	12.20	...	...	...
Cockatoo dep:	...	12.35	...	...	...
Gembrook arr:	...	1.00	...	...	...

FROM GEMBROOK

Gembrook dep:	...	...	2.45	...	...
Cockatoo dep:	...	...	3.05	...	...
Lakeside arr:	...	...	3.20	...	...
Lakeside dep:	12.30	2.30*	3.45	4.20	5.00
Emerald dep:	12.45	2.45	4.00	4.30	5.10
Menzies Crk arr:	12.57	3.02	4.12	4.42	5.22
Menzies Crk dep:	1.00	3.05	4.15	4.45	5.25
Belgrave arr:	1.25	3.30	4.40	5.10	5.50

* Includes Steam & Cuisine Dining Carriage.

THOMAS shows in October to SANTA SPECIALS in
THE 36TH GREAT TRAIN RACE
 Sunday 30th April 2017. A



ENQUIRIES & BOOKINGS



TIME TABLES

OCTOBER 2016 - APRIL 2017

TIME TABLES 1 OCTOBER 2016 - 30 APRIL 2017

Select the date for travel, then refer to the time table below in the same colour as in the date square.

OCTOBER 2016							NOVEMBER 2016							DECEMBER 2016							JANUARY 2017							FEBRUARY 2017							MARCH 2017							APRIL 2017																
M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S										
					1	2			1	2	3	4	5	6					1	2	3	4							1			1	2	3	4	5						1	2	3	4	5											1	2
3	4	5	6	7	8	9	7	8	9	10	11	12	13	5	6	7	8	9	10	11	2	3	4	5	6	7	8	6	7	8	9	10	11	12	6	7	8	9	10	11	12	3	4	5	6	7	8	9										
10	11	12	13	14	15	16	14	15	16	17	18	19	20	12	13	14	15	16	17	18	9	10	11	12	13	14	15	13	14	15	16	17	18	19	13	14	15	16	17	18	19	10	11	12	13	14	15	16										
17	18	19	20	21	22	23	21	22	23	24	25	26	27	19	20	21	22	23	24	25	16	17	18	19	20	21	22	20	21	22	23	24	25	26	20	21	22	23	24	25	26	17	18	19	20	21	22	23										
24	25	26	27	28	29	30	28	29	30					26	27	28	29	30	31		23	24	25	26	27	28	29	27	28						27	28	29	30	31			24	25	26	27	28	29	30										
31																					30	31																																				

FROM BELGRAVE

Belgrave dep:	10.30	11.10	12.30*	2.30
Menzies Crk arr:	10.53	11.33	12.59	2.53
Menzies Crk dep:	11.05	11.38	1.05	3.00
Emerald dep:	11.20	11.53	1.20	3.15
Lakeside arr:	11.30 ^a	12.08	1.40	3.30
Lakeside dep:	....	12.20	....	....
Cockatoo dep:	....	12.35	....	....
Gembrook arr:	....	1.00	....	....

This time table supersedes any previous versions. ■ Closed Christmas day. ■ Great Train Race - special time table applies.

10.30	11.10	12.30*	2.30
10.53	11.33	12.59	2.53
11.05	11.38	1.05	3.00
11.20	11.53	1.20	3.15
11.30 ^a	12.08	1.40	3.30
....	12.20	....	....
....	12.35	....	....
....	1.00	....	....

9.50	10.30	11.30	....	12.30	1.55	....	3.40
10.13	10.53	12.03	....	1.08	2.20	....	4.12
10.15	11.00	12.10	....	1.10	2.28	....	4.24
10.29	11.15	12.25	....	1.26	2.55	....	4.40
10.45	11.28 ^c	12.40 ^c	....	1.41 ^c	3.10 ^c	....	4.52
11.00	....	....	12.55	....	....	4.00	....
11.15	....	....	1.10	....	....	4.15	....
11.40	....	....	1.35	....	....	4.40	....

FROM BELGRAVE

Belgrave dep:	....	....	2.45	....
Cockatoo dep:	....	....	3.05	....
Lakeside arr:	....	....	3.20	....
Lakeside dep:	12.30	2.25 ^a	3.40	4.15
Emerald dep:	12.45	2.40	3.55	4.25
Menzies Crk arr:	12.57	2.57	4.07	4.37
Menzies Crk dep:	1.00	3.00	4.08	4.38

FROM GEMBROOK

Gembrook dep:	....	....	2.45	....
Cockatoo dep:	....	....	3.05	....
Lakeside arr:	....	....	3.20	....
Lakeside dep:	12.30	2.25 ^a	3.40	4.15
Emerald dep:	12.45	2.40	3.55	4.25
Menzies Crk arr:	12.57	2.57	4.07	4.37
Menzies Crk dep:	1.00	3.00	4.08	4.38

....	....	2.45	....
....	....	3.05	....
....	....	3.20	....
12.30	2.30*	3.45	4.20
12.45	2.45	4.00	4.30
12.57	3.02	4.12	4.42
1.00	3.05	4.15	4.45

....	11.55	....	2.50	....	....	5.10
....	12.15	....	3.10	....	....	5.30
....	12.30 ^b	....	3.25 ^b	....	....	5.45
11.40	....	1.55	....	2.35	3.50	5.20
11.55	....	2.10	....	....	4.05	5.35
12.09	....	2.22	....	3.14	4.17	5.47
12.13	....	2.30	....	3.28	4.25	5.50

FROM GEMBROOK

Belgrave dep:	....	....	2.45	....
Cockatoo dep:	....	....	3.05	....
Lakeside arr:	....	....	3.20	....
Lakeside dep:	12.30	2.25 ^a	3.40	4.15
Emerald dep:	12.45	2.40	3.55	4.25
Menzies Crk arr:	12.57	2.57	4.07	4.37
Menzies Crk dep:	1.00	3.00	4.08	4.38



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The representation of time in Australian transport timetables

GEOFF LAMBERT

A FORTNIGHT AGO, at 9 in the forenoon, I wandered 3M20C down the road to the GPO and stuck a d in the weighing machine, to discover my weight as 14St 5lb. Since I am only 2½ cubits tall, I decided to go on a diet and to cut my beer-swilling down to 1 gill per day.

Make sense to you? If “yes”, you are a fuddy-duddy who lives in the past. We fuddy-duddies have a hard time explaining these things to our grand-kids. Imagine trying to explain them to your American relatives or to *their* grand-kids.

This is *arcana* in the extreme and now mostly relegated to the generation gap but it was not always thus. In recent issues of *The Times*, we reproduced Mike Esbester’s article on “*Designing Time*” in which he discussed, *inter alia*, the representation of time in British railway timetables.

The principal idea of a public timetable is to communicate. It is to transfer the thoughts of the scheduler into the minds of millions of diverse customers or potential customers. To make this bridge, a scheduler’s thoughts must be presented to the travellers mind in a way that minimizes bafflement, confusion and missed connections. It is like mind-reading. The scheduler may imagine what a timetable **ought** to look like, but travellers probably do not – or at least have a very wide opinion on the matter.

