

# When I Think Back...

by Neville Williams

## Radiovision: 'TV' of a kind for Melbourne — twenty-five years ahead of its time!

Some time back, a reader inquired as to who had been broadcasting Baird-style visual signals in Melbourne around 1930. The appropriate answer, it seems, was a company called 'Radiovision', headed up by a certain Donald Macdonald — who had been around the Australian wireless industry since the pioneering days of Father Shaw, Ernest Fisk and John Balsillie.

During the decade leading up to World War I in 1914, pressure had been building on the Australian Government to set up wireless communication facilities to increase the reach of the PMG Dept and the Royal Australian Navy, and to improve communication between the various Empire countries. Key technical figures at the time were Father Shaw with a wireless factory at Randwick, Sydney, and Ernest Fisk acting as the local representative of an unlikely duo: Marconi (England) and Telefunken (Germany).

Faced with having to make major policy decisions, the Government of the day had to rely on the advice of independent experts, who were few and far between at the time — one notable figure being Graham Balsillie.

A Queenslander, Balsillie had headed off to England in 1903 to study electrical engineering. While there, he devised a magnetic detector and joined a company erecting wireless telegraph stations in England and Russia. He later worked in Germany, Siberia and China, before returning to England, where he formed the British Radiotelegraph Company to market his own 'Balsillie' system of radiotelegraphy.

In London in 1911, Balsillie met the Australian Prime Minister Andrew Fisher, who invited him to return to Australia to supervise the planning and installation of a network of wireless

stations for their 'Communications Department' — the PMG.



**Fig.1: Born in 1883, Donald Macdonald's lifespan embraced the very earliest years of wireless/radio in Australia. He also oversaw the development of the early domestic superheterodyne radio receivers and anticipated the introduction of facsimile and television.**

By 1914, Telefunken and Balsillie radiotelegraphy stations had been erected for the PMG system at or near Port Moresby, Thursday Island, Cooktown, Townsville, Rock-

hampton, Brisbane, Sydney, Gabo Island, Melbourne, Hobart, Mt Gambier (SA), Adelaide, Esperance, Perth, Broome, Roebourne, Wyndham and Darwin; these plus King Island in Bass Strait were taken over from Father Shaw.

I must confess that John Balsillie's precise role in guiding the expansion of Australia's R/T services for the PMG was unknown to me, until brought to my notice by Ann Moyal's excellent book *Clear Across Australia* (published by Thomas Nelson Aust).

### Donald Macdonald

I must also confess that I had not previously encountered the name of Balsillie's wartime assistant, Donald Macdonald, around whom this article centres. I am indebted to his surviving — and youngest — son Robert for a copy of his curriculum vitae, as compiled in 1926.

Born at Ascot Vale, Victoria in January 1883, and after normal primary education, Donald Macdonald studied electrical engineering at the Melbourne Technical College from 1900 - 1903. This was followed by a couple of positions as an electrical mechanic in a small business environment, after which he established a modest business of his own majoring on X-ray work (1905 - 1907).

In the latter year, Macdonald joined the PMG Dept, working his way from an instrument fitter to engineer in the Telephone Department, Melbourne (1907 - 1912).

In 1912, he was regraded to Wireless Engineer, Central Staff PMG Melbourne (C'wealth of Aust.). From this position, in 1914, he became Officer Commanding Wireless, Western Pacific, responsible to the Administrator in Rabaul.

In this situation, Donald Macdonald was clearly complementing Balsillie's commission mentioned earlier — the more so when Macdonald was assigned to the Permanent Naval Forces as an engineer, with the rank of Lieutenant Commander. As such, he became officer in charge of all Naval Wireless in the Western Pacific. He resigned from the Navy around 1921, with a view to embarking on a private commercial career.

In the same period, Macdonald visited England and America, intent on pursuing the advances in technology in those countries, and especially the emergence of public broadcasting. He had ready access to American entrepreneurs and pioneers, including V.K. Zworykin, Jenkins, Alexanderson, Firth, Captain Ranger and Colby, plus key personnel in the film industry. Said his son: "In his contact with such prominent people, he wasn't short of things to talk about, himself!"

