ISSUED EVERY — —
SECOND WEDNESDAY

SIXPENCE

RADIO

IN AUSTRALIA & NEW ZEALAND

Incorporating "Sea, Land and Air"

VOL. I, APRIL 4, 1923 No. 1

CONTENTS INCLUDE:

WIRELESS WORK ON R.M.S. "NIAGARA"

VALUE OF GOOD EARTH AND COUNTERPOISE IN TRANSMITTING

By C. D. MACLURCAN

WIRELESS CALL LETTERS

WHEN RADIO ENTERS THE HOME

Registered at G.P.O., Sydney, for transmission by post as a newspaper.

RADIO
IN AUSTRALIA & NEW ZEALAND
Interpreting Sea, Land and Air

Managing Editor: S. E. TATHAM Associate Editor: M. DIXON

CONTENTS

Volume I. APRIL 4, 1923 Number 1

	PAGE.
Radiotorial	3
Wireless Work on Board "G.B.E."	4
The Value of a Good Earth and Counterpoise in Transmitting	6
New Zealand Amateur's Record	8
The Experimenters' Corner	10
Radio Fun	11
In Radio Land	12
Club Notes and News	14
When Radio Enters the Home	16
Call Letters	18
The Link that Will Bind	20
The Deaf Hear	21
Obituary: Mr. L. L. Meredith	22
Queries Answered	24

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"Radio" Makes Its Bow

The publication of a new journal necessarily calls for a statement of policy. The publishers of "Radio" feel that Australian and New Zealand wireless engineers, operators and experimenters are entitled to know something about the aims and aspirations of this new paper, which now bids for their support. It is hardly necessary to emphasise that the cardinal point in our policy is the general advancement of radio in Australia and New Zealand. With that as our objective we feel confident of enlisting the enthusiastic support of the whole of the wireless fraternity in the wide area over which "Radio" will circulate.

The launching of this new journal is not a project that has been undertaken lightly. Careful enquiry has revealed the type of magazine required to meet the needs of the ever-growing army of those interested in wireless. It is our confident belief that at the very outset we can produce that magazine and keep on producing it. In giving this undertaking we are conscious of the fact that the standard of the readers amongst whom "Radio" will circulate is exceptionally high.

Australian and New Zealand amateurs have demonstrated on numerous occasions that the skill and enterprise required to achieve something of outstanding importance in the field of radio research and experiment is an important part in their make-up. To cater for the needs of these enterprising young men will be the constant aim of "Radio." We believe we can give them the articles and information they need, and which, up to the present, they have had to depend on getting from text books and overseas publications.

For the raw beginner—the experimenter, who is in his swaddling clothes—we have also a special message. It is our intention to feature simple technical articles which will enable him to climb, step by step, to the goal at which every experimenter aims.

Last, but not least, we recognise that in the near future thousands of homes in Australia and New Zealand will be equipped with receiving sets. The possessors of those sets will want to know how to derive the utmost pleasure and benefit from their ability to "listen in" to the musical items and other information broadcasted for their especial benefit. The new magazine will endeavour to render a service to these people which will ensure that "'Radio' will enter the home" in a double sense.

With this plain statement of policy, "Radio" makes its bow to the experimenters of Australia and New Zealand.

Radio Experimenting

The fear has been expressed in some quarters that, owing to the delay which has occurred in the commencement of broadcasting, many experimenters are in danger of losing their enthusiasm, and business is likely to become dull. Such an assertion can do no good, and is likely to do a great deal of harm, mainly because many experimenters are likely to accept it as an authentic statement regarding the position of radio in Australia.

It is beyond question that many experimenters embraced radio as a hobby chiefly because it appealed to them as something which provided interest, education and amusement not otherwise obtainable. These young men were naturally very enthusiastic at the outset, and felt that the goal of their ambition would be reached when they were able to "listen in" and hear Morse signals, music or speech. Because they were not able to do this immediately their optimistic outlook was in danger of becoming clouded. A moment's consideration will convince anyone interested in radio that the field for experiment is so limitless that after the first flush of disappointment at not being able to pick up broadcast music, etc., immediately has worn off those enthusiasts who have undertaken the hobby will settle down to work along lines which offer a fruitful field for experiment. There is so much to be learned about radio that no experimenter need feel disappointed at not being able to plunge into the joys of home receiving in the early days of his radio career. The goal to be aimed at is the complete mastery of the practical and theoretical sides of the science, and when the experimenter has advanced far along that road he will find himself well equipped to undertake the most intricate work into which ambition or circumstances may lead him.

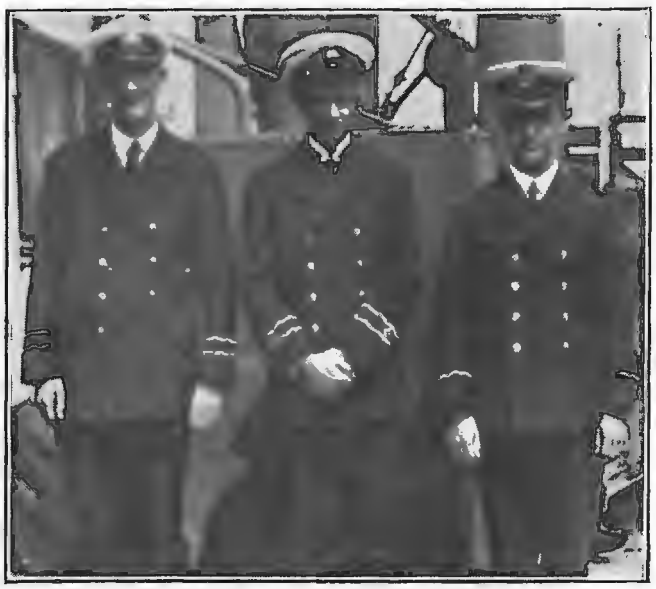
Wireless Work ON BOARD "GBE"

The Well-known Trans-Pacific Liner, "Niagara"

By S. E. TATHAM

PRACTICALLY every wireless operator and experimenter in Australia and New Zealand has at some time heard the call letters GBE speeding through the ether at 186,000 miles per second flashing messages to various coast and ship stations. Those three wireless call letters—GBE—belong to the Canadian-Australian Trans-Pacific R.M.S. *Niagara,* the flagship of the Union Steamship Company of N.Z., Ltd., and the biggest vessel plying between Australia and New Zealand and the West Coast of America.

As the *Niagara* is such a commodious ship and so well known and popular among the travelling public, we will get to the point and take a peep into the wireless telegraph office, located on the boat deck.

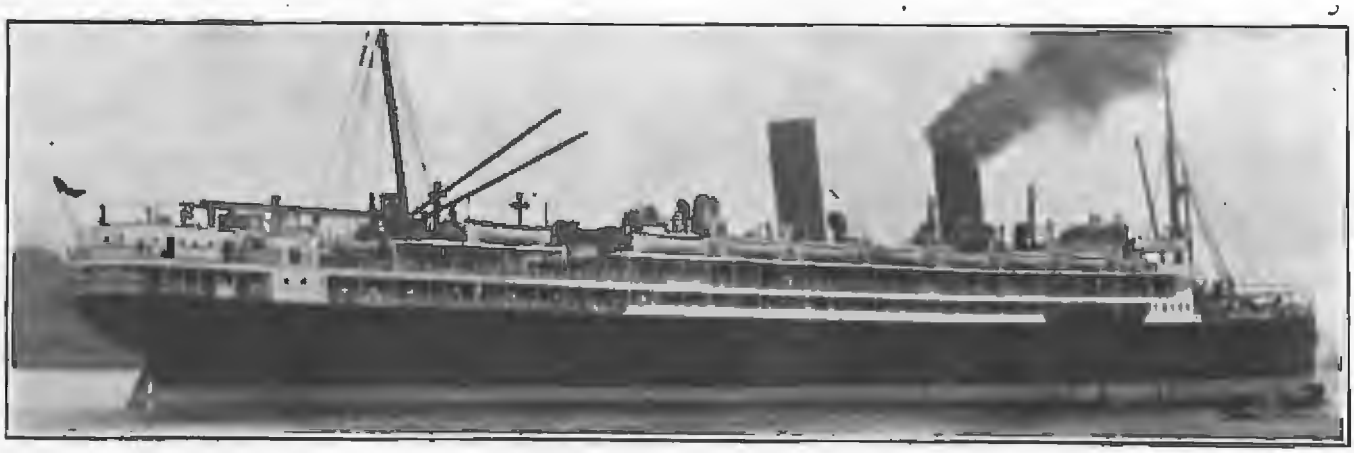


Wireless Operators on "Niagara."
Left to Right: Messrs. E. W. Coldwell (2nd), W. J. Martin (1st), and W. P. D'Arcy (3rd).

Here, from the time the *Niagara* leaves one wharf until arrival at the next, a continuous watch is maintained throughout. Visit the wireless office any time at sea, day or night, and one of the operators will be found on duty busy handling traffic. For this purpose three operators are carried, and at the time this was written Messrs. W. J. Martin, E. W. Coldwell and W. P. D'Arcy were the senior, second and third operators respectively on the *Niagara,* whose photographs are reproduced herewith.

The number of messages sent to and from the *Niagara* is really enormous, many thousands of words being handled each voyage. But handling between one and two hundred messages in twenty-four hours is all part of a day's work at GBE.

Obviously the wireless apparatus for such a station must be of the best type, and the *Niagara's* installation is maintained and operated by Amalgamated Wireless (A'asia), Ltd. The transmitter is a 2½ K.W. quenched spark set, and, in addition to this, there is an emergency set, which can be operated from a special battery of accumulators should the main power fail. The receiving apparatus is the most up-to-date in the world to-day, and is known as a "P1" panel type receiver, designed and manufactured in Australia by Amalgamated Wireless. This receiver has given excellent results, and will receive both



The Canadian-Australian R.M.S. "Niagara" leaving Sydney, N.S.W., for Vancouver, B.C., via New Zealand, Fiji and Honolulu.

wireless telegraph and telephone signals on wave-lengths up to 25,000 metres. Regularly every trip GBE *works* various stations direct at least 4,000 miles distant, and in many cases over 5,000 miles.

On board the *Niagara* all wireless messages for transmission are accepted at the enquiry office, and the ship is not far outside Sydney Heads when passengers commence sending farewell greetings to their friends ashore. Additional to "greetings," "au-revoir," "fine weather," "miss you very much," and all sorts of other cheer-up messages, many business men from all parts of the world who travel on the GBE continually utilise the wireless office for keeping in touch with their business on shore. Then messages pertaining to general ship's business are handled, these including advices regarding time of arrival, stores and water required, etc., etc.