Variety may be the spice of life, but the bread and butter of life is consistency. Notions and representations of time – especially time when presented as printed symbols- vary widely. The clock-face “timetable” of Craig’s Family Hotel presented in *The Times* of February 2016 is a perfect example of reaching all minds through the simple expedient of pattern recognition. The drinkers didn’t need to be literate, numerate or even sober to read Craig’s timetable. Indeed, it would be misleading to call it a “table” at all.

This mechanism breaks down when a multiplicity of times must be presented. Enter George Bradshaw – the progenitor of a zillion timetables good and bad. Esbester (*op cit.*) describes the lengths to which compilers of timetables sometimes went to in order to (for instance) distinguish times before midday from times after midday.

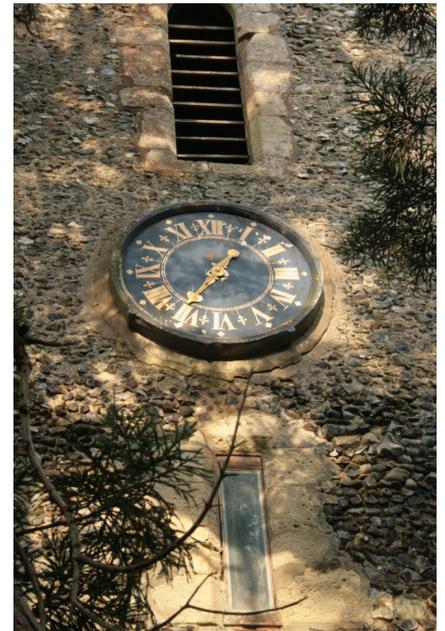
I have discussed previously the mental framework which underlies our perception of time and how this perception was greatly codified by the invention of the railway (*The Times*, December 2014). This codification spread far beyond the railway into every aspect of industrial and post-industrial life. For time to make sense to those who had to wrestle with it, it had to be presented to them in a sensible manner.

For more than a century there has been “Standard Time” – a time born out of “Railway Time”. It was not until the late adolescence of the computer age (when time became, as it were, a manipulatable object) that we needed to have representations of time which made sense to both humans and machines. Out of this, the International Standard ISO 8601 was born.

ISO 8601 *Data elements and interchange formats – Information interchange – Representation of dates and times* is an international standard covering the exchange of date and time-related information. It was issued by the International Organization for Standardization (ISO) and was first published in 1988.

The purpose of this standard is to provide unambiguous and well-defined methods of representing dates and times, so as to avoid misinterpretation of numeric representations of dates and times, particularly when data are transferred between countries with different conventions for writing numeric dates and times.

In general, ISO 8601 applies to representations and formats of dates in the Gregorian calendar, times based on the 24-hour timekeeping system (including optional time zone infor-



My niece Bree was married in Staple in Kent, where the church clock has only one hand. She was late – but brides always are, of course.

mation), time intervals and combinations thereof. The standard does not assign any specific meaning to elements of the date/time to be represented; the meaning will depend on the context of its use.

In addition, dates and times to be represented cannot include words with no specified numerical meaning in the standard (e.g., names of years in the Chinese calendar) or that do not use characters (e.g., images, sounds). [https://en.wikipedia.org/wiki/ISO_8601]

This is not as simple as it may seem. Human-readable time is a *mélange* of Arabic (i.e. decimal) numeric representation with a non-decimal division of time. There are 60 seconds in a minute, 60 minutes in an hour and two lots of 12-hours in a day. Thus times could range from (say) 00:00 to (say) 23:59 [or even 24:00], but values such as 17:99 are meaningless to the eye, even though they can be correctly interpreted by a computer (in this case, as 18:39). Similar difficulties apply to the representation of dates. Representing date and time together increases the difficulty.

In words --->	six minutes past nine AM	Allowed	six minutes past nine PM
In 4-digit form --->	0906	ISO 8601?	2106
Decimal days	42616.37957546	no	42616.87957546
h mm	9 06	no	21 06
h.mm	9.06	no	21.06
h:mm	9:06	no	21:06
hmm	906 AM	no	906 PM
hm	96	no no no!	216
hmm	906	no	2106
h:mm AM/PM	9:06 AM	no	9:06 PM
hh mm	09 06	no	21 06
hh.mm	09.06	yes	21.06
hh:mm	09:06	yes	21:06
hhmm	0906	yes	2106
hmm	906	no	2106
Roman	IX:VI	no	XXI:VI

To a physicist, the “unit of time” is the second, defined as the time it takes for about 9 trillion wavelengths of the light emitted from a Cesium atom, when one of its electrons make a particular orbital transition, to pass the physicist. This is hardly likely to make sense to a person reading a timetable nor to a computer compiling one. The agreed time standard for representing time in a computer is the day. Thus, the time of 6PM is 0.75 in computer-speak.

If one is to represent dates, one must have a starting point –that is to say, the definition of Day 0. Microsoft and Apple have chosen different starting points – 1-Jan-1900 and 1-Jan-1904 respectively for rather abstruse but fascinating reasons. When I wrote these words it was 6 minutes past 9 PM on Saturday 3rd September 2016. The time in Bill Gates-speak is 42616.87957546. Can you work out what time this is in Steve Jobs-speak? [hint 1900 was NOT a leap-year ... which is why Steve disagreed with Bill.]

Now we have reached the crux of the problem – how to represent a time such as 42616.87957546 in a consistent manner that reaches the consciousness of the maximum number of potential readers and also make unambiguous sense to a computer (when the

time is scanned, for instance). Technically this is easy, but psychologically it is not. Above is Excel’s many different ways of automatically representing this particular time.

In the above table “h” stands for “hours” and “m” stands for minutes. Other variants, such as “a.m.” instead of AM are also disallowed. The ISO 8601 standard bans all of those representations that are shown with a “no”. Only those times that follow the following conditions fit the Standard:

- 24-hour clock
- 4 digits
- Leading zeroes
- No separator or only period or colon

The Commonwealth Government’s “Style Manual” is somewhat more relaxed about whether, for instance, AM can appear as a.m.; ISO is not relaxed at all. One can see why some times are “no-no”s, especially those that do not have four digits. A representation like “906” is very likely to be mistaken for some other sort of number such as “Miles from Miles” – especially in a transport timetable which is a mix of all sorts of information. An example of where such confusion could easily occur is shown in Fig 1- TransAdelaide Tram WTT. Only one Australian transport timeta-

ble breaks this rule. It is, however, broken by the biggest passenger timetable in the world—that of Japan.

List of formats used and who uses them

The list on page 11 shows the variety of time formats which could be, or are, used in Australia. This includes at least one format which is not computer readable – times in the 12-hour clock where there is no indication of AM/ PM next to the times. In such table one needs to read this information from the top of the table. The Japanese JTB “Big Book” railway timetable is like this.

In 33 distinct A&NZ timetables, I found 11 different ways of representing time. Of these 33 timetables, only 14 adhere to any ISO standard (those in bold italic). Note that the ISO standard also allows for the consistent representation of seconds or fractional minutes, but only GTFS timetables (e.g. Sydney Buses GTFS) actually use it. In some cases the same operator may use different formats for different modes or have different formats for Public and Working Timetables.

P.S. Did you know that a speed of 1 centimetre per minute is almost exactly 1 furlong per fortnight? (try it in Excel and see!)?