During the visit, he was able to negotiate the sale in the US of Balsillie's 'Flatlite' patents, and was invited to witness the trials of early radar navigation systems in New York Harbour in 1921. He also turned down an offer to join General Electric, preferring to pursue his career in his homeland.

In 1922, Macdonald set himself up in the Equitable Building in Collins Street, Melbourne as a Consulting Radio Engineer and, as such, spread his attention from telegraph stations in the Pacific to the new public broadcast stations which were being envisaged for Australia. So ends his own 1926 career summary, recovered from his personal papers.

## A generation gap!

In an aside, Robert Macdonald remarked to me rather sadly that he could only read about his father's career. Even in 1926, as the youngest child, he was 'still a kid' and not really able to appreciate much of what his 'dad' was on about.

He has since discovered that his father went to New Guinea with the ANMEF Contingent, to assume control of German wireless installations in the Pacific. He organised the commissioning of the station at Bitu Paka near Rabaul, and recommissioned the one at Nauru. Other stations were constructed at Woodlark Island and at the Headquarters in each district in PNG.

Telephone Gerrard 3341.

Watergate House,  
Adelphi,  
Strand, W.C.2.

7th December, 1920.

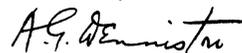
Dear Mr. Macdonald,

If convenient to you I should like to see you operate your machine on Thursday, December 9th, about 11 a.m.

I shall come with Lieutenant-Commander Travis and, if you have no objection, two engineer officers.

Will you please telephone me if this arrangement suits you.

Yours faithfully,



Head of Code and Cypher School.

Donald Macdonald, Esq.,  
Regent Palace Hotel,  
Glasshouse Street,  
W.1.

**Fig.2: Macdonald's cyphering machine, developed towards the end of WWI, was important enough to warrant personal inspection by Britain's top cypher expert. Macdonald later refused an offer of £10,000 from the Japanese Government.**

All told, and by the end of the 1930's, says Robert, his father had evidently been the engineer responsible for the construction of more than 40 wireless stations of one kind and another.

By contrast, early in his career, he had developed a cyphering machine which anticipated Germany's revolutionary 'Enigma' system by about six years. After each transmission, the cypher could be scrambled in a random manner, adding immensely to the difficulty of an eavesdropper breaking the code on any given occasion.

His research came to the attention of a Secret Service Unit involving codebreakers and cryptographers, under the control of the British Admiralty. Set up in Watergate House in Adelphi, the so-called GC&CS (Government Code & Cypher School) had become operative in 1919 under Alistair 'The Little Man' Denniston.

Within a couple of years, however, the group became answerable to the British Secret Service and the War Office rather than the Navy, with cryptography becoming a tool of international politics and diplomacy, rather than an instrument of war.

As noted in the letter reproduced

herewith, Donald Macdonald was invited to demonstrate his cyphering machine to Alistair Denniston in person. Nothing came of the matter, however, because the war was over, and Donald Macdonald was uncomfortable about the casual attitude of British and Australian diplomats to Japan. His own experience in the Pacific area had convinced him that Japan could pose an ultimate threat to Australia, next time around, and he was not prepared to support any action which might upgrade Japan's then relatively transparent cryptography.

Not surprisingly, when the Japanese Government offered him £10,000 for access to his cyphering machine in 1920, their approach was rejected. Says his son Robert: "The course of World War II might have been different, if Japan had installed an encryption system which the Allies were less able to decipher!"

## Broadcast stations

In the mid 1920's, as mentioned, Donald Macdonald turned his attention to public broadcasting, acting as a consulting engineer for Associated Radio (3AR Melbourne), Central Broadcasters (5CL Adelaide) and Tasmanian Broadcasters (7ZL Hobart) in 1926. His last in-

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involvement in this field was the construction of 3LK in 1937 and 7EX in 1938.