Auckland (New Zealand) is the first port of call after Sydney, and the day prior to arrival GBE is sending and receiving all kinds of messsages to and from passengers and their Maoriland friends.

Immediately Auckland is left GBE commences to work the first tropical radio station on the run across the Pacific, situated at Suva (Fiji), call letters VPD. This station is well known by all operators and a number of experimenters in New Zealand and Australia, who have heard VPD working other islands and ships.

Simultaneously with VPD, the first American radio stations are heard working, Pago Pago, Samoa (NPU), Honolulu (KHK) coming into range on 600 metres wave-length. On long waves, between 10,000 and 25,000 metres, many stations are heard, including Manila, Philippine Islands (NPO), Pearl Harbour (NPM), San Francisco (NPG), Bolinas, Cal. (KET), Annapolis (NSS), Carnarvon, Wales (MUU), Saint Assise, France (UFT), and others too numerous to mention.

These stations can be regularly intercepted every day of the voyage between Australia, New Zealand, Fiji, Honolulu and Vancouver, and read quite comfortably. Wireless men generally will recognise the modernity and sensitivity of the P1 panel type receiver installed on the *Niagara* when it is stated that only one valve is used to receive the stations above mentioned.

After leaving Suva the run to Honolulu is commenced, and on 600 metres many more commercial stations are heard as the ship gets

A corner of the Wireless Office on the "Niagara," showing an operator at work receiving messages with the "P1" Panel Type Receiver.

further north. San Francisco (KPH), the well-known Radio Corporation's coast station and the Canadian Government coast station at Estevan, Vancouver Island (VAE) come within range, and passengers can send messages direct to Canada and the United States when still several thousand miles away.

After crossing the equator most of the Australian and New Zealand coastal and intercolonial ships are out of range, but then Canadian and American ships are heard, as well as broadcasting stations at Honolulu and the mainland of America; but very little time is given to listening to broadcasting on ships at sea, as the operators are generally too busy, and it is against rules to be off 600 metres wave-length for long, except as provided for in the international wireless regulations.

Throughout the voyage Press messages are copied from wireless stations in various parts of the world, and thus passengers are kept posted of world affairs every day. Shortly a daily newspaper will be published on the *Niagara* while at sea.

Between Honolulu and Vancouver, the last lap of the three weeks' voyage, traffic pours in. Passengers wireless for hotel accommodation, and those travelling overland make railway reservations, as well as advising their friends of their arrival, etc. So it can be readily understood that the operators on the GBE are kept busy.

In between watches the operators sleep and have plenty of recreation on deck, and join in the numerous shipboard games and dances held on the voyage. In port they are free most of the time, and after a stay of seven days in Vancouver the *Niagara* departs homeward bound to Australia, and then again for three weeks GBE is flashing messages to all points of the Pacific and to ships at sea.

The three operators are all experts at their work, and with the highly efficient transmitting and receiving apparatus installed are able to give passengers aboard the *Niagara* a speedy, reliable and accurate wireless service every day throughout the voyage.

It is by no means a stretch of imagination to say these men are kept busy at sea, and on the homeward voyage immediately Australian and New Zealand coast stations come within range they know Sydney is not far distant, where, on arrival, they will have a week's spell before commencing another run of over 7,000 miles across the Pacific.

The Value of a Good Earth AND Counterpoise in Transmitting

By CHAS. D. MACLURCAN
(Special to "Radio")

QUITE a number of experimenters in Australia now have transmitting licenses, and no doubt many more will obtain them in the near future, so that it will not be out of place to consider questions of efficiency in connection with the transmitting station.

The power allowed experimenters by the regulations varies according to the position of the amateur's station in relation to land stations, but, in the city area at any rate, it usually is from 10 to 25 watts input.

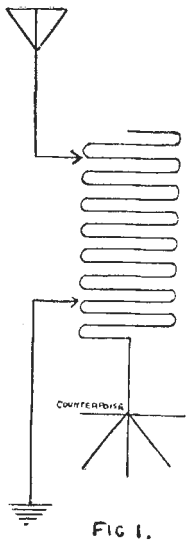


FIG 1.

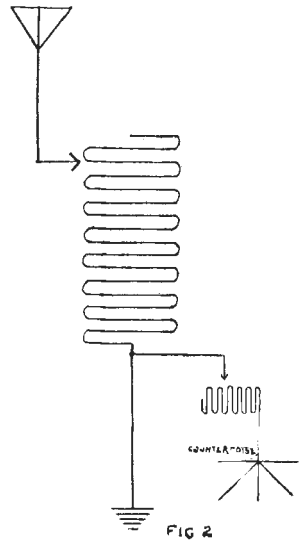


FIG 2

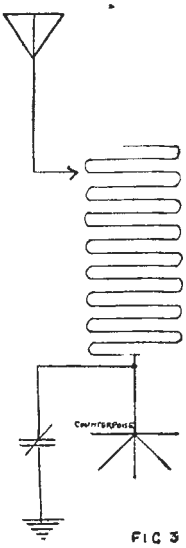


FIG 3

At first thought this may seem a ridiculously small amount of power, and a few years ago would have been considered hardly enough to send across the back yard, QRM permitting. But this power, low as it may seem, can be made to cover remarkable distances, provided the apparatus used is efficiently designed and constructed. *The writer has transmitted C.W. telegraphy over* 2,000 *miles on less than nine watts input power;* so there should be no difficulty in covering at least 500 miles at night with a properly designed 10-watt set.

Perhaps the most important part of the station to be considered is the aerial-earth system. Often it is a very difficult problem, because one is largely governed by the physical features of the property on which the aerial is to be erected. But whatever these features may be, three important points should be remembered when designing an aerial. Firstly, the ohmic resistance must be kept as low as possible; secondly, losses by absorption must be guarded against, and, thirdly, a good earthing system is essential.

Almost any type of aerial and earth connection will give good results for *receiving,* but it is quite another story when it comes to transmitting long distances with a minimum of power.

The best method of reducing the resistance losses in a transmiting aerial is to erect a counterpoise (or earth screen, as it is sometimes called) in addition to a good earth. But before going on to the discussion of this a few words about the earthing system will be helpful.

Most experimenters use the water pipe for their earth, and this answers very well. For transmitting, however, at least three separate leads, of not less than 7/20 copper wire, should be run and all soldered to the waterpipe. It will, of course, be necessary to *turn off the water* at the meter before attempting the soldering. One or two leads should be run by the shortest path to the nearest water pipe, and one should be taken to the street side of the water meter. This one obviously cannot be soldered, but it should be securely attached with a good pipe clip. The pipe should first be thoroughly cleaned with emery cloth, then several layers of heavy tin foil wrapped round, after which the clip may be tightly bedded down on to the pipe.

At the writer's station (2CM) the radiation with a certain small transmitting set was 1.3 amps., using one 7/20 earth wire. A second wire was

then run to the street side of the water meter and the radiation increased to 1.5 amps., an increase of 200 milli-amps. A third wire was then connected to the water pipe between the two former ones ,which resulted in a further increase of ten milli-amps. A fourth wire caused no further increase in radiation, so that it was reasonable to suppose that with three wires the resistance was reduced to a minimum.

Now when a counterpoise was erected, and correctly tuned to the transmitted wave length, the radiation was further raised to 1.9 amps. The resistance of the aerial without counterpoise was six ohms. With the counterpoise, only two ohms.

From these figures it will be seen how very important it is that resistance losses should be reduced as much as possible.

Dealing with the erection and method of tuning the counterpoise, it can be considered to be an intermediate aerial, suspended directly between the main aerial and earth. It should be a "shadow" of the main aerial, with the same number of wires extending a few feet beyond at either end, and be of greater width. Like any aerial, it must be thoroughly insulated, and the lead-in wires brought into the operating-room through a proper insulator.

The height above the ground varies under different conditions, but it should be high enough to allow one to walk freely underneath. Where a "T" aerial is used the counterpoise must also be a "T," and where the aerial is an "L" so also must be the counterpoise. As stated, it must be as like the aerial as possible.

Tuning the Counterpoise.

The capacity of the aerial to earth being greater than the capacity of the aerial to counterpoise, it is obvious that either inductance must be placed in series with the counterpoise or capacity placed in series with the earth lead to correctly tune the circuits in resonance. When the circuits are properly adjusted removing either the ground connection or the counterpoise connection will not change the antenna wave length, but will change the antenna resistance only.

First disconnect the counterpoise clip and tune the aerial and earth alone to the desired wave length. Then disconnect the earth clip and tune again to the same wave length, using the counterpoise only. When this is done both earth and counterpoise may be connected. Now watch the hot-wire ammeter burst its G string!

There are three methods of effecting this tuning. Figure 1 shows the easiest and least expensive way. First tune to the desired wave length with the aerial and counterpoise alone. Then try the ground clip on different turns until the point is found where the wave length is the same as with the counterpoise alone. The ground clip should be adjusted to within a half-turn on a large diameter helix. When the ground clip is at the neutral point the inductive impedence of the helix below the ground point tunes with the capacity impedence of the counterpoise, forming a series-tuned circuit of comparatively low resistance. The total antenna current divides between the earth and counterpoise inversely proportional to the effective resistances of the ground and counterpoise circuits.

Figure 2 shows another method, using a separate inductance in the counterpoise lead. This inductance may consist of 50 turns of No. 18 D.C.C. wire wound on a tube of 3½ inches diameter. A heavy spring slider, ebonite insulated throughout, provides a turn to turn adjustment. With this arrangement the aerial is first tuned to the desired wave length with the earth only connected. Then the counterpoise is joined up, and the slider on the inductance moved slowly from turn to turn until a point is reached that gives the maximum reading on the aerial hot-wire ammeter. The circuits are then in proper adjustment.

In Figure 3 a variable condenser is used in the earth lead. This condenser has to be capable of withstanding the full earth current, and is preferably a strongly-built one, with a fair spacing between the plates, immersed in oil. The capacity should be about .0015 micro-farad. The tuning is effected as in the last method, except that the aerial is first tuned to the desired wave length with the counterpoise alone.

The experimenter who follows the advice given in the foregoing will find himself amply repaid for the slight expense and trouble involved, besides having the satisfaction of knowing that he "has done things right."

New Zealand Amateur's Record

American Stations Received

Has Anyone Done Better?