How Time is Represented in Australian Transport Timetables

		format--->	h mm	h mm	h.mm	h:mm	hmm	hm	h:mm	hh:mm	hh:mm	hh mm	hh.mm	hh:mm	hhmm	hmm	hh:mm:ss	Number	Total
		Example--->	12-HOUR	9 05	9.05	9:05	905 AM	95	9:05 AM	09:05 AM	09 05	09.05	09:05	0905	905	9:06:00	Different	TTs	
State	System/mode	TT type	3	0	1	9	0	0	1	1	2	1	9	4	1	1	11	33	
ACT	Action	PTT			X														
AUS	ARTC	MTP											X						
AUS	QANTAS	PTT												X					
AUS	TRRAINTIMES	PTT/WTT													X				
INT	GTFS	PTT														X			
NSW	John Holland	SWTT												X					
NSW	NSW TRAINS	PTT												X					
NSW	Sydney Buses	PTT				X													
NSW	Sydney Ferries	PTT				X													
NSW	SYDNEY TRAINS	PTT												X					
NSW	TfNSW	SWTT									X								
NT	FREIGHTLINK	WTT												X					
NZ	MAXX	PTT				X								X					
NZ	TRANSMETRO	PTT				X													
NZ	WELLINGTON BUS	PTT	X																
QLD	AIRTRAIN	PTT				X													
QLD	CITYTRAIN	PTT				X													
QLD	PNQ	WTT												X					
QLD	QR SUBN	WTT																	
QLD	Translink	PTT				X													
QLD	TRAVELTRAIN	WTT													X				
SA	METRO BUS	PTT	X																
SA	TRANSADELAIDE	WTT													X				
TAS	Hobart	PTT							X										
VIC	Metro Trains	PTT				X													
VIC	Metro Trains	WTT									X								
VIC	PTV	PTT												X					
VIC	PTV BUS	PTT								X									
VIC	SkyBus	PTT												X					
VIC	V/LINE	NSP													X				
VIC	VLINE	PTT												X					
WA	Transperth	PTT				X													
WA	TRANSPERTH FERR'	PTT	X																

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A self-correcting timetable

MAX MICHEL

THERE IS NO SUCH THING as a self-correcting timetable overall, but there are techniques available that can minimise the adverse effects of many of the day to day vagaries of train running, particularly on single lines.

Tailem Bend

The first time I was aware of such a situation was with the up Mt Gambier overnight mixed between Wolseley and Tailem Bend running against a flight of eastbound freight trains as well as the Overland. The mixed had crossing times early in its main line ventures that allowed it to be advanced if the opposing trains were more than a few minutes late (which was a quite frequent occurrence).

Harefield

There is currently a good example at work in Southern NSW – the meeting of the north and southbound XPT trains scheduled for Harefield. In the last year or so I have had two instances which highlighted the effectiveness of this particular tactic as a means of not only limiting the damage from late running but in some cases actually improving the overall situation.

Firstly though, let's lay out the playground –

Juneec (485.7km) is the end of double track from the north, but only has one operational platform. Passenger trains can cross if the up train arrives onto the up main north of the platform then reverses (requiring the driver to change ends) to the platform

once the down has gone. Drivers always change here so a 'spare' should be available if need to help with this manoeuvre. Of course, if the down is fearfully late then the two will simply cross on the double line somewhere north.

Harefield (497.6km) is a standard CTC crossing loop around 900 metres long.

Bomen (507.6-514.6km) is a 7 km long Passing Lane with 80 km/h entry/exit turnouts. The north end is not far south of Shepherds while the southern end is at the Wagga end of the former Bomen loop.

Wagga (521.2km) is a passenger platform on a normal 900 m CTC crossing loop. This place is quite impractical as a crossing place for two

passenger trains.

Uranquinty (534.9-541.9) is a 7 km Passing Lane with its northern end close to the old station (now out of use).

The current WTT times for the XPT Day Trains is as in the upper table.

Note that XPT public train times are the WTT arrival times – trains may depart at those times. On a normal day the XPT trains will be running a couple of minutes ahead of the WTT in line with this principle.

When things are normal there is no problem (other than the scheduled delay to ST24 at Harefield) but if one or other train runs late—then what happens? ...

ST23 RUNNING LATE; ST24 ON TIME is in the middle Table below,

ST24 RUNNING LATE; ST23 ON TIME is in the lower Table, below

So, under normal conditions, the XPT's are tabled to dwell for 12 minutes. If the Southbound ST23 is running more than 6 minutes late, there will be no further loss of time (either way). If northbound ST24 is running up to 39 minutes late the aggregate dwell will not exceed the 12 minutes already in the WTT. Only if ST24 is more than 39 minutes late does the whole thing start to unravel.

There will be other factors that may change the situation on the day, providing an outcome different to the above. Proximity of other trains is one

such, as is crewing, coach connections and other ancillary activities. However overall the existing timetable for XPT's in the Junee – Wagga area has to be categorised as 'robust'.

Bungaree

I note that most, if not all, down off peak Ballarat trains (all DMU Vlo-cities) are scheduled via the old line through Bungaree (8 minute section time) while the up equivalents are tabled via the new line to cross the down (3 minute section time). The down trains have 'blob' times at Bacchus Marsh and Ballan allowing them to depart 4 minutes ahead of the WTT. Think about why the cross at 'Bungaree' might be tabled the way it is.

The current WTT times for the XPT Day Trains is as follows:-

	READ DOWN	READ UP
	ST23	ST24
Junee	13.27/30	13.51/54
Harefield	!3.38* xST24	13.29/41 xST23
Bomen	13.46*	13.19*
Wagga Wagga	13.54/58	13.07/11
Uranquinty	14.08*	12.56*