Amongst D.M.'s papers was the facsimile of a document which was sealed in a concrete capsule, forming part of an anchor for one of three cables supporting 3AR's 200ft mast. Erected on the Victory Estate, North Essendon, on land owned by the Associated Radio Company of Australia Ltd, the purpose of the station as stated in the document was 'the broadcasting of telephony news information, church services and music'.

The document was signed by the directors and others involved in setting up the station — including Donald Macdonald. It mentions, by the way, that the studios were being installed in Elizabeth Street, Melbourne, with a landline feed to the transmitter and with easy access to the City's principal churches and public buildings.

Macdonald's involvement with 7ZL was quite different. He had a sentimental link with Tasmania, in that he had supervised the installation of a communications transmitter and receiver in Hobart in 1912 to provide a link with the Mawson expeditions to the Antarctic.

Twenty or more years later, with the introduction of public broadcasting, he circulated a private letter to Tasmanian investors whom he judged might be interested. In it, he made the point that Sydney and Melbourne had each been

granted the right to two high-powered 'national' broadcasting stations, supported by listeners' licence fees. The smaller capitals were limited to one such station under current regulations, with Hobart's 7ZL being in a particularly parlous situation.

### Low power, low income

7ZL had been limited to an output power of 1/4-kilowatt and had to compete for about 800 licensed listeners, many of whom were attracted by mainland stations, anyway. Total revenue from all sources — licence fees and advertising — totalled only about £1200.

He had ascertained that the Government would authorise increased power to 3kW and this, with better studios and facilities, should boost the annual revenue to at least £6000.

Present management would consider favourably a takeover bid by a new company, compensated by a share deal, leaving sufficient capital to purchase and install high quality American equipment. The new company, Tasmanian Broadcasters Pty Ltd, would have mainly Tasmanian shareholders, would be based in Elizabeth Street, Hobart and would be under his supervision as Managing Director, responsible for both business and technical management.

However, while there is no reason to believe that Donald Macdonald was ever dismissive of his obligations to everyday radio technology, as above, there is little

doubt that he was more fascinated by the notion of transmitting *images* rather than sound from place to place by landline, cable and/or radio techniques.

It is evident, according to his son, that having met overseas inventors/pioneers during the early 1920's, his father had made a point of keeping in touch with them in later years, eagerly sharing their ideas and their enthusiasm for tomorrow's technology.

In September 1928, he circulated Vol.1 No.1 of a publication called *Radiovision*, on behalf of TRL (Television and Radio Laboratories Pty Ltd) of which he was Managing Director. Although described as a 'monthly journal', the photostats I have of Vol.1 comprise a single sheet folded to provide four pages, to be posted to the recipients. The intention was to change to a more ambitious format later, but this was never realised.

### What it was all about

The first issue carried an explanation of the title, 'Radiovision'. 'Television' dated back to the 1880's, it said, when vision-related signals were first conveyed by telephone line and described as 'television'.

