

RADIO

IN AUSTRALIA
& NEW ZEALAND
Incorporating "Sea Land and Air"

VOL. I.

OCTOBER 17, 1923

No. 15



Mr. C. Culliver (3 DP), Sir John Monash and Mr. J. Malone conducting a joint appeal to experimenters by wireless to swell the funds of the Melbourne Conservatorium of Music.

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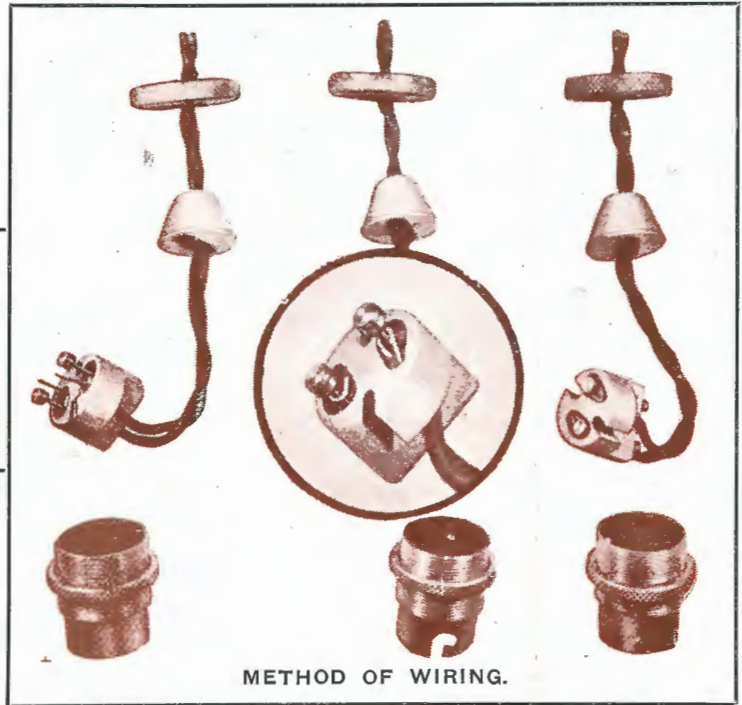
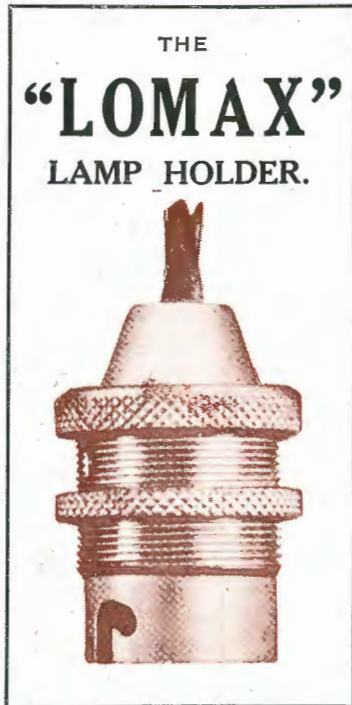
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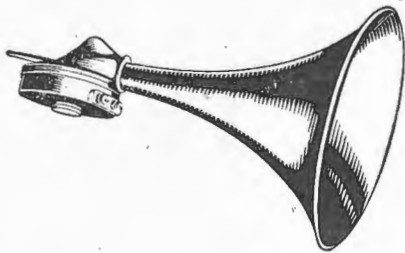
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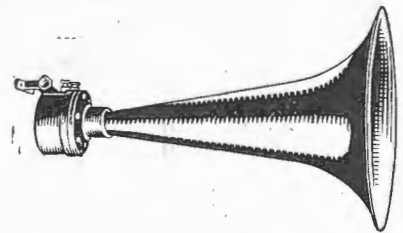
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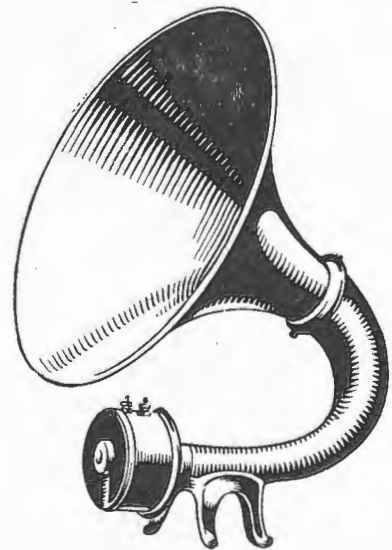
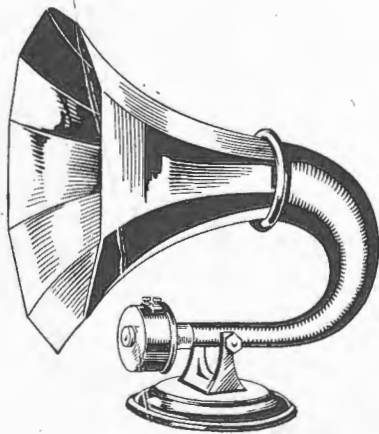
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Regenerative Receivers