EVERY radio experimenter in Australia and New Zealand will be intensely interested in the remarkable success achieved by Mr. R. Slade, of Waimataitai (N.Z.), in his effort to pick up American amateur stations.

Mr. Slade is one of the keenest experimenters in N.Z., and his most recent success is a call to amateurs in Australia to emulate what he has done.

Nothing serves to emphasise the progress made by radio experimenters in recent years more than the fact that countries like Australia and New Zealand, although separated from America by a wide expanse of ocean, can be brought into daily touch through the agency of the "magic spark." It is impossible to accurately describe the feelings of the "listener-in" who is able to decipher the call signs, indicating that his aerial has picked up such distant stations as Los Angeles, New York City, Fort Worth, Texas, San Francisco, Seattle, San Diego, etc.

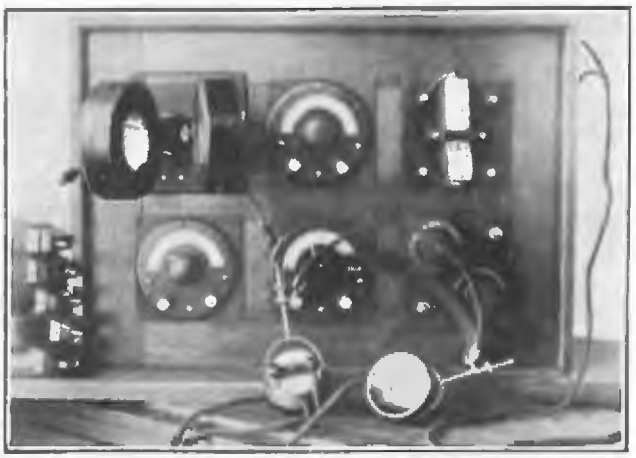
A station of high efficiency is necessarily required to accomplish such excellent reception, and every amateur cannot afford this at the beginning. The work carried out by those who can, however, indicates the high standard of efficiency of the radio experimenters in Australia and New Zealand, and acts as an inspiration to present and prospective enthusiasts to endeavour to excel their efforts. Any other experimenter who has achieved results similar to or better than Mr. Slade is invited to forward full particulars for publication in *Radio*.

A full list of call signs heard by Mr. Slade, together with the name of the station and the owner's address, is published hereunder.

The stations heard loudest by Mr. Slade are situated on the Pacific Coast of the United States, and following are particulars:—

Call.	Owner and Address of Station.
6KA	F. E. Nikirk, 1050 W. 89th St., Los Angeles, Cal.
6IF	L. J. Reidman, 1731 Atlantic Ave., Long Beach, Cal.
6JD	V. M. Bitz, 825 53rd St., Los Angeles, Cal.
5PX	E. Colston, Tipton, 200 Clark Ave., Fort Worth, Texas.
6AVR	C. Yates, R.F.D. No. 3, Box 104A, Fullerton, Cal.

Other stations also heard by Mr. Slade at various periods are:—



Mr. Slade's Receiver on which he intercepts signals from American Amateur Stations.

Call.	Owner and Address of Station.
1EL	Roger E. Bates, 184 Pine St., Wollaston, Massachusetts.
2FP	Harold Peiler, 321 E. 90th Street, New York City.
5GJ	John McCaal, 1021 Fairmount St., Anniston, Alabama.
5PB	James Greenwood, 9218 Main St., Houston, Texas.
5SF	H. Hendrix, 1616 Worth St., Fort Worth, Texas.
5XT	H. S. Richards, Radio Shop, 1911 Washin St., Oklahama City, Okla.
5XAJ	(No record).
5ZAK	(No record).
6EN	H. A. and E. C. Duvall, 4965 Wadsworth St., Los Angeles, Cal.
6KU	C. C. Brown, Volta Power House, Manton, Shasta Co., Cal.
6PD	J. J. McArdle, 263 Day St., San Francisco, Cal.
6ZI	(No record).
6ZZ	Harry L. Gooding, Douglas, Arizona
6GG	H. W. Larkin, 2487 Aytadina Ave., Pasadena, Cal.
6VM	P. Parsons, 633 Middlefield Rd., Pals Alto, Cal.
6BO	H. M. Preston, 514 Macdonald Ave., Richmond, Cal.
6TI	H. R. Greer, 414 Fairmount St., Oakland, Cal.
6JN	B. Brener, 1284 W. 67th St., Emeryville, Cal.
6BCR	C. Foreman, 1714 Alameda Ave., Alameda, Cal.
6XAD	Lawrence Mott, Avalon, Cal.
6AVD	J. R. Alsip, R.F.D. No. 3, Box 735, Watts, Cal.
6ANH	D. E. Chambers, 639 E. St., San Diego, Cal.
6AWP	E. Thacher, 407 W. First St., Santa Ana, Cal.
6ARB	C. Duncan, 3029 Baket St., San Fran., Cal.
6AJF	Frank E. Jones, 1822 Hearst Ave., Berkeley, Cal.
6BQC	(No record).
7SC	W. A. C. Hemrich, 503 Melrose Ave., Seattle, Wn.
7GS	Lyle Evans, 518 No. 79th St., Seattle, Wn.
7ZU	(No record).
7LR	Royal Howard, 425 Ellsworth St., Albany, Oreg.
8ZY	H. A. Deurk, Defiance, Ohio.
8BXX	Homer Forschner, 7 Ford St., Norwalk, Ohio.
8CEI	(No record).
9UU	Roy William Weisbach, 6784 So State St., Chicago, Ill.
9GK	C. and W. Quinn, 425 Sherry St., Neenah, Wisconish.
9LG	Darl F. Wood, 311 W. Exchange St., Jerseyville, Ill.
9VAJ	St. Claff College, Northfield, Minn.
9BED	Leslie B. Essington, 4412 Farlm Ave., St. Louis, Mo.
9AJP	Albert P. Upton, 2328 Taylor St., Minneapolis, Minn.
9CNS	(No record).
9AWM	Lloid V. Berkner, 117 E. Summitt St., Sleepy Eye, Minn.
9BSG	(No record).
9XAC	Karlowa Rds. Cpn., 611 Best Bldg., Rock Isld., Ill.
9ANS	Clarence A. Gunther, 320 40th St., Omaha, Neb.
9DPD	Marson H. French, 423 E. First St., Hutchinson, Kans.

9DGE—Harold Olson, 4217 S. Sheridan Ave., Minneapolis, Minn.
9CXP—(No record).
9AYU—Aubrey H. Williams, 1630 Adams St., Denver, Cal.
9CIP—(No record).

The illustrations accompanying this article show Mr. Slade's receiving apparatus, sketch of aerial arrangement, and diagram of circuit connections.

The situation of the station is on a hill about 200 feet above sea level and about half a mile from the sea.

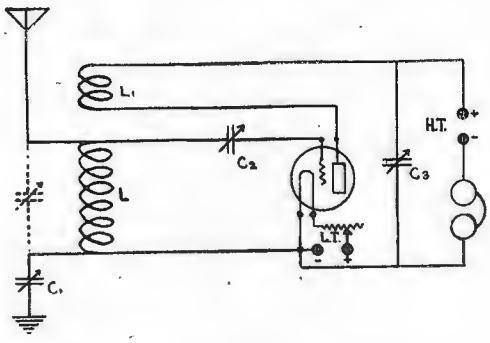
The aerial is of the inverted L type, and consists of three 16-gauge copper wires, 2ft. 6in. apart, 110ft. long, and leading-in wires 15ft. long. One end of the aerial is supported by a pole 40 ft. high, the other end being suspended from the top part of the house, 22 ft. high.

Earthing system consists of one lead to a water pipe and another lead to a washhouse copper, filled with ashes to retain the moisture, buried about 6 feet below the ground.

Diagram of connections is reproduced herewith, and it will be seen that the circuit is an ordinary regenerative, which with the new regulations is now prohibited in New Zealand.

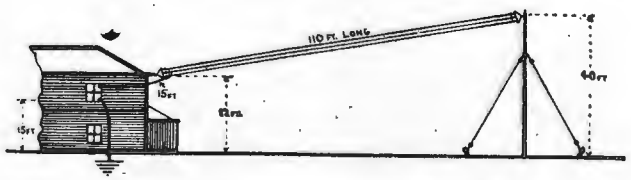
C1 is a variable condenser .001 mfd, C2 .0005 mfd., and C3 .001 mfd. All variation of tuning is done by the aerial tuning condenser C1 and C3 across phones and B battery, final adjustments being made by the filament resistance until CW signals come in with maximum strength.

The phones used are Brande's superior 2,000 ohms resistance, the B battery being made from accumulator



plates cut up and placed in test tubes 6 inches long and 1 inch diameter.

Several valves have been used, including Marconi ER, Mullard-Ora, Cunningham and V24. The Marconi ER and V24 bring in the signals loudest, but when using the V24 static is not so noticeable and only 20 volts are used on the plate.



Aerial Scheme used by Mr. Slade.

The tuning coils used are made up as follows: Primary consists of 20 turns of No. 20 D.C.C. wire wound on a thin cylindrical frame, 4¼ inches diameter. No taps are taken from this coil, tuning being effected by the condenser C1. No shellac is used, the wire being kept in place by silk thread. The tickler or reaction coil consists of 20 turns of 20 gauge D.C.C. wire, also on a cylindrical frame 4 inches in diameter, no taps or shallac being used with this coil either. The coupling between the two coils is always kept tight.

Mr. Slade states that he has used both Duo-Lateral and Giblin Remler coils, but he does not consider they are as good as the two coils he is using for short wave reception.

With the above described coils and the condenser C1 in series he is able to get American amateur stations on 200 metres anywhere between 10° and 110° on the 180° condenser coil.

Vernier condenser or lever attachment on the tuning condensers is necessary, as the stations have exceptionally sharp tuning, the capacity of the hand cutting them right out altogether.

Mr. Slade intercepts the American amateur stations as early as 6.30 p.m. New Zealand Mean Time, and as late as 12.30 a.m.

WHEN USING A LOUD SPEAKER

Never use more amplification than is necessary.

Remember that clearness is as important as volume.

An operator should not force the loud speaker to the limit.

Overloading the plates of the amplifier tubes is unnecessary.

Keep the tube and socket contacts free from dirt and dust.

Do not expect the loud speaker to do the work of a one-step amplifier.