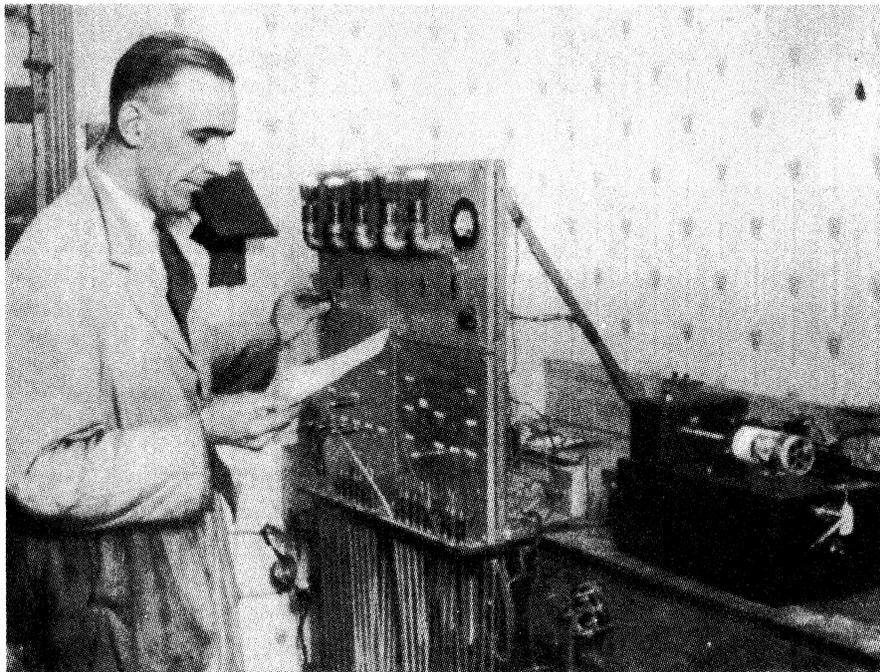
One of Macdonald's pioneer contacts, C. Francis Jenkins of Washington, had suggested that this terminology be adopted but that vision signals through space should henceforth be referred to as 'Radiovision'. So that became the title of TRL's journal, and in 1930 of the company itself.

Vol.1 No.2 (October 1928) carried an elementary explanation of 'Seeing by wireless', and listed eight stations in the USA that had been broadcasting experimental radiovision signals for up to six months. They varied in carrier frequency, picture rate and the number of lines, but details of the first station to air were as follows:

**3XK, Washington, D.C., Jenkins Laboratories, 46.7 metres, 6420kHz. Forty-eight lines per picture. Fifteen pictures per second. Monday, Wednesday and Friday, 8 to 9pm, Eastern Standard Time. Radiomovies.**

Vol.1 No.3 featured the text of a lecture by C. Francis Jenkins, whom it identified as 'the inventor of the motion picture projector', as well as a pioneer of Radiovision with achievements in that field dating back to 1913. At the time of the lecture, Jenkins' Radiovision station, as above, had been active for about six months.

A separate item in the same issue (Nov 1928) noted that the PMG had decided to set up a picturegram facility between Sydney and Canber-



**Fig.3: From EA December 1969, this picture shows Gil Miles operating transmitting equipment developed by Radiovision for what was effectively an early version of modern day fax.**

ra, to be extended later if commercially warranted.

In December 1928, the editorial highlighted — and ridiculed — a statement by the Director of Postal Services (Mr Brown) who had warned citizens against investing in companies promoting television or radiovision services. The editorial insisted that the publishers of *Radiovision* magazine were not cranks, but were merely following the lead of their American counterparts who had been featuring the new technology for the past six months.

## Pictures by radio

Two 'epochs in a new era' were announced in Vol.1 No.5 (January 1929), the first being that Television & Radio Laboratories Ltd had commenced experimental Radiovision transmissions through Melbourne radio station 3UZ a few days before, on January 10. It had also been announced in the press that station 3DB would be radiating test transmissions of the Baird system 'during next week'.