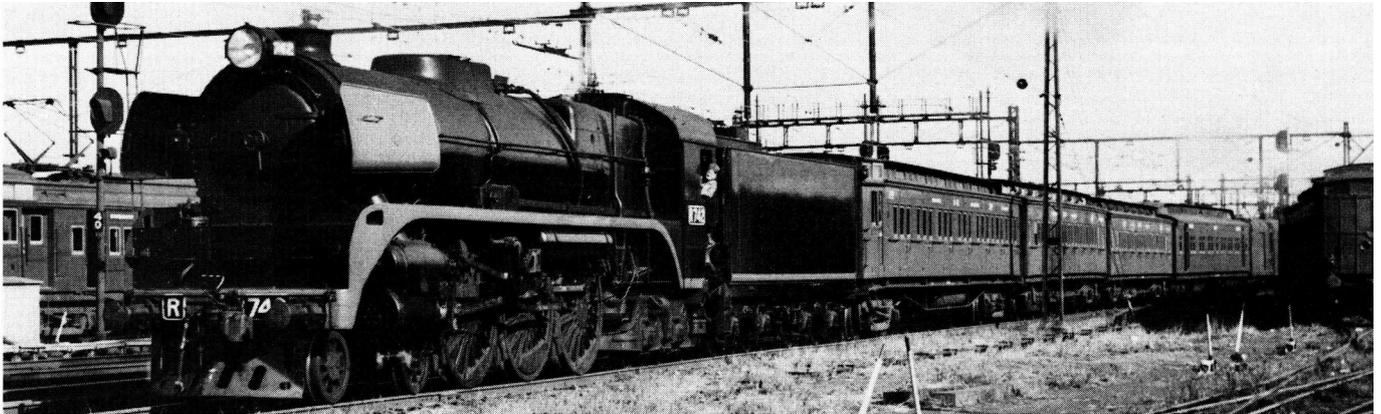
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ST23 RUNNING LATE (ST24 ON TIME)			
Mins Late (ST23)	Outcome for ST24	Outcome for ST23	Delay for Cross
On Time	12 mins dwell at HFD as tabled	As tabled	12 minutes
ST23 => 6mins late	Advance to Junee to cross ST23 – arrive on up main then go to platform after ST23 departed	Run => 6 mins later than tabled	0 minutes
ST23 > 25 mins late	Advance to Junee – depart on time; cross on double line	Run >25 mins late	0 minutes
ST24 RUNNING LATE (ST23 ON TIME)			
Mins Late (ST24)	Outcome for ST23	Outcome for ST24	Delay for Cross
On Time	As tabled	12 mins dwell at HFD as tabled	12 minutes
ST24 => 12mins late	As tabled	Reduced dwell at HFD then on time	0-12 minutes
ST24 >12 but <20 mins late	Hold at HFD for cross – up to 10 minutes delay	Run to HFD for late cross. Lateness 0-8 minutes late.	<10 minutes
ST24 >20 but <27 mins late	As tabled	Hold at Bomen for cross; 5 – 0 minutes delay	5-0 minutes
ST24 >27 but <50 minutes late	Hold at Bomen for cross; ST 23 delayed up to 23 minutes	Run through Bomen and HFD, no dwell.	0-23 minutes
ST >50 minutes late	As tabled – on time	Hold at URQ for cross – delay from 22 – 0 minutes	22-0 minutes



Travelling with Ted

There and Back Again on the 1963 School Train by **GEOFF LAMBERT**



The alarm goes off at 6AM on the coldest morning of the year—27°F. Outside, the dog is shivering, waiting for his morning walk by the railway line. As soon as I draw on my gumboots, we are away. The cow paddock is frozen solid and as we wade through the Capeweed, it disintegrates into glittering shards of green. We leave a trail behind us like a Martian Canal.

A headlight appears in the cutting and I hear the whine of dynamic brakes as No. 198 Fast Goods, comes hurrying down from Rowsley. It needs to get to Parwan before the first Passenger train of the day can leave for “town”. Soon, the dinging of the Electric Staff machine indicates that it has achieved its goal. The clattering of the signal frame heralds that Tom Swan is setting up the road for the next moves.

Down in the station yard, we now hear the deep-throated moan of the DERM as it starts away with No. 108 worker’s commuter train—Jim Guy’s train. Jim Guy is the perennial commuter and commercial artist, has made this train his own, after travelling on it for so many years. Probably, Dan Pianta is driving. By the time the DERM reaches Parwan nine minutes later, I am on my way home for breakfast. Down in the station yard, D₃639 is stirring – out onto the main line it goes and backs into No.1 road pushing its creaking collection of ancient carriages.

Breakfast is over and done with by

7AM, After making sure I have my school cap atop my head lest the Sunshine High School Headmaster has sent another spy to check, I am away. I meet schoolmate Jim Stanley as he buys a copy of *The Age* at the wicket gate. The paper has come to the station via the Fast Goods (News) train a few hours before. We proceed to the train and turn on the carriage lights and give the foot-warmers a good shake as we walk through to our preferred compartment at the very front of the train.

There ...

There is just a little time for a quick word to Driver Ted Cody and his fireman Frank, before we must return to our seats through the swirling steam now being illuminated by the rising sun. Clattering past the Bull Farm, we can see the disconsolate animals stamping restlessly and creating their own clouds of steam. Up through the dark defile of the cutting, we finally

emerge into the crepuscular sunlight again and draw to a stop to pick up a lone passenger at Parwan. In the loop is the Down Empty Coal train, drawn by one of Ted’s most-hated engines— a T-class. “*Bone-shakers ...*” Ted calls them, “... can’t sleep at night.” He may be driving it later in the day.

It is an exhilarating run down the hill through Staughton’s Siding and over the Melton Viaduct whenever Ted is at the regulator of a steam locomotive. A bit of a hell-fire Jack is Ted. So much so, in fact, that he over-runs the platform at Melton. The office girls waiting to travel in the first car, a BC dog-box, are not amused. “Back-up” Ted, they chorus. “No—bugger that” says Ted, “travel in car two”. Ted makes this appear to be his usual contrariness, but he is really just obeying the rules.

Once we get over the top of the hill,





Ted is away like a racer again and soon we gasp to a stop at Rockbank. This procedure is repeated for the next section to Deer Park. As we crest the last grade at the site of the never-built station of Hilton, Melbourne, lying under a brown saucer of smog, emerges from the lava plains.

Deer Park, long bereft of its namesake deer, now has an armaments factory instead; the smell of nitrogen dioxide alerts us to the fact that Jim and I are approaching our destination. We are often held up on the Down side of Anderson Rd, but today we have a clear run into the platform. We disembark here and shake hands with Ted and Frank, before they chuff off to Spencer St. If we feel inclined, and have the time, we may wait to watch the Overland decant its passengers for the north-bound Intercapital Daylight Express. Then, *“the whining school-boys, with their satchels, and shining-morning faces, creep like snails unwillingly”* to Sunshine High School. The pits of all schools, we reckoned.

... and Back

We are released from our misery at 4 PM and, by 4:20 are back at Sunshine Station with 22 minutes to spare. Our train is just about to leave Spencer St. We while away the time wandering up and down the platform watching the passing parade. This is mostly “sparks”, with perhaps a passing Goods on either the Broad or Standard Gauge tracks. Sometimes there is a steam loco in No. 3 platform, idling

away on some unexplained errand.

There is an air of anticipation as train time approaches and we scan the horizon for a glimpse of it as it appears around the bend from White City—DERM? ... DRC? ... Steam? The WTT says DERM, but we often get a DRC – less beastly and boring. But we hope for steam.

On this day, the Up Bacchus Marsh Coal train has come and gone and Frank and Ted are up in the Signal Box. This presages steam, perhaps ... and so it turns out to be—R707 with

its cars in tow finally appears through some scudding rain. We watch the goings on at the business end, where Ted and Frank replace the North Melbourne crew. Words are being exchanged – Ted seems quite unhappy.

We wait.

Eventually we move away at an acceptable, but definitely more sedate, pace than we expect from Ted. At Deer Park, we pause again and it becomes apparent that something is wrong up front. Nonetheless, because we have The Jet on our tail, we are obliged to move. It is no use. At the top of the bank, at Hilton—otherwise known as RMSP64—we wheeze to a halt. Steam trains when substituting for rail-motors are not supposed to stop at RMSPs. Driving D3639 one night Ted forgot this and had to be reminded by the passengers to get going again.

Tonight, though, “getting going” is beyond the capacity of R707. “We’re out of steam”, Ted shouts back to the heads craning out the windows. “We’ll be here for twenty minutes – enough time to pick the daises”. So, amid the dull roars of the stoker and the blower, that’s what we do until Ted calls us back with the whistle. We clamber aboard with armfuls of Capeweed and



the train trundles down to Rockbank. More time is spent here raising steam, and we leave 45 minutes late. Ten more minutes to draw breath at Melton – and at last the horse feels her oats and we fly along at Ted’s normal pace, gaining 5 minutes of our 55-minute deficit. In the loop is the delayed Up *Sunlight* waiting for a quick getaway.