Simple Method OF Constructing Grid-Leaks

By F. C. SWINBURNE

THE method of construction herein described will be of interest to experimenters generally, and in cases where the value of the grid-leak must be finely adjusted this method is exceptionally valuable. The materials necessary are a piece of ebonite or some other similar insulating material approximately 1½ inches long and ½ inch wide, the thickness not being very important, two machine screws and half a dozen nuts to suit same. The screws should be long enough to pass through the ebonite and leave about half an inch projecting.

Two holes should be drilled through the ebonite, about 1 inch apart and as near the centre as possible, so as to give a neat appearance to the finished article. Then insert the screws in the holes so the heads are both on the same side of the ebonite, and clamp in position with a nut on each. The remaining nuts are used two on each screw for making the connections.

The grid-leak may now be connected to the circuit by a pair of fairly long leads, so that it may be conveniently moved about for adjusting. After the set has been tuned and signals are coming in as strong as possible the grid-leak should be held over the flame of a lighted candle or wax match so that a film of soot (carbon) is deposited on the surface of the ebonite and the heads of the screws. As this process is continued the signal strength will increase up to a certain maximum, and then decrease again; should no increase of signal strength take place, however, the experiments should be stopped, as it is obvious that a grid-leak is of no advantage to the circuit under test.

When carbonising the ebonite do not hold it too long in the flame at one time, as the ebonite is liable to become soft and lose its shape if it becomes too hot, and, in addition, the surface is liable to burn and become rough, thus spoiling the appearance, and the smell of burning ebonite is decidedly unpleasant. The grid-leak should be moved about all the time it is in the flame so that the carbon is evenly deposited on the surface. Do not hold the leak too low down in the flame as a small amount of grease is liable to be deposited with the carbon, and this makes the next process difficult. Should the value of the leak be made too low some of the carbon may be rubbed off, and the process repeated until the desired value is obtained. The correct value should not be judged while the leak is hot or in the flame, as the flame itself may act as a resistance in parallel with the deposited carbon, and, further, the resistance of the carbon at high temperatures is considerably higher than at room temperature.

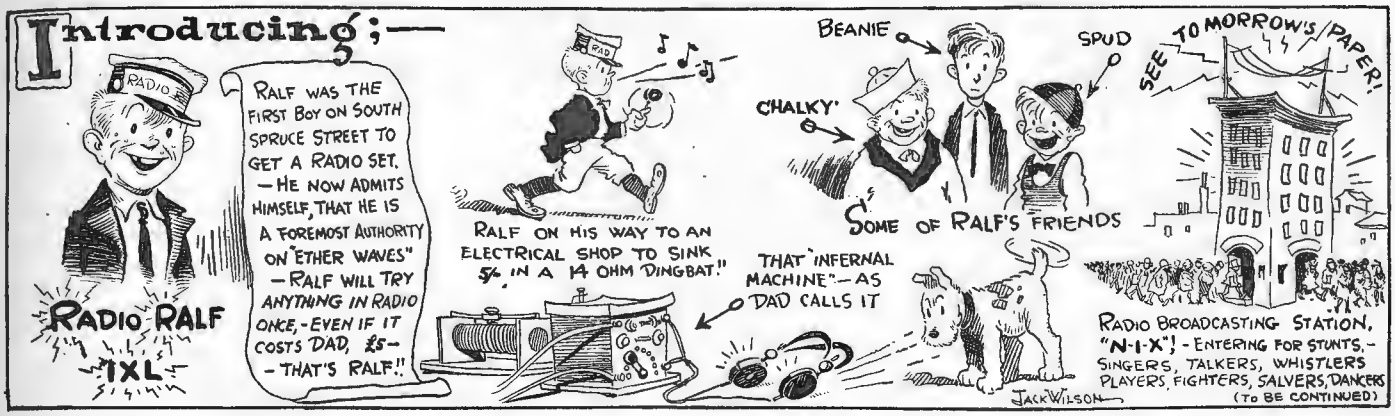
Grid leaks constructed as described above are highly efficient, and the effects noted during their construction are sufficiently interesting to well repay one for the trouble involved, but as permanent parts of a set they posses one failing common to all similar resistances when exposed to the air—they vary slightly with atmospheric conditions. In order to overcome the above defect the following procedure can be adopted with absolute success. After the grid-leak has been carefully adjusted to the correct value gently dip it into a jar containing celluloid film cement (used for the repair of cinematograph films), and then allow to dry, as it will do in a few minutes. The dipping should then be repeated until a fairly thick coating of celluloid has been deposited all over the grid-leak. Care should be taken that the leak is not moved about more than is necessary to insure that it is properly wet all over when immersed in the cement, as otherwise some of the carbon may be washed off, thus altering the value.

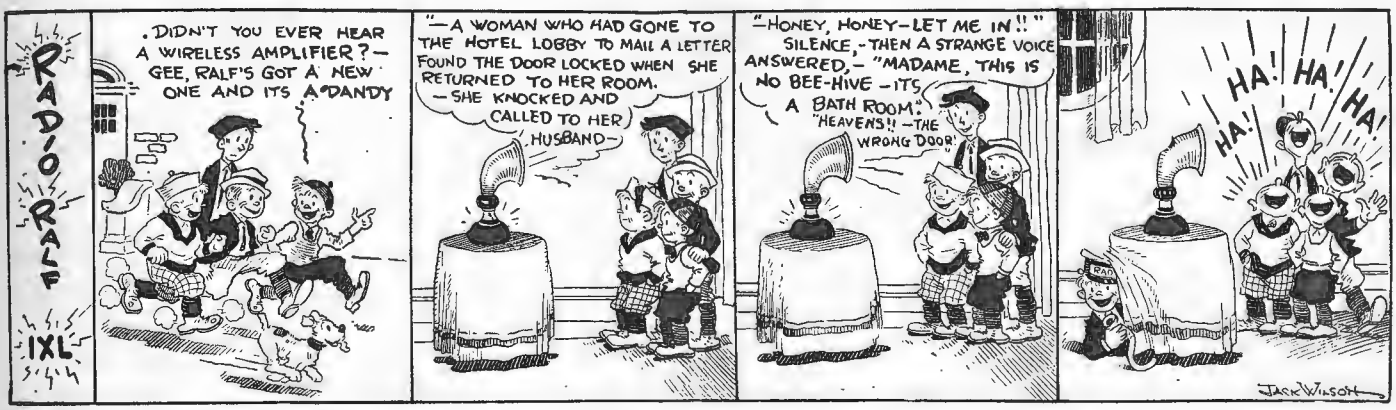
Radiofun

At considerable expense we have made exclusive arrangements for the regular publication of "Radio Ralf's" adventures, which will be one of our regular features. Hereunder we introduce "Ralf," and in subsequent issues of "Radio" his many thrilling experiences will be recorded, which we believe our readers will enjoy.—Ed.

RADIO RALF

BY JACK WILSON.





THEN HE TOOK UP RADIO

"Can you explain radio to me?"

"To be sure. Take heterodyne action. Suppose that the frequency of oscillations in the receiving antenna is 100,000 cycles per second when that circuit is in resonance with passing electro-magnetic waves, it would require a generator of undamped waves possessing a frequency of 101,000 cycles per second to be heard."

"I understand perfectly now."

In Radio Land

Home Study by Radio.

THE Americans have hit on the brilliant idea of broadcasting college and university extension courses by radio. In an announcement to the effect that plans are being formulated to give an efficient service to those desirous of studying at home, it is stated that "in radio education has found a new and powerful ally."

England and Germany are planning to broadcast similar courses, and several prominent institutions of learning in the United States have already made a beginning in that direction. Perhaps the time is not far distant when would-be students in outback Australia will be able to enjoy the advantages of college education by the aid of radio.

Catching Crooks by Wireless.

Melbourne may well pride itself on being up to date in its method of catching crooks. The task of equipping the police patrol car with a radio set to pick up messages when patrolling the city presented many diffculties at the outset, but they were successfully overcome. Imagine the cold shiver which now runs down the spine of the most experienced burglar when he realises that at any moment his operations may be detected by a passer-by and the patrol car come sweeping along in response to a wireless call from police headquarters.

An opportunity of showing how quickly a radio call could be responded to occurred in Melbourne recently. The patrol car was summoned to a shooting affray, and arrived there within six minutes of the call being transmitted.

The aerial for receiving the communications is fixed under the hood of the car, and so well does it perform its work that the instructions are clearly heard, not only by the constable with the receivers against his ears, but also by the other occupants of the vehicle. To eliminate transmission errors as much as possible, messages are repeated several times. It is highly probable that the Sydney police will be similarly equipped in the near future.

Radio Defies Storms.

The average person scarcely believes that the violent storms which from time to time sweep over the ocean, and leave death and destruction in their wake, are powerlesss to interfere with the radio messages flashed from ship to ship, and ship to shore. Ample evidence has, however, been adduced in recent months to prove that such is the case.

At the beginning of the year a succession of heavy storms, declared to be the worst for twenty years, swept over the North Atlantic and played havoc with shipping time-tables. All vessels were from one to seven days late in making port on both sides of the ocean. Throughout the whole time radio remained triumphant over the elements, and messages passed between ship and shore stations with unbroken regularity. The needless suspense and suffering which was thus obviated is beyond calculation, in addition to which it removes any doubt as to the practicability of transmitting radio messages while the atmosphere is disturbed by storms.

Medical Advice by Radio.

The chief officer of the steamer *Era* probably owes his life to radio. Quite recently, when two days out on the five days' trip from Hobart to Port Pirie, he became seriously ill, and the wireless officer was deputed to describe his symptoms to, and obtain advice from, the Melbourne Hospital. Within three minutes of the first message being transmitted the Melbourne Radio Station had flashed back a prescription, which was dispensed from the ship's medicine chest. Thanks to this mixture, the officer soon recovered, and is now an even more enthusiastic advocate of the all-round utility of radio than ever before.

A Power Plant in a Suit Case.

Tests recently conducted at the Rocky Point Station of the Radio Corporation of America prove that the new high-power vacuum tubes are superior to the cumbersome and expensive high-frequency alternators now in use for transoceanic radio communication. A special test set that employed six of the new General Electric Company 20 K.W. tubes, was recently put into transatlantic service without notifying either the sending operators or the receiving operators on the other side of the world. Neither the foreign operators nor the Americans noticed any difference in the signals, so it is assumed that the signal strength was comparable with the alternator signal, although the antenna current with the tubes was only a little over half that produced by the alternators.