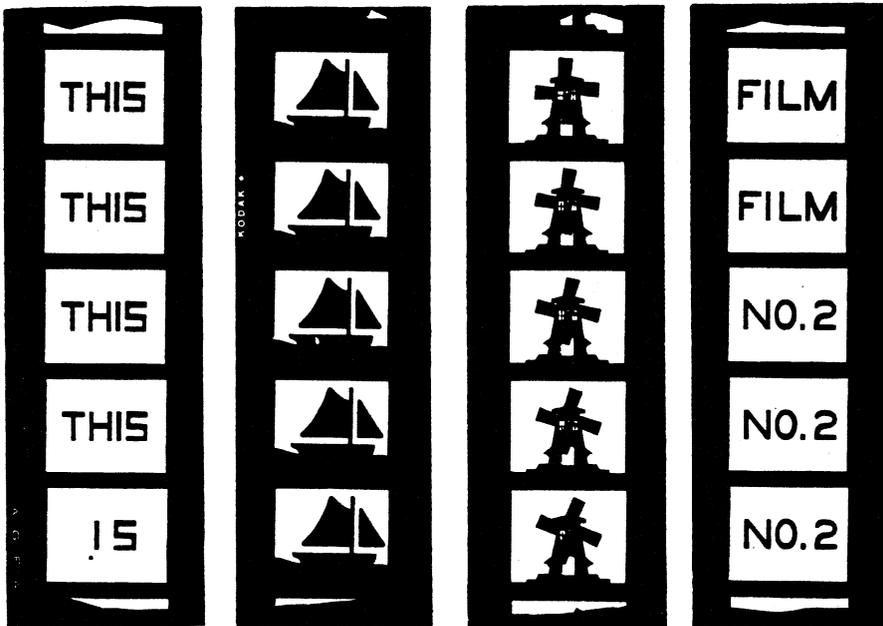
(At this point in time AWA had a nominal interest in picture transmission, as Australian representative of the European Fultograph system. According to a report by A.K. Box in *Popular Hobbies* (December 1, 1930, p.15) the two companies had merged their interest in the technology to achieve uniformity in broadcasts by 3UZ and 3DB in Melbourne, 2UE in Sydney and other unspecified interstate stations.)

Some of the images being transmitted by 3UZ were illustrated in the February 29 issue. To the question whether such images could be a source of enjoyment, the editor insisted that the real reward of radiovision was in appreciating how the images were produced, especially with the illusion of motion!

In different vein, the issue also announced that the PMG had accepted a tender from British General Electric for the supply of apparatus for the new Sydney-Melbourne picturegram link. T&R had missed out, on what they described as 'another progressive step in the march of radiovision!'

The following issue (March 1929) carried assurance that T&R Labs would be manufacturing neon lamps locally, in time for hobbyists to complete a radiovision receiver — for 3UZ, 3DB — 'before the long winter evenings are with us'.

It also mentioned that the committee responsible for the forthcoming radio exhibition had decided to exclude radiovision apparatus, lest it convey the impression to the public that the



**Fig.5: Radiovision shapes could be transformed into 'moving pictures' by using a moving model or by transferring the images to movie film as above. (See also EA for December 1969 and July 1972).**

service was much closer than was actually the case.

*Radiovision* for April 1929 challenged the Government to develop the technology for Australia, for its potential value during wartime. The May issue featured snips from films used to create moving images for the 3UZ transmissions.

## A super optimist

In the last but one of the issues of which I have a copy, August 1929, the Editor points out that, despite the contrary opinion of experts, public demand had replaced traditional 'silent' films with 'talkies' in cinemas during the past three years. A similar reaction could be expected once the public realised that it was now possible to add a picture to radio sound.

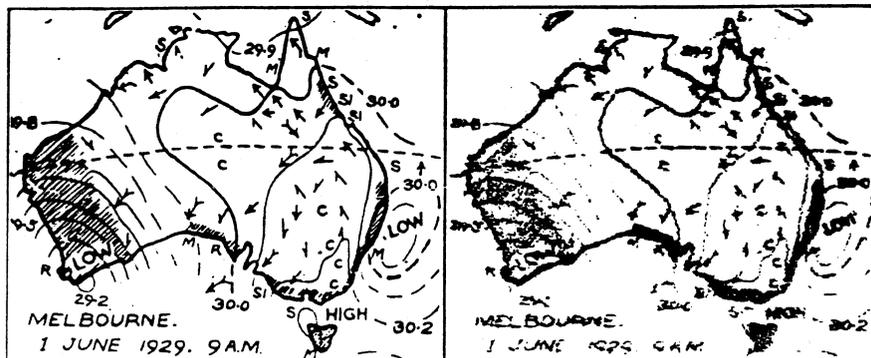
The writer conveniently ignored the fact that talkie sound technology was sufficiently advanced to complement

the picture, whereas continuous motion 'radiovision' technology was still in its infancy.

With hindsight, the *Radiovision* publication to hand reflects — to this writer — fifteen months of futile 'wishful thinking' on the part of T&R Ltd management.