Before we left Melton, No. 57 was already panting at Rockbank, waiting for the road. At the Marsh it is still panting but is now at Parwan. Ted must get #53 out of the way – back out to the mainline and shunt to number 3 road. Jim and I would often be part of this, but tonight we are all in a hurry.

No 57 is headed up the Ingliston Bank by the time I reach home. Down in the yard, Ted has uncoupled the loco, sawed it into the turntable road, turned it, Frank has cleaned the fire and the engine has been returned to the Up end of the train. There it slumbers all night, with Ted keeping a watchful eye on it from his house in the station yard only a few yards away.

As one might reasonably and correctly imagine that these two “There and Back” trips did not happen on the same day. The stories, however, are true—with much more besides, such as :

- The day Ted left the cars behind as we came over the Parwan Creek Trestles or;
- The day the Sunshine Tech boys dismembered the Guards Van and threw the contents into Parwan Creek.

Steam was a welcome but relatively unusual occurrence on the “School Train” in 1963, the year of my stories. Usually the morning Up, No18 was a diesel-hauled pass, the empty cars arriving at Bacchus Marsh from Melbourne before 6AM. The afternoon Down was scheduled for a DERM, but was more often a 280HP DRC and trailer. On arrival at the Marsh, and when Ted was driving, we could be guaranteed that we would be offered the opportunity of accompanying Ted as he ran around the trailer. My overwhelming memory of this is the heat, smell and noise of the driving com-

partment as we all changed driving ends – 4 times in all, to put the DRC to bed in the car siding.

On days when the Down was loco-hauled instead of being a DRC or DERM, there had to be a way of getting a DRC or DERM to Bacchus Marsh for Jim Guy’s train, but I have no memory of how it was done, nor have I seen a timetable for it.

Ted Cody

A railfan book once misnamed Ted as Bill Cody, mistaking him for Buffalo Bill. [picture on page 13]. But Ted was indeed something of a Hellfire Jack.

It was Ted, who introduced me to the concept of railway enthusiasm – “maniacs” he called them, with some asperity. He had not long before been a driver on an ARHS fan trip to Ballan, run by double-headed A2 and R class locos (picture below). As a reward, the ARHS had made him an Honorary Member- including a subscription to “*Bulletin*”. Ted had no time for this sort of fluff, so he gave his accumulated Bulletins to my Dad, to pass on to me. I never realised until then that there were so many nutters in the railway world- but I quickly became one and have been unable to escape their clutches.

Pages from the 1963 WTT illustrate this article and, more or less, show in order:

- How the Empty Cars normally get to Bacchus Marsh for No. 14.
- The return trip of the School Train (right-most column).
- No 57, on the day described, was held behind #53 several times.
- How No 18 left Bacchus Marsh at 07:20 after decades of leaving at 07:14.
- The Sunlight was held up by #53 on the fateful day.
- No 15 coal train makes a slow journey, meeting #18 at Parwan.
- No 198 and 140 play a different game of leapfrog almost every day of the week and manage to stay out of the way of both Up passenger runs.
- When #53 is loco-hauled crews swap between it and #94 coal at Sunshine.

The colour slides of the School Train come from the Weston Langford Collection.

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ARARAT-MELBOURNE—Passenger Service

Up

STATIONS	80 EXPRESS MON., SAT.	108 Diesel Electric Rail Motor and Trailer Mon. to Fri.	18 PASS. MON. TO FRI. Diesel Electric Rail Motor and Trailer Sat.	10 " THE OVER- LAND " DAILY SUN. INCL.	2 280 h.p. D.R.G. Mon. to Sat.
	A.M.	A.M.	A.M.	A.M.	A.M.
ARARAT ES W ...	arr. ...	...	...	5 17-101	...
Buangor O ES ...	dep. ...	...	...	5 20	...
Middle Creek O ES ...	arr. ...	...	...	5 37*	...
(See note, page 12)	dep. ...	...	...	5 41*	...
Beaufort ES W ...	arr. ...	...	...	5 54*	...
Trawalla O ES ...	dep. ...	...	...	5 59*	...
(See note, page 12)	...	...	...	...	...
Burrumbeet O ES ...	...	...	...	6 11*	...
Windermere O ES ...	arr. ...	...	...	6 15*	...
(See note page 12)	dep. ...	...	...	6 23*-9	...
Linton Junction ES ...	...	...	...	*	...
Wendouree NC ...	...	...	...	6 30*	...
North Ballarat Junction ...	5 12*	...	...	6 35	...
BALLARAT WG ...	arr. ...	...	...	6 55E	7 5
(See note, page 12)	dep. ...	...	...	6 57*	7 8
Ballarat East O ...	5 22*	...	...	7 5*	7 17
Warrenheip ES ...	5 29*	...	...	*	...
Dunnstown ...	*	...	...	7 12*	...
Bungaree ES ...	arr. ...	...	...	*	...
Wallace O ...	dep. ...	...	...	*	...
Millbrook ...	*	...	...	7 20*	...
Tordon O ES ...	arr. ...	...	...	...	...
Rail Motor Stop. Place, No. 77 NC ...	dep. ...	...	...	...	...
BALLAN ES W ...	arr. ...-198	...	...	...	...
Bank Box Loop ...	dep. ...	...	...	...	...
Bacchus Marsh ES W ...	arr. ...-5	...-5, 198	...-15	7 26*	...
Parwan O ES ...	dep. ...	6 23	7 20	7 34*	...
Melton ES ...	arr. ...	...-5	...	7 45*	...
Rail Motor Stop. Place, No. 65 NC ...	dep. ...	6 14††	7 28-15	7 50*	...
Rockbank O ES ...	arr. ...	6 19*	6 32	7 57*	...
Deer Park O ES ...	dep. ...	...-15	7 38	...	...
(See note, page 12)	arr. ...	6 27*	6 43-15	...	...
Sunshine ES ...	dep. ...	Z	¶	...	...
White City NC ...	arr. ...	...-198	...-198	...	...
Fottenham O ...	dep. ...	6 33*	6 51	8 2*	...
Vest Footscray ...	arr. ...	Z	¶	...	...
Middle Footscray O ...	dep. ...	6 40*	7 2	...-15	...
Footscray ...	arr. ...	...	...	8 10*	...
South Kensington O ...	dep. ...	...	...	...	...
North Melbourne ...	arr. ...	...	...	...	...
MELBOURNE WG (Spencer St.) arr.	dep. ...	...	...	...	...
	80	108	18	10	2

See page 13, re stopping at Sunshine

To Geelong:

Mon. to Sat.	Sunday
8 15F	8 15*
8 17	*
*	*
*	*
*	*
8 25*	8 25*
*	*
8 31*	8 31*
8 35	8 35

F. Stops to set down passengers holding reservations on the "Intercapital Daylight" the same day.

E. Passengers are not permitted to join No. 10 Express at Ballarat, except those holding reservations on the "Intercapital Daylight" the same day.