IN this issue of *Radio* appears a letter written to the Editor by the Chief Manager of Telegraphs and Wireless on the subject of the sale and use of regenerative receivers.

THIS question has had considerable publicity, and, although the position has been improved somewhat of late, "howling valves" are still prevalent in the ether around Australia.

THE letter referred to above should be carefully read by all persons and firms retailing and using wireless receivers.

THE writer had occasion recently to conduct special receiving tests on wave-lengths between 200 and 300 metres.

AT the time of the tests several experimental radio-telephone stations were testing and, although the tuning of the transmitters was sharp, the reception of the

tests from other stations was rendered impossible through interference from "howling valves."

THIS is not an isolated case by any means.

IN the interests of all wireless experimenters regenerative circuits should be discarded. Practically the same results can be obtained without employing regeneration in the aerial circuit.

IF the "howling valve" nuisance continues it will mean great interference during the forthcoming Trans-Pacific Tests, and, furthermore, it is liable to retard the progress of local experimenters.

THE new regulations prohibit the use of regenerative receivers, except in special cases.

THEREFORE *Radio* appeals to every genuine experimenter to assist in seeing the regulations observed.

AFTER all, they give licenced experimenters great liberty and that at least should be respected.

Country Interests Should be Safeguarded

THAT residents of the country districts of Australia are fully alive to the value of radio broadcast services is apparent to those who are able to establish contact with them.

IN fact, there is a degree of knowledge and understanding of radio possibilities amongst country people which is surprising in view of the limited opportunities they have had of ascertaining just how far the science has stepped down from the high level of the technical mind to render service in the everyday affairs of life.

IN view of the early commencement of broadcasting this is a point on which all who are commercially interested in the undertaking must needs feel pleased.

WHERE radio broadcasting programmes are a luxury in and around the capital cities, they are a necessity in the country.

THEREFORE, it is to the country that Broadcasting

Companies must look for the greater part of their revenue, and provided proper attention is paid to these districts, the results will probably exceed all expectations.

IT cannot be too strongly emphasised that anything which savours of underhand dealing will have a most harmful effect on the enthusiasm of country residents.

IT is not suggested that any firms legitimately engaged in pushing radio business in the country will resort to any shady practices, but in order to strengthen their position they should, as far as possible, see that no one less scrupulous than themselves is allowed to impose on would-be patrons of radio services in the country.

The "Leviathan's" Wireless Equipment

America's Biggest Ship

Three Complete Sets

Four Separate Aerials

AFTER having been reconditioned by the United States Shipping Board, the s.s. *Leviathan*—America's biggest ship—has now entered the Atlantic service and is fitted with a most complete and powerful radio equipment.