The irony of the situation was that, about this very time T&R had assembled a team of capable engineers to head up their production of conventional receivers, comprising Howard Kingsley Love, Lay Cranch and Gil Miles. As recorded in Lay Cranch's biography (See *EA*, June 1994 p.41) they had developed an autodyne superhet of the very type which helped launch the 'golden age of radio'.

Equipped with just such receivers, countless thousands of families across Australia would gather round the radio each evening listening to plays, amateur



**Fig.7: An original weather map (left) and as received on TRL equipment from 3UZ (right). It would be useful to farmers, without any accompanying sound!**

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hours, quiz shows etc., drawing on their collective imagination to supply the visual aspect!

A quarter-century or more of developmental systems and a world war had to happen before the nations — including Australia — could settle down to the standards, equipment and conventions necessary to support radiovision — sorry, television — in every home.

It is apparent from Lay Cranch's biography that he believed Radiovision management to be headed in the wrong direction. Both he and Howard Love resigned, or were pushed — Cranch to 'rescue' a rival receiver manufacturer, Love to set up his own company. This was at a time of depression, when both would have been cautious about changing jobs!

(Gil Miles remained with TRL for some time, having been involved with the radiovision equipment — the kind of experimental work that intrigued him).

### Diversity of opinion

When I put it to Robert Macdonald that Love and Cranch could see where Radiovision was going astray, he tended to agree.

Yes, it did appear that his father had been an unduly influenced by pioneers like Jenkins and Baird, and genuinely believed that Australians should generate expertise — and patents — such that we would not be dependent on overseas when radiovision/television became a reality in the near future. ('Within a year' — *Radiovision*, October 1928.)

And, yes, there appeared to have been a diversity of opinion at management level about planning for this hypothetical future. Some contended that they should undertake conventional receiver production to provide funds to meet current needs!

### Troubled times

From 1930 onwards the picture becomes confused, with Donald Macdonald a controversial figure, according to his son Robert — often opposed by associates from whom he might have expected support.

In 1930 he experienced personal tragedy, in the loss of a sister in the then-current polio epidemic, and a son in 1931. Just ten years later he was to lose another son, shot down over Germany during a sortie by the RAAF.

While the public response to electrovisual technology fell short of Macdonald's expectations, his clippings

from the Victorian press indicate that the concept lingered on.

*Popular Hobbies* dated December 1, 1930 carried an article by 'AKB' — presumably A.K. 'Boxie' Box, whom I recall, amongst other things, as technical editor of *The Listener In* (see earlier reference).

Essentially, it repeated Macdonald's theme from the 'Radiovision' bulletins, stressing that the technology was simple but capable of elaboration, and that the present time slot for its introduction was 'fortuitous'.

In due course, stations would be able to transmit sound signals to accompany the pictures. In the meantime, diagrams like weather maps did not need a sound signal, and could be studied to advantage by farmers a whole day before they appeared in the morning papers.

Elsewhere in the issue was an article by Macdonald discussing the construction of an adaptor to convert signals from a normal radio receiver into a printout.

In September 1930, picture transmission grabbed the headlines again when an acceptable half-tone photograph broadcast by 3UZ was captured by a radio enthusiast in Ballarat and featured in the local paper *The Ballarat Courier*.

### A world record?

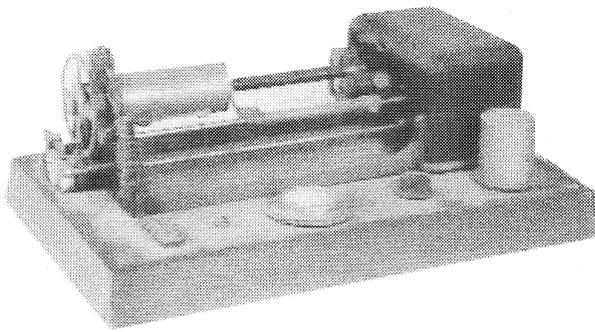
A few months later, in November 1931, a picture of the winning horse in the Melbourne Cup was telegraphed to newspapers in both Sydney and Brisbane, the latter representing what may well have been a world record for distance and transfer time.