This is a remarkable achievement, particularly when it is borne in mind that the alternators take up almost the centre floor space of the huge Rocky Point plant, whereas the tubes which accomplished the same results could almost be put in an ordinary suitcase.

New Japanese Radio Net.

Application for sanction from the Japanese Government to establish a wireless telephone system has been

made by the Daido Electric Power Co. of Nagoya, Japan, according to advices received by the United States Department of Commerce. The company propose to operate this wireless system primarily for its own convenience in communicating with the various stations of its electric light and power system, but its use may be extended eventually to the general public if sufficient demand should arise.

As at present planned, the first wireless station will be built at Okuwa, in Nagano Prefecture, on the Central Japan railway line, from which point communication will be established through Nagoya and as far as Osaka, a distance of over 150 miles.

World's Largest Radio Horn.

Idora Park, a public amusement resort in California, U.S.A., now boasts possession of the world's largest radio horn. Measuring thirty-five feet in length, with an opening twelve feet square, this horn was recently installed for broadcasting music received by radio, and is in successful daily operation at the present time.

Equipped with a Magnavox radio reproducer and power amplifier, the broadcasting capacity of this gigantic instrument is sufficient to carry radio music, without "distortion," throughout an area of approximately twenty-nine square miles. One thousand feet of clear aeroplane spruce lumber went into its construction, which incidentally presented a number of interesting problems to the Magnavox engineers by whom it was designed and built.

This spectacular "stunt" on the part of an enterprising amusement resort, offers a basic idea which is capable of really impressive development. It is a further indication of the far-reaching influence of radio on the world's work and play which warrants attention.

High-Speed Wireless Service Between Swiss and English.

A new high-speed commercial wireless service between Switzerland and England is being carried on by stations which have been specially erected for the purpose by the Marconi Company in Switzerland and England, capable of handling traffic at a speed of 100 words a minute in each direction.

The signals received at the English end are automatically relayed to London, and there recorded in Roman characters. The English transmitting station is automatically operated from Radio House, Finsbury, London.

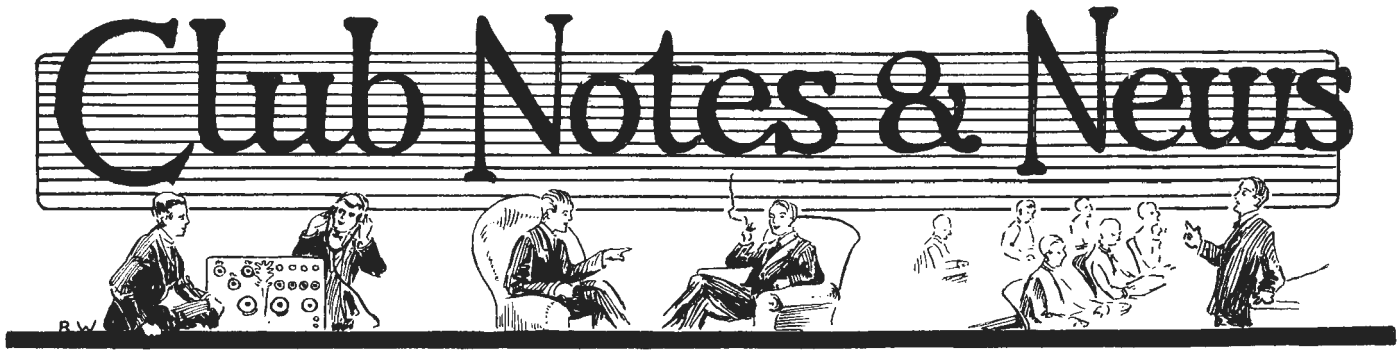
The usual telegraphic rates apply to this new service, and messages intended for transmission by this route are accepted at all post-offices.

Radio Urges Hens to Lay More Eggs.

Chickens like radio music, and owners of the birds would be more than repaid by installing radio outfits.

This is the contention of Jacob J. Irvine, of Winlock, Washington, U.S.A. He experimented along these lines on his farm.

Mr. Irvine installed a radio set in his chicken house, which shelters 6,000 hens. A survey revealed that the number of eggs laid had increased on an average from 58 to 78 from every 100 chickens.



Wireless Institute of Australia

NEW SOUTH WALES DIVISION.

THE Annual Dinner of this Division was held at the Pekin Café, Sydney, on Tuesday evening, March 20, and a most convivial time was spent. Owing to pressure of business, the President (Mr. C. P. Bartholomew) was unable to attend, so Mr. F. Basil Cooke (Vice-President) was Chairman for the evening.

A most excellent menu was arranged by the Council, each course being appropriately coupled with radio terms and members names. It is reprinted hereunder:

MENU:

Oscillating Olives
Souperegenerative Soup, with Grid Leeks
Crocker Dial Soup
Single Slide Oysters
Knob and Dial Pie
Flat Top Beef
Perried Rice
Mingayed Marrow Stowed Sauce
Cooked Carrots Unearthed Potatoes
Broadcasted Beans
Tickler Tarts
Eddy Currents
Aerial Waters for small capacities
Quenching Beer for larger capacities
(50 farads and upwards)
Singing Spark Cigarettes

The toasts of the evening were:

The King.

The Institute (proposed by Mr. S. E. Tatham, responded by Mr. F. Basil Cooke).

The Visitors (proposed by Mr. P. Renshaw, responded by Messrs. W. T. Crawford, W. M. Maclardy, R. Steane and S. E. Tatham).

When proposing the toast of "The Institute" Mr. Tatham briefly outlined the progress of amateur wireless in Australia during the past twelve months, and instanced the many changes that had taken place "Last year," said Mr. Tatham, "there were only about three experimental wireless bodies in Sydney, but to-day there is, in addition to several city clubs. a club in practically every one of the leading suburbs around Sydney, as well as other States. Where last year there were only two or three firms retailing experimental wireless apparatus, at the present time there are at least twenty firms handling goods for wireless enthusiasts. I think," continued Mr. Tatham, "that that is evidence of the great progress amateur wireless has made since your last Annual Dinner, and I hope that the progress will be such during the ensuing year that at your next Annual Dinner your membership will have increased to such proportions that you will have six tables instead of one."

Mr. Tatham then told the gathering of his impressions of wireless work generally in Canada and the United States of America gained during a recent business trip. He described a visit to the high-power trans-ocean wireless stations of the Radio Corporation of America that communicate direct from San Francisco to Honolulu and Japan. At each point there are two stations, one for receiving and one for transmitting, the former being situated 40 miles and the latter 65 miles from San Francisco, the distance between the two being approximately 45 miles. These stations are operated direct from the heart of San Francisco by means of a long distance control, and so heavy is the traffic handled that they work duplex practically all the time. As for broadcasting this was a great innovation in practically every home in America, and although there was great confusion "in the air" some time ago the various broadcasters had got together, and now all stations work to a schedule. "In Los Angeles," said Mr. Tatham, "quite recently several of the leading broadcasting stations joined forces, scrapped their stations, and built one big station, and

since this has been operating there has been a marked improvement in the service and much "jamming" has been eliminated." Great work is done by members of the American Radio Relay League, he stated, and some of the members have magnificent stations.

Mr. Basil Cooke in responding cordially thanked Mr. Tatham for the American radio information he had given members, also for his good wishes for the Institute's welfare. Mr. Cooke, too, hoped that the coming year would be a prosperous one for the Institute, and desired to see a much bigger gathering at the next Annual Dinner.

Mr. Renshaw, in proposing the toast of "The Visitors" (Messrs. Crawford, Tatham, Maclardy and Steane) very heartily welcomed them as the Institute's guests, and then outlined the work of the Institute during the preceding year. Mr. Renshaw said: "I wish to impress upon our visitors that the Institute is not, as has been stated in some quarters, connected, governed or influenced by any party, parties, company or organisation. The Institute is governed by its own council, and its aim is to further the interests of wireless experimenters." In conclusion, Mr. Renshaw said he hoped that the visitors would be with them again next year.

In responding to the toast of "The Visitors," Mr. W. T. Crawford (Government Radio Inspector) thanked Mr. Renshaw for the hearty welcome extended. He then explained the matter of honorary radio inspectors being appointed to assist in having the regulations complied with, and brought to members' attention the number of unlicensed stations there must be, and also the number of licensed stations that are breaking the regulations. A lot of experimenters are using valves and allowing them to "howl," thus causing interference with other stations. Mr. Crawford also pointed out that experimental wave lengths should be kept down to 425 metres, as above that they are liable to interfere with commercial work on 450 metres.

In conclusion, he stated that wireless experimenters are a great asset to Australia. and in the course of his duty in examining amateurs for valve licenses he found that their knowledge of wireless and telegraphic speed was very good; in fact, far above expectations.

Mr. W. M. Maclardy (*Wireless Weekly*) also responded, and fully agreed with Mr. Crawford's remarks regarding experimenters observing regulations. Mr. Maclardy also stressed unity of experimenters, and considered that they would achieve far more abiding by regulations and working collectively than proceeding haphazardly individually.

Mr. Steane, a visitor from the Victorian Division, also responded. and stated that very good results were being achieved with honorary radio inspectors in Melbourne.

Mr. Malcom Perry, in the course of a speech, welcomed back to the Institute one of its oldest members and a former president, Mr. Spencer Nolan. Mr. Perry said he remembered back in the old days when Mr. Nolan had a 6-inch spark coil and a rotary spark gap operated by water power, which was considered to be both a unique and an efficient arrangement in those days.

The first thing Mr. Nolan did when responding was to correct Mr. Perry by saying: "It was not a 6-inch coil I had, but a 12-inch." (Laughter.) He then said he was pleased to be among the Institute members once again, and hoped to see them more frequently in the future.

The pleasant evening concluded with everybody joining hands and singing "Auld Lang Syne."

SOUTH AUSTRALIAN DIVISION.

The March meeting of the above Society was held at the University of Adelaide on Wednesday, March 7.

The President (Mr. Hambly Clarke) mentioned the recent visit of the Radio Inspector (Mr. Martin), who emphasised the fact that no circuit capable of energizing the aerial was permissable under the existing regulations. In his remarks Mr. Clarke mentioned that interference to local telephony sometimes occurs. Some very fine programmes are presented which are often marred by oscillating valves. Fortunately, however, this trouble seems to be cut down to a very appreciable extent now.

Mr. Bland supplemented the President's remarks by exhibiting and explaining circuits that comply with the above rule. He drew a number of practical circuits utilising one or two valves which have been proved to be of exceptional merit.