Down

MELBOURNE-ARARAT—Passenger Service—continued

STATIONS	15 280 h.p. Diesel Rail Car Mon. to Sat.	25 PASS. MON. TO SAT.	109 Diesel Electric Rail Motor and Trailer Saturday	49 PASS. SAT.	49 PASS. MON. TO FRI.	11 153 h.p. Diesel Rail Car and Trailer Mon. to Fri.	53 Diesel Electric Rail Motor and Trailer Mon. to Fri.
MELBOURNE W G (Spencer-street) <i>dep.</i> ...	A.M. 9 10	A.M. 9 13*	P.M. 12 25	P.M. 1 30	P.M. 1 30	P.M. ...	P.M. 4 23
North Melbourne ...	9 13*	*	12 28*	1 33*	1 33*	...	4 26
South Kensington ○ ...	*	*	*	*	*	...	*
Footscray ...	9 19	9 19	12 33	1 38*	1 38*	...	4 31
Middle Footscray ○ ...	*	*	*	*	*	...	*
West Footscray ...	*	*	*	*	*	...	*
Tottenham ○ ...	*	*	*	*	*	...	*
White City N C ...	*	*	*	*	*	...	*
Sunshine ES ...	9 28	9 28	12 43	1 45*	1 45*	...	4 42-94
Over Park ○ ES (see note, page 12)	9 34	9 34	12 50	1 50*	1 50*	...	4 50
Rail Mtr. Stop. Pl. No. 64 N C ...	...	...	Z	...	...	...	Z
Rockbank ○ ES { <i>arr.</i> ...	...	...-14	...-38	...	...	...	...
<i>dep.</i> ...	9 45	9 45	1 5	2 1††	1 58*	...	5 6
Rail Mtr. Stop. Pl. No. 65 ...	...	...	Z	...	...	...	Z
Melton ES ... { <i>arr.</i> ...	...	...	1 13-24	...	...	...	...
<i>dep.</i> ...	9 53	9 53	1 22 ●	2 9	2 5	...	5 17
Parwan ○ ES { <i>arr.</i> ...	...	...	...	...	...-38A	...	...
<i>dep.</i> ...	10 1‡	10 1‡	1 33 ●	2 18††	2 12*	...	5 29
<i>arr.</i> ...	...	...	1 40	...	...	...	5 37
Buechus Marsh ES W { <i>dep.</i> ...	...	...-8	...	2 25	2 19	...	...
Bank Box Loop ...	10 8	10 8	...	2 45*	2 39*	...	...
BALLAN ES W ...	10 28*	10 28*	...	3 2	2 56	...	...
Rail Mtr. Stop. Pl. No. 77 N C ...	10 45	10 45	...	...	...	...	...
Gordon ○ ES ...	10 55-4	10 55-4	...	3 12*	3 6*	...	...
Millbrook ...	...	...	...	*	*	...	...
Wallace ○ ...	11 3‡	11 3‡	...	*	*	...	...
Bungaree ES ... { <i>arr.</i> ...	...	...	...	...	...-83	...	...
<i>dep.</i> ...	11 8	11 8	...	3 20*	3 14*	...	...
Dunnstown ...	11 13	11 13	...	*	*	...	...
Warrenheip ES ...	10 35-8, 10	11 17*-38, 160	...	3 27*-111	3 21*-19	...	...
Rail Mtr. Stop. Pl. No. 73 ...	...	...	...	...	...	...	...
Ballararat East ○ ...	10 41	11 23	...	3 33*	3 27*	...	...
BALLARAT W G { <i>arr.</i> ...	10 45	11 32	...	3 35	3 30	...	...
<i>dep.</i> ...	...	11 47	...	3 50	3 45	4 30	...
North Ballarat Junct. ...	...	11 49*	...	3 52*	3 47*	4 32*	...
Wendouree N C ...	...	*	...	*	*	...	...
Linton Junction ES ...	...	11 53*-24	...	3 56*-138	3 51*	4 39A	...
Windermere ○ ES (See note, p. 12) { <i>dep.</i> ...	...	P.M. 12 0*	...	4 4	3 59	...	...
Burrumbeet ○ ES { <i>arr.</i> ...	...	...	...	...	...-82	...	...
<i>dep.</i> ...	12 3*	12 3*	...	4 9	4 4	To Linton	...
Travalla ○ ES { <i>arr.</i> ...	...	...	...	...	...	...	...
<i>dep.</i> ...	12 14F	12 14F	...	4 22	4 17	...	...
Beaufort ES W ...	12 20	12 20	...	4 30	4 25	...	...
Middle Creek ○ ES { <i>arr.</i> ...	...	...	...	4 43	4 38	...	...
<i>dep.</i> ...	12 33*-82	12 33*-82	...	4 54 ●-34	4 49 ●-34	...	...
Buangor ○ ES ...	12 38§	12 38§	...	5 1 ●	4 56 ●-43	...	...
ARARAT ES W { <i>arr.</i> ...	...	1 0	...	5 20	5 15	...	...
<i>dep.</i> ...	1 20-200	1 20-200	...	5 25	5 30	...	...
Continued on...	...	Page 18	...	Page 18	Page 18	...	...
	15	25	109	49	49	11	53

● No. 109 may depart Melton 1.14 p.m., Parwan 1.25 p.m. No. 49 Saturdays may depart Middle Creek 4.44 p.m., Buangor 4.51 p.m. No. 49 Monday to Friday, may depart Middle Creek 4.39 p.m., Buangor 4.46 p.m.

A. May stop, if required, to pick up or set down passengers at Linton Junction Signal Box. F. Stops definitely on Friday only.

Down

MELBOURNE-ARARAT-Goods Service—continued.