The Lay Cranch biography, mentioned earlier, featured a newsworthy event in 1932, when another rider on another horse slashed the ribbon at the official opening of the Sydney Harbour Bridge.

To the public at large, such items tended to confuse the methodology and parties involved. But they entrenched the notion of seeing at a distance — by electrical means — with Macdonald and Radiovision at the epicentre.

So what happened to Radiovision (Australasia) Ltd? Early on, I put this question to Darryl Kasch of Maryborough in Queensland, who has been cataloguing Australian radio manufacturers. Said he: "I really don't know. They seem just to have disappeared!"

A month or so later, he forwarded me a lone photostat from *The Radio Retailer of Australia* for July 1932, indicating that Radiovision A/sia Ltd were planning to set up a distribution



**Fig.8: Designed in Melbourne for local sale or home construction, a RTL Labs facsimile receiver designed to be fed from a radio set in lieu of the loudspeaker.**

and service centre in Wingello House, Angel Place, Sydney. It would be managed by Don Knock.

Their receiver range was said to include a 4/5-valve metropolitan model, a 5/6-valve country model and an all-wave design, which might well have been the first of its kind on the local market. The receivers would be supplied complete or chassis only.

As I remember, Don Knock wrote his share of technical articles and was very active in the amateur ranks — but was not, to my knowledge a marketing man, likely to re-write Radiovision's fortunes.

So what happened to the company? In fact, I found the apparent answer in one of Donald Macdonald's clips, from *Smith's Weekly* for November 28, 1932.

Under the heading 'Will we soon be seeing things in our radio sets?' it says that Maguire Television Co Pty Ltd and Radiovision (A'Asia) Ltd had merged, to set up Teleradio Construction Pty Ltd (Inc. September 23, 1932), to take over the business of manufacturing and selling radio receivers from Radiovision's present address: Margaret Street, Richmond.

The very wording of the heading perpetuates the flawed notion of television as a kind of peep-show, supplementing an otherwise ordinary radio program. The article gives no information about the Maguire system, beyond the fact that it did not involve the use of a scanning disc.

In the Melbourne *Herald* (February 23, 1933) an abridged prospectus for the Radiovision partner stated that it now held priority rights to the Maguire system, adequately covered by Australian patents.

It was described as a compact cathode-ray system which produced an image on a fluorescent screen. Donald Macdonald's name appeared among the directors — minus any mention of a Managing Director.

A letter among his papers, signed by the Company Secretary, says that on May 9, 1934 his fellow directors had passed a motion recognising his dedicated service during a difficult period marked by a conflict of opinion, by limited funds, ill health and 'crushing family misfortune'.

A major shift in Macdonald's — and the Company's — concept of the subject was apparent in an article written by Macdonald on 'Television', in *Listener In* for May 19, 1934. It explained the principles of contemporary television based on cathode-ray technology developed by Dr Zworykin — another of his early contacts.

Donald Macdonald and the reconstituted Company were on the right track at last, although they could not have foreseen the intervention of WW2, the enormous scale on which television was to expand in its own right, the on-going hassles over international standards, and the ultimate dominance of the industry by manufacturers in Japan and South-East Asia.

Freed from his everyday commitments at Radiovision/Teleradio during the latter part of the decade, Donald Macdonald became involved in developing medical equipment, audiometers, colourimeters, recording oscilloscopes and X-ray equipment.

He also developed a system for photoelectric grading of dried fruit, to replace the cumbersome manual systems. A training studio was also set up for would-be radio performers, but it was not commercially successful.

Donald Macdonald died of a heart attack in 1946, while developing special techniques for the drop forging industry.

He was a multi-skilled electrical engineer from Australia's radio history, who thoroughly deserves a place in these pages. To his son Robert, who made this article possible — thank you! ❖