It is claimed that the *Leviathan* is now fitted with better wireless equipment than many coast stations were a few years ago, and so extraordinarily efficient is the transmitting and re-

ceiving apparatus that the station could really be called a sea-going radio central.

ceiving apparatus that the station could really be called a sea-going radio central. Three complete sets are installed, comprising three separate transmitting and three separate receiving sets. Aerials are suspended in various directions over the ship and so arranged that with specially tuned apparatus connected to them it is possible to operate two of the transmitting and

two of the receiving sets simultaneously without any interference. The *Leviathan* is able to talk by radio with the shore on a duplex system, and, at the same time, carry on radio telegraph commercial traffic in both directions with other stations.

The high-power transmitter is rated at six kilowatts and uses water-cooled tubes for modulated continuous wave transmission. Power is supplied from a 10 k.w. motor generator.

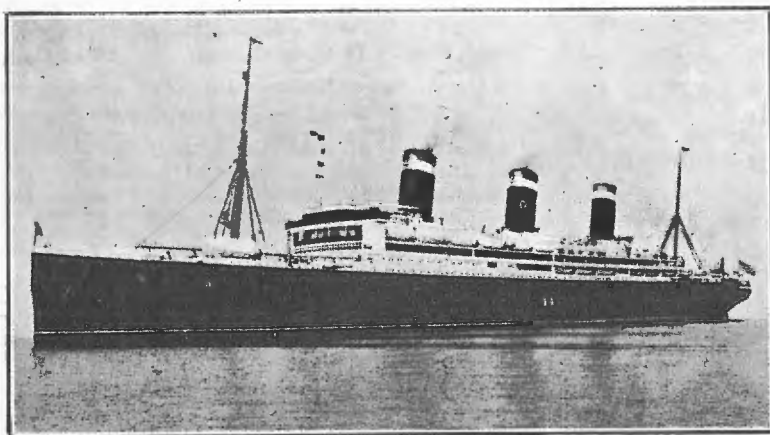
600 feet long, and consists of a 10-inch cage suspended between the two masts.

A 750-watt transmitter connected to a separate aerial, 500 feet long, is used for duplex radio telephone work with other ships and shore stations. This transmitter enables passengers on the *Leviathan* to use a telephone and talk through the ether with persons ashore or afloat in exactly the same way as they would use an ordinary telephone on shore. The receiving apparatus for this duplex telephone set uses an independent aerial running forward from one of the masts. A similar aerial running aft is utilised for long wave reception in connection with the traffic handled by the six kilowatt set.

The third transmitter is a Spark Type rated at two kw. This set is not provided with a separate aerial, as it is designed to be of an emergency nature. When in use, however, it is connected with the aerial normally used for the duplex telephone set. Practically all traffic handled by the *Leviathan* is transmitted on either CW or ICW.

No less than three motor generators are necessary to supply the power for the above mentioned equipment. There is also a special storage battery of 125 volts and 240 ampere hours capacity. This battery is kept fully charged at all times so that in the event of the ship's dynamos failing, sufficient power is available to carry on work for at least four hours.

Engineers of the Radio Corporation of America installed this up-to-date equipment; and during the *Leviathan's* first trip, so great was the volume of traffic that it was found



America's biggest ship, the "Leviathan," which is fitted with the very latest wireless equipment.

This set enables the *Leviathan* to keep in constant communication with both sides of the Atlantic Ocean during the voyage, as well as communicate with ships thousands of miles distant. The transmitter puts 30 amperes into the aerial when working on 1800 metres, 31 amperes on 2100 metres, 29.5 on 2400 metres and 29 amperes on 2500 metres. The aerial used for this transmitter is

necessary to use two transmitters and two receivers practically continuously.

The radio staff of the *Leviathan* consists of one chief operator and five assistants. Additional to handling traffic to and from the *Leviathan*, the radio operators also relay messages from other ships with not sufficiently powerful apparatus for communication with long distance stations. The great power of the *Leviathan's* apparatus enables traffic and signals to be exchanged with ships and coast stations at very considerable distances.