Mr. R. B. Caldwell then described and exhibited an easy method of receiving from the A.C. lighting mains. By means of an ordinary adaptor and a length of flex it is possible to couple an ordinary receiving set, without any further apparatus, direct to the mains and obtain excellent results with both crystal and valves.

A general discussion followed the lectures.

A special committee have been appointed to secure a suitable room, where it is hoped to instal the transmitting and receiving sets, and also carry out the construction of apparatus. practical demonstrations, etc.

MARRICKVILLE RADIO CLUB COMMITTEE.

Back: Mr. McQuoid (Committee), Mr. Edwards (Treasurer), Mr. Allworth (Vice-President), Mr. G. Round (Technical Committee), Mr. F. A. Scott (President), Mr. R. G. Ellis (Honorary Secretary). Sitting: Mr. S. Farrell (Committee), Mr. Walton (Vice-President). Ladies: Miss M. Ellis and Miss C. O'Brien (Committee).

WAVERLEY AMATEUR RADIO CLUB.

The meetings during the past couple of months have been largely attended. The Club is now open on Tuesday nights for buzzer practice and technical discussions.

Additional members have been enrolled, and a boom is anticipated in the near future.

Messrs. Howell and Lavington have been appointed delegates to the Radio Association of New South Wales.

The Club's new tuner has been installed, and is working in a most satisfactory manner, all the Australian and New Zealand coast stations and ships being copied easily on one valve. Several concerts have also been received.

After a great deal of discussion it has been practically decided to install a single tube transmitting set with an electrolytic rectifier. When funds permit a two-valve rectifier and more power tubes will be added.

The Club has also entered for the Trans-Pacific Tests, and for some time to come its activities will be concentrated in preparing for this event. All communications regarding the Club should be addressed to: G. Thomson, 87 McPherson Street, Waverley.

ILLAWARRA RADIO CLUB.

Excellent attendances have been a feature of this Club's meetings during the past few months.

(*Continued on Page* 19.)

When Radio Enters the Home

What It Will Mean to Rural Australia

A Peep into the Near Future

NO one who has followed the truly remarkable progress made by radio during the past few years can doubt that the time is close at hand when, by means of radio telephony, thousands of homes throughout Australia will be brought into intimate touch with the outside world. In seeking for an object lesson as to how far the broadcasting of concerts, news, weather reports and other items will go towards improving the lot of the people living in isolated districts we cannot do better than turn to America. With their usual enterprise in making the most of any invention or discovery which looks like making life easier and pleasanter, and business more profitable, the Americans have exploited the possibilities of radio broadcasting to its fullest extent. Not only have receiving sets been installed in tens of thousands of homes for the entertainment of the inmates, but banks and other big institutions have installed transmitting and receiving sets for the express purpose of providing a service of practical value to their numerous clients. The most specialised farm broadcasting in America to-day is carried out by the leading banking institutions, which send out the latest market reports daily to their country clients, thus enabling them to forward their produce to market when the best prices are ruling. Not content with that, a service has also been arranged by which the latest weather reports and other items of intense local interest are received at the head offices of the banks and posted on boards for the information of country customers who may be in town. America thus teaches a lesson to Australia. Here country folk visiting the capital cities have to rely on the scanty information posted outside the G.P.O. to apprise them of the weather conditions prevailing in the different districts. These may seem small things in their way, but they are of vital interest to those concerned, and the country which pays most attention to them is on the high road towards ensuring national prosperity through the agency of rural settlement.

To obtain an even more arresting picture of what a radio broadcasting service will mean to thousands of homes in outback Australia, it is only necessary to visualise the tremendous boon which the general adoption of motor cars, telephones, mail services, etc., has been to those who have dedicated their lives to pioneering work in the "great outback." Prior to the introduction of motor cars any district not directly on a railway line had to be content with a transport service conducted by slow, if sure, horse or bullock teams. The coming of the "buzz waggon" altered that. Similarly, the introduction of telephones and the establishment of mail services helped, within limitations, to destroy the hitherto hopeless isolation inseparable from rural settlement. It now remains for radio, the greatest discovery of all time, to bridge the gap separating country from city in a way which no other means of communication can hope to equal, let alone excel.

The stately mansion situated in close proximity to the city and the more humble abode out on the edge of the Never Never will be put on an equal footing, so far as communication is concerned, when radio broadcasting becomes an established fact in Australia.

Briefly, the lines on which it is anticipated broadcasting will be conducted in the Commonwealth will

"Wide World" Photo.

EXTREMES IN RECEIVING SETS.

All manner of shapes, sizes and sorts of receiving sets were exhibited at the Radio Exhibition held in New York recently, but not the least important and interesting seen there were the quartette shown above. The big set is of ivory and gold, and cost over $1,000. Ralph Moore (left) is holding his home-made apparatus made with a cigar box. Henry Wolf (6 years old) has one made from a pocket book. Charles Haas (right) has a set made in a match box.

probably be similar to those obtaining in England. The issue of the regulations governing this phase of the matter will define the position, which, in effect, will be that companies willing and able to undertake broadcasting will be obliged to conform to certain laws regarding the manufacture and sale of apparatus. A standard type of receiving set will be manufactured, which, for all practical purposes, will be foolproof. Whether the purchaser lives in close proximity to Sydney or any other broadcasting centre, or hundreds of miles away, makes no difference. Each set will be equipped and adjusted according to the distance over which it will have to receive, and in this way the purchaser will have an absolute guarantee of service.

Simple Sets.

Each set will be simplicity itself, and it can be definitely stated that anyone able to manipulate an ordinary phonograph or a player-piano will be quite at home with a radio receiving set. No technical or mechanical skill whatsoever is needed, and the few simple adjustments which have to be carried out when it is desired to operate the set will be so clearly explained that a child could follow them. The erection of the aerial will be equally simple—just a single wire running from two elevated points, the higher the better.

What It Will Cost.

It necessarily follows that the cost of a set to receive, say, over 500 miles, will be slightly higher than one operating over a quarter or half that distance. This is accounted for by the fact that while one valve may suffice over the shorter distance, two or more will be required when receiving over a greater range. In any case, the cost of the whole outfit, even for the longest distances, will not exceed that paid for an average gramophone. Included in this amount will be the cost of the annual license for receiving the broadcast programmes. A percentage of this sum will go to the broadcasting company to recoup it for the expense incurred, and the remainder will go to the Government.

Broadcasting Programmes.

It is confidently anticipated that the Australian public will expect only the very highest class of vocal and instrumental items to be broadcasted for their entertainment. Bearing this in mind, it can be said with equal confidence that nothing but the best will be offered them, regardless of expense. Programmes of the various items to be broadcasted will be published daily, and all interested will know at exactly what hour the music, weather and market reports, etc., will be sent out.

When the scheme is properly organised it is highly probable that in order to reach even the most distant centres, stations will be established in various parts of the country. The music, etc., from the chief broadcasting centre will be transmitted to these stations over special telephone wires, and from there radiated over the district to be served. This will ensure a service of the very highest quality at a minimum of expense to those living in isolated localities. The truly wonderful sensation of hearing the human voice coming out of space, with all the clearness and quality that one is accustomed to in a face-to-face conversation, will be one not easily forgotten. It is something which will grip Australians as it has gripped the people of other countries. There will, however, be this difference. The confusion and chaos which characterised the commencement of broadcasting in those countries, notably America, will be absent here. The delay in framing regulations and perfecting an organisation which some people are complaining of will later on be recognised as having been well worth while.

1,500,000 Radio Sets.

There are 1,500,000 radio receiving sets in use in the United States, estimates the National Radio Chamber of Commerce. Within the next five years this figure will increase to 6,500,000, says the same authority. That is about equal to the number of phonographs in use to-day.

A New Radio Set Sells an Old House.

Unable to dispose of an old house in Dallas, Texas, an enterprising real estate operator installed the very latest radio receiving set in it, and so advertised in the leading paper. From the dozens of offers that poured in he selected one that enabled him to dispose of the property at a good price.

Call Letters

This is the first list of call letters of Australian and New Zealand ship and land stations. In subsequent issues of "Radio" further lists will appear, all of which should be preserved so that readers will have a complete list of both local and overseas stations.—Ed.

V H A s.s. *Hobart.*
V H B s.s. *Levuka.*
V H D s.s. *Kanowna.*
V H E s.s. *Karoola.*
V H F s.s. *Bombala.*
V H G s.s. *Emita.*
V H H s.s. *Eromanga.*
V H I s.s. *Iron Baron.*
V H J s.s. *Erriba.*
V H K s.s. *Wodonga.*
V H L s.s. *Dimboola.*
V H M s.s. *Kangaroo.*
V H N s.s. *Katoomba.*
V H O s.s. *Canberra.*
V H P s.s. *Nairana.*
V H Q s.s. *Fiona.*
V H R s.s. *Flora.*
V H S s.s. *Lady Loch.*
V H T s.s. *Montoro.*
V H U s.s. *Mataram.*
V H V s.s. *Yankalilla.*
V H W s.s. *Wyandra.*
V H X s.s. *Victoria.*
V H Y s.s. *Ulimaroa.*
V H Z s.s. *Baldina.*
V I A Adelaide Radio.
V I B Brisbane Radio.
V I C Cooktown Radio.
V I D Darwin Radio.
V I E Esperance Radio.
V I F Woodlark Island Radio.
V I G Port Moresby Radio.
V I H Hobart Radio.
V I I Thursday Island Radio.
V I J Samarai Radio.
V I K s.s. *Time.*
V I L Flinders Island Radio.
V I M Melbourne Radio.
V I N Geraldton Radio.
V I O Broome Radio.
V I P Perth Radio.
V I Q s.s. *Buninyong.*
V I R Rockhampton Radio.
V I S Sydney Radio.
V I T Townsville Radio.
V I U Kieta Radio.
V I V Madang Radio.
V I W Wyndham Radio
V I X Misima Radio.
V J A s.s. *Riverina.*
V J B s.s. *Westralia.*
V J C s.s. *Zealandia.*
V J D s.s. *Bingera.*
V J E s.s. *Cooma.*
V J F s.s. *Morinda.*
V J G s.s. *Wyreema.*
V J H s.s. *Loongana.*
V J I s.s. *Suva.*
V J J s.s. *Aramac.*
V J K s.s. *Gilgai.*
V J L s.s. *Werribee.*
V J M s.s. *Alabama.*
V J P s.s. *Bulla.*
V J Q s.s. *Boonah.*
V J R s.s. *Barambah.*
V J S s.s. *Bakara.*
V J T s.s. *Boorara.*
V J V s.s. *Araluen.*
V J W s.s. *Dongarra.*
V J Y s.s. *Mindini.*
V J Z Rabaul Radio.
V K A s.s. *Barunga.*
V K B s.s. *Merriwa.*
V K C s.s. *Milluna.*
V K D s.s. *Aldinga.*
V K E s.s. *Aroona.*
V K F s.s. *Aeon.*
V K G s.s. *Wear.*
V K H s.s. *Saros.*
V K I s.s. *Mallina.*
V K J s.s. *Chronos.*
V K K s.s. *Century.*
V K L s.s. *Monaro.*
V K M s.s. *Woolgar.*
V K N Navy Office, Melbourne.
V K O H.M.A.S. *Cerberus.*
V K P Flinders Naval Base.
V K Q Garden Island Base.
V K R Cockburn Sound Base.
V K S Port Stephens Base.
V K T Nauru Radio.
V K U s.s. *Parattah.*
V K V s.s. *Arawatta.*
V K W s.s. *Ceduna.*
V K X s.s. *Goulburn.*
V K Y s.s. *Marsina.*
V K Z s.s. *Burwah.*
V L A Awanui Radio.
V L B Awarua Radio.
V L C Chatham Islands.
V L D Auckland Radio.
V L H s.s. *Kaiapoi.*
V L I s.s. *Kaitangata.*
V L Q s.s. *Kanna.*
V L S s.s. *Mapourika.*
V L T s.s. *Kaituna.*
V L W Wellington Radio.
V L X s.s. *Tutanekai.*
V L Y s.s. *Paloona.*
V M A s.s. *Arahura.*
V M B s.s. *Karori.*
V M C s.s. *Kauri.*
V M D s.s. *Koromiko.*
V M E s.s. *Rakanoa.*
V M F s.s. *Tarawera.*
V M G Apia Radio.
V M H s.s. *Terawhiti.*
V M I s.s. *Rewa.*
V M L s.s. *Whangape.*
V M M s.s. *Monowai.*
V M N s.s. *Katoa.*
V M O s.s. *Waipori.*
V M P s.s. *Wanaka.*
V M R Raratonga Radio.
V M X s.s. *Rotomahana.*
V M Z s.s. *Mararoa.*