STATIONS		195 Eng. & Van Tues. to Sat.	15 Goods Mon.	37 Pilot Tue.	39 Pilot Mon.,Wed., Thur., Fri.	35 Goods Mon. to Fri.	17 Thro. Goods Sat.
MELBOURNE YARD	dep.	A.M. ...	A.M. 6 45	A.M. ...	A.M. ...	A.M. 9 35	A.M. ...
DYMON	...	...	...	...	...	...	...
South Kensington O	...	...	...	...	...	...	...
Marlborough River Junct.	...	...	Via	...	...	Via	...
Footscray	...	...	Goods	...	...	Goods	...
Middle Footscray O	...	...	Lines	...	...	Lines	...
West Footscray	...	...	...	...	...	...	...
Pottersham O	...	...	...	...	...	...	...
Pottersham Goods Yard W	...	...	...	...	...	...	...
Windsor ES	...	...	7 35	...	...	10 0	...
Amber Niding N C	...	...	...	...	...	...	...
Dore Park O ES	arr.	...	7 42—18	...	...	10 7	...
(See note page 12)	dep.	...	8 15—10	...	...	10 17	...
Hockbank O ES	arr.	...	8 34	...	...	10 34—8	...
...	dep.	...	8 55	...	...	11 10	...
Mulham ES	arr.	...	...	...	...	11 21	...
...	dep.	...	9 6	...	...	11 33	...
Parson O ES	arr.	...	9 18	...	...	11 48	...
...	dep.	9 10—wt14	9 18	...	...	11 58	...
...	arr.	9 16	9 24	...	...	P.M. 12 4	...
Hawthorn Marsh ES W	dep.	...	...	...	...	—160	...
Bank Box Loop	...	...	...	...	...	...	...
BALLAN ES W	dep.	...	...	...	...	...	...
Hudson O ES	arr.	11	...	...	...	...	...
...	dep.	Goods	...	...	...	...	...
Milbrook	...	Mon. †	...	...	...	...	...
Wallace O	...	A.M.	...	...	...	...	...
Hungary ES	arr.	...	...	...	...	...	...
...	dep.	From	7	...	...	173	...
Dunstown	...	Nth. G'long	Goods	...	...	Thro.	...
...	arr.	—106	Mon.	...	...	Goods	...
Warrnabul ES	dep.	8 48	(Thur. †)	...	...	Mon. to	11 57
...	arr.	8 54	...	...	...	Sat. †	P.M.
Bullarat East O	...	8 57	...	...	...	...	12 2
BALLARAT W G	dep.	...	A.M. 9 45	10 55	11 55	P.M. 12 5	12 4
Shell Oil Sdg. N C	...	...	...	...	...	...	...
Nth. Bullarat Junct.	...	...	9 48	10 58	11 58	12 8	...
White's Niding N C	...	...	...	...	...	...	...
Wendouree N C	...	...	...	...	...	...	...
Linton Junct. ES †	arr.	...	9 57	11 5	P.M. 12 5	12 18	...
...	dep.	...	...	...	...	...	...
Meath Stoneware Sdg. N C	...	...	...	...	...	...	...
Hudson N C	...	...	...	11 50	12 40	...	...
H.P. & Ampol Sdg. N C	...	...	...	...	...	...	...
Bullarat Cattle Sdg. N C †	...	...	...	...	...	...	...
Windsore O ES	arr.	...	...	...	...	12 31	...
(See note, page 12)	dep.	...	...	...	...	12 39	...
Harrumburk O ES	...	...	...	...	...	...	...
Yranulla O ES	arr.	...	...	...	...	1 2	...
(See note, page 12)	dep.	...	...	...	...	1 13	...
Hanaburk ES W	arr.	...	...	...	...	1 21—82	...
...	dep.	...	...	...	...	...	...
Middle Creek O ES	arr.	...	...	...	...	1 52—200	...
(See note, page 12)	dep.	...	...	...	...	...	...
...	arr.	...	...	...	...	Mon. to	...
...	dep.	...	...	...	...	Fri. †	2 0
...	arr.	...	...	...	...	2 0	2 44—138
...	dep.	...	...	...	...	2 37	3 24
ARARAT ES W	...	...	...	...	...	...	...
Continued on	...	...	...	...	...	...	...
		11	7	37	39	173	17

(W)

ARARAT-MELBOURNE-Goods Service—continued

Up

STATIONS	138 Fast Goods Sun. †	22 Thro. Goods Sat. †	22 Thro. Goods Mon. to Fri. †	56 Pilot Tue.	60 Pilot Mon., Wed. Thur., Fri.	94 Goods Mon. to Fri.	162 Pilot Tue.
	A.M.	P.M.	P.M.	P.M.	P.M.	P.M.	P.M.
ARARAT ES W ...	arr. 10 15	...	...	...	...	...	...
<i>dep.</i> 10 45	...	...	...	...	...	...	...
<i>Buangor</i> ○ ES ...	... 11 14	...	...	...	...	...	...
<i>Middle Creek</i> ○ ES ...	arr. ...	...	...	...	...	...	...
(See note, page 12)	<i>dep.</i> 11 20	...	...	...	...	...	...
<i>Beaufort</i> ES W ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 11 42	...	...	...	...	...	...	...
<i>Trawalla</i> ○ ES ...	arr. ...	...	...	...	...	...	...
(See note, page 12)	<i>dep.</i> 11 50	...	...	...	...	...	...
<i>Burrumbeet</i> ○ ES ...	arr. P.M.	...	...	...	...	...	...
<i>dep.</i> 12 7	...	...	...	...	...	...	...
<i>Windermere</i> ○ ES ...	arr. ...	...	...	...	...	...	...
(See note, page 12)	<i>dep.</i> 12 13	...	...	...	...	...	...
Ballarat Cattle Siding NC † ...	...	...	...	...	...	...	3 0
BP. & Ampol Siding NC ...	...	...	...	...	...	...	...
Redan NC ...	...	...	...	1 5	1 45	...	...
Martin Stoneware Siding NC ...	...	...	...	...	...	...	...
Linton Junction ES † ...	12 26	...	...	1 40	2 30	...	3 20
Wendouree NC ...	...	...	...	...	...	...	...
White's Siding NC ...	...	...	...	...	...	...	...
North Ballarat Junction ...	12 33	...	...	1 47	2 37	...	3 27
Shell Oil Siding NC ...	...	...	...	...	...	...	...
BALLARAT WG ...	arr. 12 36	...	...	1 50	2 40	...	3 30
<i>dep.</i> 12 38	...	1 30	1 30	...	...	...	...
<i>Ballarat East</i> ○ ...	... 12 41	1 33	1 35	...	...	...	...
Warrenheip ES ...	arr. ...	1 47	1 56	...	...	...	...
<i>dep.</i> 12 57	...	1 57	2 6	...	...	...	...
Dunnstown ES ...	...	...	...	...	...	...	...
Bungaree ES ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 1 10	...	...	...	...	...	...	...
<i>Wallace</i> ○ ...	...	...	...	...	...	...	...
<i>Millbrook</i> ...	...	...	...	...	...	...	...
Gordon ○ ES ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 1 26	...	...	...	...	...	...	...
BALLAN ES W ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 1 38	...	...	...	...	...	...	...
Bank Box Loop ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> ...	...	...	...	...	...	...	...
Bacchus Marsh ES W ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 2 10	...	...	...	...	...	...	...
<i>Parwan</i> ○ ES ...	arr. ...	...	...	...	...	2 35	...
<i>dep.</i> 2 16	...	...	...	...	...	2 46	...
Melton ES ...	arr. ...	...	...	...	...	3 6	...
<i>dep.</i> 2 26	...	...	...	...	...	3 18	...
<i>Rockbank</i> ○ ES ...	arr. 2 34-77	...	...	...	...	3 48-59	...
<i>dep.</i> 3 20	...	...	...	...	...	3 59	...
<i>Deer Park</i> ○ ES ...	...	...	...	...	...	4 14	...
(See note, page 12)	...	...	...	...	...	4 28	...
Ardeer Siding NC ...	...	...	...	...	...	...	...
Sunshine ES ...	arr. ...	...	...	...	...	...	...
<i>dep.</i> 3 45	...	...	...	...	...	...	...
Tottenham Goods Yard W ...	...	...	...	...	...	4 34-53	...
Tottenham ○ ...	...	...	...	...	...	...	...
West Footscray ...	...	...	...	...	...	...	...
Middle Footscray ○ ...	...	...	...	...	...	...	...
Tottenham ○ ...	...	...	...	...	...	...	...
Footscray ...	3 58	...	...	...	...	...	...
Maribyrnong River Junction ...	...	...	...	...	...	...	...
South Kensington ○ ...	4 3	...	...	...	...	...	...
North Melbourne ...	...	...	...	...	...	...	...
DYNON ...	...	...	...	...	...	...	...
MELBOURNE YARD ...	4 15	...	...	...	...	5 30	...
	138	22	22	56	60	94	162

NEW ZEALAND

Railway Tours

PRICE **1/8** TOURIST Excursion Tickets

AVAILABLE OVER ALL NEW ZEALAND GOVERNMENT RAILWAYS (PRIVATE COMPANIES' LINES NOT INCLUDED), WILL BE ISSUED AT ANY DATE, SUNDAYS EXCEPTED, BETWEEN THE

1st Nov 1889
and the
31st March 1890
AVAILABLE FOR
SIX WEEKS

FROM DATE OF ISSUE. THESE TICKETS MAY BE OBTAINED AT THE BOOKING OFFICES AT AUCKLAND, NAPIER, WELLINGTON, LYTTELTON, CHRISTCHURCH, PORT CHALMERS, DUNEDIN, INVERCARGILL, AND BLUFF RAILWAY STATIONS.