FUSES

All electrical installations are protected by fuses and circuit breakers. If your accumulator is shorted for any length of time and the connecting wires do not melt considerable damage will be done to the accumulator. Therefore, insert a small piece of fuse wire in the A battery leads; the easiest method is to take one strand of wire out of a piece of lighting flexible, remove the lead bar joining two cells of the accumulator and replace the connection with the fine strand of wire. If a short circuit occurs the small strand of wire will melt, and the accumulator will be automatically cut out. The same advice also applies to the high-tension battery.

(*Continued from Page* 15.)

A transmitting and receiving licence has been granted to Mr. C. A. Gorman on behalf of the Club, and great activity is now being displayed in putting the station in proper working order. Renewed interest amongst members is certain to be evinced once the sets are in operation.

One highly interesting lecture delivered before members recently was that on "Crystals," by Mr. Watkin-Brown. Mr. Brown's knowledge of mineralogy and crystallography enabled him to explain many interesting facts concerning crystals, which do not, as a rule, enter into the considerations of the average amateur, and the information gained was greatly appreciated.

At a later meeting Mr. Gorman lectured on "Experimental Wireless from 1911 to 1923," in the course of which he related some interesting facts concerning the doings of experimenters of some ten years ago. He produced a log showing the numerous stations heard and worked. including Macquarie Island (MQI), which was consistently logged—a record for those days. Mr. Gorman concluded with a reference to recent valve experiments, pointing out the great results which are being achieved through the use of radio frequency amplification.

The April meetings of the Club will be held on the evenings of the 12th and 26th.

The Secretary's address is Mr. W. D. Graham, 44 Cameron Street, Rockdale.

NORTH SYDNEY RADIO CLUB.

The members of the above Club have been exceedingly busy during the past month. Much practical work has been undertaken, and in addition a fine series of lectures have engaged members" attention. Mr. C. McClure lectured on "C.W Receivers," and Mr Raymond McIntosh in a series of three discourses dealt exhaustively with "Amplification." The last lecture was devoted solely to the Armstrong super-regenerative receiver.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

The membership of this Club is gradually increasing, due to the fact that business of interest to all radio experimenters is regularly served up.

Mr. W. J. Zech delivered two lectures during February, the first on "Inductance" and the second on "The Condenser and its Uses"

Mr. F. Thompson also lectured on "Alternating Currents."

Members expressed their keenest appreciation of the information gleaned from these lectures.

The Society has now been in existence six months. and judging by its record will accomplish much useful work before the year is out.

MARRICKVILLE AND DISTRICT RADIO CLUB.

The radio enthusiasts of Marrickville and District have not been slow to show their appreciation of the above Club. The membership is constantly increasing, and now includes several ladies. A qualified wireless operator is present at all meetings, and the office-bearers include two radio mechanics, whose advice and assistance regarding the construction of apparatus is always eagerly availed of by members.

The Club receiving set will be in operation in the near future. A publicity and entertainment committee has taken charge of social matters, and a dance is to be held at an early date.

The Secretary (Mr. R. G. Ellis) is thoroughly experienced in radio matters. He was apprenticed to the trade eleven years ago, and later served with the Wireless Squadron in India, Egypt and Arabia during the war

Can it be wondered that a Club so well equipped with competent and enthusiastic officers should make the excellent progress which has marked the Marrickville's Club's existence?

MANLY RADIO CLUB.

The Manly and District Radio Club was formed on February 26 under circumstances which tested the enthusiasm and initiative of all who made up their minds to be present.

Firstly, heavy showers of rain made outdoor conditions unpleasant, and, secondly, the failure of the electric light rendered it necessary to use candles to light the hall. But neither the rain nor the poor illumination affected the enthusiasm of those present, and when the meeting was well in progress, under the able chairmanship of Mr. F. C. Swinburne (one of the promoters of the Club), the "juice" once more consented to flow, and the room was flooded with light.

After the objects of the meeting had been explained, and the desirability of forming a club affirmed, the various matters incidental thereto were decided by the meeting.

Twenty-seven members joined the buzzer class, which it was decided should be held every Wednesday evening.

The election of officers resulted as follows: President: Mr. F. C. Swinburne. Vice-President: Mr. A. Brown. Secretary: Mr. O. Sandel. Treasurer: Mr. F. Clark. Committee: Messrs. M. Dixon, C. Crocker and B. Symes.

At the first General Meeting of the Club, held on March 5, the business consisted of a lantern lecture on the world's high-power wireless stations by Mr. F. C. Swinburne. The lecturer dealt with his subject in a lucid and interesting manner, and the large audience was enabled to appreciate the scope and dimensions of radio work in different parts of the world.

KURING-GAI RADIO SOCIETY.

Excellent progress has marked the activities of the above Club since the inaugural meeting early in December. The membership is now close to the fifty mark, and at the steady rate of progress being achieved, it should soon be doubled.

At the first meeting in March Mr. R. Hill lectured on valve circuits, in the course of which he explained all about high and low frequency amplification.

The Society has joined up with the newly-formed Radio Association of New South Wales, and on a ballot being taken Mr. Renshaw was elected as delegate.

The Link That Will Bind

Direct Radio Service to England

Last Barrier Removed

FEELINGS of relief and satisfaction were felt on all sides sides at the recent announcement that the British Government had decided to allow private enterprise to erect radio stations in England, capable of transmitting direct with overseas countries. For many months the question was in abeyance, and beyond an admission that the "Government was considering the matter," the Prime Minister (Mr. Bonar Law) would make no definite statement. Now that the issue is decided, and the path ahead quite clear, those interested in spreading the network of radio between the most scattered portions of the British Empire may be expected to get busy.

The next two years should witness unprecedented activity in the erection and operation of high-power radio stations. Once that becomes an accomplished fact the few remaining doubtful ones regarding the value of an inter-Empire radio service will have their fears dispelled. Most people are aware of the partnership existing between the Australian Government and Amalgamated Wireless (Aust.), Ltd., for the conduct of a direct high-power wireless service between Australia and England. Business men in both countries rejoice that the inauguration of this service will mean a one-third reduction in the present cost of cabling, added to which the messages will be handled with a consistency and despatch which the best organised cable service could never hope to equal. This cost-cutting will unquestionably stimulate business at the very outset, mainly because of the increased facilities it will afford for ascertaining the requirements of the different countries.

Furthermore, the wireless transmission of news at a cheaper rate than at present will enable the daily newspapers in both countries to devote considerably more space to publishing news matter calculated to bring the peoples of the different countries into closer and more intimate touch. Isolation breeds misunderstanding and distrust, to say nothing of perpetuating in the minds of the people of the British Isles an ignorance regarding the possibilities and aspirations of Australia, which is as regrettable as it is harmful.

The defence of the British Empire is also another matter definitely linked up with the establishment of long-distance radio services. The cable lines invariably receive the attention of the enemy immediately on the outbreak of war, and once this means of communication is severed a serious position arises. A direct radio service will obviate this possibility, mainly because the stations will be located in a position practically immune from attack, and once the messages are transmitted their safe reception follows as a matter of course.

Australia may well congratulate herself that in a comparatively short time she will be placed in a forefront position so far as up-to-date communication with other parts of the world is concerned. No fears need be felt as to the ultimate success of the venture, and it is safe to prophesy that a few years hence people will wonder how any progress worth mentioning was achieved without the aid of radio.

"Wide World" Photo.

PULLING TEETH BY WIRELESS.

One of the latest accomplishments of the radio world is that of pulling aching teeth. Dr. A. E. Wood, of the s.s. "America" recently directed a successful operation of this nature at sea, the first in the history of wireless. Photograph shows the surgeon and the ship's wireless officer sending directions.

The Deaf Hear

Faith-Healing Outdone

Radio to the Rescue

Radio already has a long record of service in the cause of humanity to its credit, and one expects from day to day to hear of something even more wonderful being achieved.