HOT LAKES DISTRICT.

EXCURSION RETURN TICKETS

Are issued throughout the year from Auckland to the Hot Lakes (name of recent volcano erupted) at the following rates, available for a month—
By train and coach to Okatauna (Auckland and Back), including coach fare,
First Class, £2 10s. 6d.; Second Class, £2 0s. 6d.

TE AROHA HOT SPRINGS.

Auckland to Te Aroha and Back by rail only
First Class return
10/6
Second Class return
8/6
(Available for one month.)
Second Trip Tickets, Auckland to Te Aroha by rail, Te Aroha to Thames by coach, Thames to Auckland by steamer, and vice versa, are issued at the following rates, available for one month—
12/6, 1st Class.
8/6, 2nd Class.

THROUGH EXCURSION

TICKETS for the Round Trip Auckland to Otago by rail; Otago to Christchurch, thence to Taranaki by coach; and Taranaki to Auckland by Matthews & Co. Company's steamer, or vice versa, are issued throughout the year. Available for one month. 3rd Class 4/6.

OKOROIRE HOT SPRINGS.

Throughout the year Tickets will be issued from Auckland to Otago and Back at the following cheap rates—
1st Class, 4/6; 2nd Class, 3/6. Available for one month.

HANMER HOT SPRINGS.

Cheap Through Tickets by rail to Christchurch, thence by coach to Hanmer Plains, can be obtained at Christchurch every Tuesday and Saturday, available for return for four weeks from date of issue—
Through Steam, Fare,
30s. First Class.

MOUNT COOK.

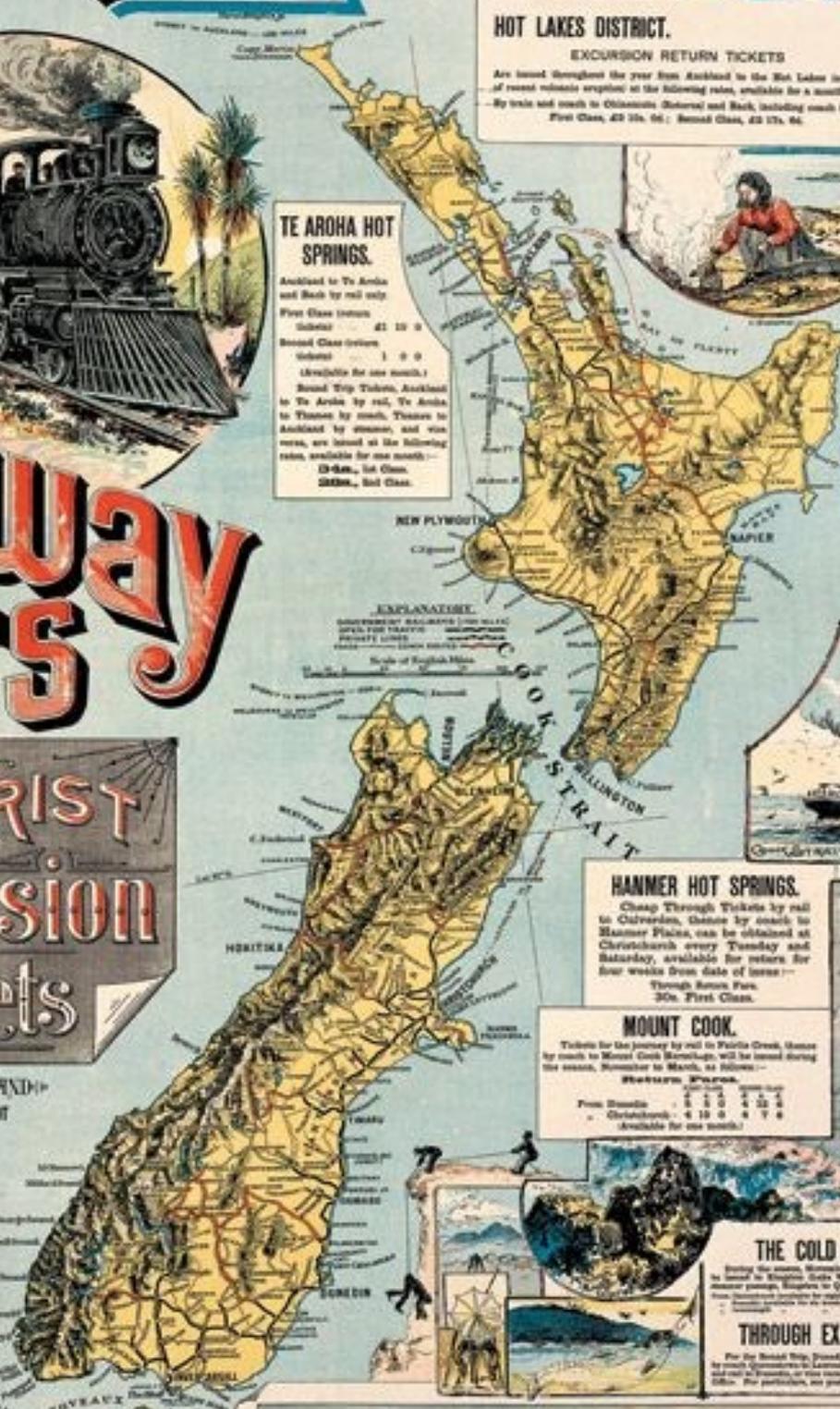
Tickets for the journey by rail to Fairlie Creek, thence by coach to Mount Cook Barrow, will be issued during the season, November to March, at following—
Return, Fare,
From Dunedin
Christchurch
Available for one month.

THE COLD LAKES DISTRICT.

During the season, November to March, Return Excursion Tickets will be issued to Stratford, Lake Waikarepa, and other lakes and include return from Stratford to Queenstown, Queenstown, and Back.

THROUGH EXCURSION TICKETS

For the Round Trip, Dunedin to Queenstown, by rail and steamer, thence by coach to Lakeside, and return, or Lakeside to Dunedin, or vice versa, are also obtainable at the following cheap rates. For particulars, see pages.



EXPLANATION.
GOVERNMENT RAILWAYS (see blue)
RAILWAYS FOR TRAVEL (see red)
PRIVATELY OWNED RAILWAYS (see green)
Scale of English Miles.