Most experiments and discoveries stand to the credit of overseas research, but it is refreshing to know that one of the most wonderful uses to which radio has yet been put was undertaken in Melbourne recently by Amalgamated Wireless (Aust.), Ltd., in conjunction with the Deaf and Dumb Institute. Twelve children, whose ages ranged from eleven to sixteen years, were chosen for the experiment. A number of them had been deaf from birth, and the sensation of ever having enjoyed the sense of hearing in any shape or form whatsoever was unknown to them. It is easy to imagine, therefore, their unbounded joy at being able to hear the signals which were transmitted through the ether and became audible in the receivers clasped over the children's ears. This feeling was not confined to the children; it was shared equally by the parents and all who have an intimate knowledge of the unhappy plight of these who are denied the joy of hearing the voice and other sounds, which mean so much to every human being.

Those responsible for the Melbourne experiment were highly gratified at the results achieved. The fact that children who had never previously enjoyed the gift of hearing were able to distinguish the radio signals opens up a field for investigation which may possibly be attended by the most important results. About the time the Melbourne experiments were carried out similar efforts to break down the barrier of deafness were undertaken in London. There, too, a great measure of success was achieved. A small boy, who had been deaf from birth, described music as sweet and harsh sounds. He excitedly beat time to the rhythm of a fox trot, and then defined the differences between the sound of the human voice and music.

One need not be an optimist to visualise the revolution which is likely to occur in medical circles if, as is highly probable, deafnesss can be overcome by the use of radio.

OBITUARY

MR. L. L. MEREDITH

Wireless men throughout Australia, New Zealand and other parts of the world will be sorry to read that Mr. Llewellyn L. Meredith, late Traffic

Manager of Amalgamated Wireless (A/sia), Ltd., passed away in Sydney on March 18, and it is with very deep regret that we record his death in these columns.

The late Mr. Meredith was born in London on February 24, 1885, and first became associated in commercial wireless with the Marconi Wireless Telegraph Company of England in March, 1910. After serving as junior operator on the *Empress of Britain* and *Ben-My Chree*, he was in May, 1910, appointed senior operator of the *Montrose*, and later served on the *Himalaya, Batavier III., China* and *St. Louis*. In November, 1910, he crossed the United States and joined the Union Company R.M.S. *Aorangi* in San Francisco, and thus entered the Australian service. During his time at sea in the Australian service he served on the *Tofua, Bombala, Maunganui, Kanowna* and *Katoomba*, and in January, 1913, was appointed sea-going Sub-Inspector of Amalgamated Wireless (A/sia), Ltd. In May, 1915, he was transferred to the Sydney office, and later was appointed Traffic Manager. He held this position until 1920, when, owing to ill health, he reluctantly resigned from the Company, and since then has been residing in Sydney.

The funeral took place at Rookwood Cemetery, Sydney, on Monday, March 19, and those present included: Mr. F. W. Larkins (representing Amalgamated Wireless, Ltd.), Captain S. Toombs (representing Radio Telegraphists' Institute), Mr. A. R. Mancer (Marconi Schools of Wireless), Mr. S. E. Tatham (The Wireless Press), Mr. A. Vipan (Technical Department Amalgamated Wireless), Messrs. P. M. Farmer and W. H. C. Phillips (Inspectors, Traffic Department); Sub-Inspectors T. A. Jones (s.s. *Katoomba*), H. Johnson (s.s. *Kanowna*), A Beard (s.s. *Victoria*); Wireless Operators: J. W. Mackay, G. Pow, F. A. Cooke, J. F. McGinley, T. O. Sexton, E. F. Hayes; Mr. De Laurence, of Cronulla, N.S.W., and Mr. S. Stacey, of Stacey & Co, Sydney.

The many wireless men who came in contact with the late Mr. Meredith will well remember him for his great personality, and being a very popular man, he had a wide circle of friends quite outside the wireless sphere altogether.

On our own and their behalf we extend the deepest sympathy to his family, who reside in England, in their sad bereavement.

WIRELESS OFFICERS' MOVEMENTS

Mr. T. Bannister, who met with an accident to his leg on the s.s. *Montoro* while Chief Wireless Officer of that vessel, and who subsequently underwent an operation at Prince Alfred Hospital, is now recuperating at Katoomba, New South Wales.

Mr. H. J. Byrne is now Wireless Officer of s.s. *Karoola* in place of Mr. N. Marshall, who has resigned and taken up a shore position. Mr. Byrne was attached to s.s. *Gengarra* (City Line) for eight years, and has just completed a voyage to the United Kingdom on s.s. *Bulla*.

Mr. H. H. Jeremy, who for the past eighteen months was Chief Wireless Telegraph Officer on s.s. *Gorgon*, has been relieved by Mr. M. L. Robertson, of the *Echuca*, and is now standing by in Sydney.

Mr. Gordon Ross, who was landed from s.s. *Charon* critically ill with malignant malaria, is now progressing satisfactorily at his home in South Perth, Western Australia.

Mr. J. Gilligan has transferred from s.s. *Mallina* to s.s. *Moira*.

Mr. E. H. Pollard has transferred from s.s. *Eastern* to s.s. *Arawatta*.

Mr. T. Bearup, for many months stationed at Kooweerup Experimental Station, has now been transferred to s.s. *Cooma*.

Mr. H. Taylor has returned from sick leave, and has joined s.s. *St. Albans*.

Mr. R. H. Alexander has now severed connection with Amalgamated Wireless, and is shortly proceeding to Rhodesia.

LIFE SAVING AT SEA

Life saving at sea is not confined to the launching of boats when a dis-

"Wide World" Photo.

AN UNSEEN AUDIENCE.

Barbara Wagoner, daughter of an Official of the General Electric Company in the United States, is a rapt listener-in at a new type of radio receiving set.

aster happens. Frequently serious illness occurs, and when no medical man is on board the position is desperate. Such a happening occured recently, and due to the fact that the R.M.S. *Makura* was in radio call the life of a seaman on board the tramp steamer *Las Vegas* was saved.

A severe attack of fever gripped one of the crew of the latter vessel, and in addition his eyesight became threatened. The captain of the *Las Vegas* sought the advice of the doctor on board the *Makura*, and after describing the symptoms was advised of the proper treatment to follow. Four days later Captain Braunfi of the *Las Vegas*, radioed the doctor on the *Makura* as follows: "Patient fully recovered; many thanks; your services greatly appreciated."

A FEW TIPS ABOUT VALVES

Don't burn vacuum tube filaments above their rated amperage and voltage.

Don't rely on an ammeter for proper current consumption; filament should be burned at constant voltage rather than constant amperage. Don't insert vacuum tubes in sockets unless absolutely certain rheostats are turned off, or at the proper setting for normal operation.

Don't make the drastic error of connecting the plate battery to the filament terminals; watch all battery connections.

Don't energise the filaments of all the tubes in a cascade circuit at once, unless the circuit has been used before.

Don't take one tube out of a cascade circuit in which the filaments are in parallel. It causes a rise in current in the remaining filaments, and may burn them out. Cut off all the power first.

Don't make any alterations in your wiring while vacuum tubes are in their sockets. It is quite a common thing for 40 or 60 volts to become twisted up in the filament circuit as a result of this practice. High voltage for the filament spells disaster for your tube.

Don't expect to have a loud speaker operate from a detector tube; you will be disappointed. At least one stage of audio frequency amplification is generally necessary.

Dont forget that vacuum tubes cost from twenty to thirty times the price of an ordinary electric lamp, and therefore deserve a little respect.

Don't expect to get the best results if you use an amplifier tube as a detector, or *vice-versa*.

KISSED BY RADIO

Thus ran the headline of an article of recent date, when some lovesick experimenter tried his luck at long-distance kissing. The object of his adoration was about 300 miles away.

We were just wondering if the blush accompanied the kiss, which would indicate perfect reception.

ISN'T RADIO WONDERFUL?

Come, for the night is falling,
And my sets is tuned so fine
It will pick up a peal of thunder,
Or the red ant's plaintive whine.
Come! And sit close beside me.
My head-phone's built for two.
It will be a night of rare delight—
With the world's wild sounds—and you!

Beginner (Manly): The surest and quickest way of learning the Code is by patient practice with a buzzer and key. If you have a phonograph it is possible to obtain records which at either slow or fast speed spell out the Morse Code. There are also books on the subject which you would find very helpful.

Question (Oscil, Newcastle): Does a valve receiver, when oscillating, transfer energy to the aerial and thus act as a transmitter?

Answer: Yes, whenever a valve oscillates the set acts as a transmitter, and any receiver in close proximity tuned to the same wave length would be effected by the radiated oscillations. The set, of course, would be a very inefficient transmitter.

Question (F.M.W., Newtown): What is the best point to use with galena crystal?

Answer: The scheme most successfully used by marine operators in the crystal days was as follows:

Take a small length of a single strand from a copper flex lead, and attach to the end of a six-inch length of No. 26 cotton covered wire, which, by winding a few times round a pencil, is in the form of a spring. Connect the free end of the No. 26 to the terminal, and make crystal contact with the fine copper wire. The lighter the touch the better, and when you have found a sensitive spot the point will be held there by the spring formation of the No. 26 wire. You will be surprised at the results, providing, of course, your crystal is good.

Question (L.V.J., Mosman): I am thinking of designing my own valve receiver along the same lines as the circuit illustrated on page 281 of Bucher's "Practical Wireless Telegraphy," but, being somewhat confused by the different circuits my friends are using, would be obliged if you would advise me a good standard circuit.

Answer: The diagram on page 281 of "Practical Wireless Telegraphy," showing the connections of a "beat" and "amplifier" valve receiver is quite satisfactory, and the receiver is capable of great selectivity and sensitiveness. The Marconi Co. (England) usually dispense with the grid condenser (C3) and the plate current tuning condenser (C4) as being unnecessary refinement, but this, of course, is a matter for you to decide.

M.K. (Turramurra): Please send us stamped and addressed envelope, and we shall be glad to forward the particulars you require. If you are at present only using a crystal receiver, we most strongly advise you to gain a good knowledge of the operation of an ordinary single or two valve receiver before you tackle the Armstrong super-regenerative circuit, which requires extremely fine adjustments and a good knowledge of valve receiving before it can be successfully used. Why not try the circuit described and illustrated by Mr. J. G. Reed in the December issue of *Sea, Land and Air*.

Question (Home Made, Coogee): How much No. 40 wire would be needed for a telephone transformer?

Answer: Three ozs. of No. 40 wire for the H.R. winding, and six ozs. of No. 32 wire for the L.R. winding.

Honeycomb (Neutral Bay): That is a question for the Controller of Wireless, so we suggest you write direct. In any case, do not cross the telephone wires at less than 5 feet.

Curious (Balmoral): Subject will be dealt with in our next issue. Yes, a stamped and addressed envelope.

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