The Farmers' Loan & Trust Company of New York City has established a branch office on the *Leviathan*, and they utilise the radio equipment for mid-ocean banking and also the transfer of money payments to the shore.



A corner of the "Leviathan's" Wireless Operating Room,

Wireless Exhibition

The Wireless Institute of Australia, New South Wales Division, has made arrangements to hold a Wireless & Allied Electrical Exhibition in the Sydney Town Hall from December 3 to 8. This Exhibition will provide an opportunity for the general public to see Wireless Equipment in its various wonderful stages of development.

The members of the Wireless Institute of Australia are an enthusiastic body of men who devote much of their time to experimenting and carrying out unusual tests with the object of discovering something new in radio work. Their activities are purely voluntary, and in no way connected with commercial enterprises.

Many of the ingenious pieces of apparatus designed and very often made by these experimenters will be on view, and will serve to give the visitors to the Exhibitions some indi-

cation of the valuable research work carried on by Members of the Wireless Institute.

In addition to the apparatus to be shown by experimenters, the numerous firms interested in Wireless are taking special pains to make the exhibition a success. Already many firms have arranged for stands to show Wireless apparatus for Broadcasting, ships, aircraft, inland telegraph and telephone services, and there will even be some information in regard to the giant International station which will very shortly be built to place Australia in direct wireless communication with the United Kingdom and with other parts of the world.

The popular interest will doubtless be centred in Broadcasting features, and on many stalls Broadcasting Receivers of various types, but all

made in accordance with the Government requirements, will be on view. This will provide the general public with an advance introduction to Broadcast Receivers and no doubt, many mental notes will be made as to the type of receiver that will be purchased for the Broadcasting services which will then be about to commence.

A great variety of the more important parts used in conjunction with Broadcast Receivers, such as valves, telephones, and loud speakers will be displayed on a liberal scale and in many cases practical demonstrations will be given for the benefit of all those visiting the exhibition.

For the experimenters the many exhibitors will display all sorts of apparatus and parts so that the man with a scientific turn of mind will be able to select the very latest and best equipment for his requirements.

MAKE SURE of Receiving "Radio" regularly by placing a standing order with your news agent, or sending 10/- for one year's subscription to:

THE WIRELESS PRESS, 97 CLARENCE STREET, SYDNEY.

Wireless Broadcasting

Lecture by Mr. George A. Taylor

ON Tuesday evening, October 2, Mr. George A. Taylor, President of the Association for Developing Wireless in Australia, New Zealand, and Fiji, and Chairman of the recent Broadcasting Conference in Melbourne, threw some light upon the present situation of Wireless in an address before members of the Neutral Bay Radio Club and other clubs on the north shore of Sydney.

Referring to Broadcasting, he pointed out that it is worth particular attention as upon its success or otherwise the future of Wireless in Australia depends.

Continuing he said: "To look back but a year or two we find America crazy regarding Broadcasting, the issue of licenses being particularly free, creating a considerable amount of trouble.

"England carefully studied the American situation, and gave six firms a practical monopoly of Broadcasting, so that 'listeners-in' had to take what was given to them; but the receivers had no sealed sets.

"At the request of the Postmaster-General all the leading Wireless

authorities in Australia were invited to a conference in Melbourne on May 24, when Regulations for Australian Broadcasting were drawn up. The Regulations were approved by the conference and gazetted on July 25, 1923. Since then there has been a considerable amount of misunderstanding, covering the personnel of the members of the conference, the adoption of the single wave principle, and the question of the £1000 guarantee.

"Taking the personnel of the members of the conference, as Chairman of the conference, I must affirm that there was no interstate bias. There were 58 firms represented, including 11 Australian firms with branches in each State, 32 Victorian firms, 12 New South Wales firms, and one each representing the remaining States, so that Victoria, from which place complaints have been received that New South Wales interests predominated, had the majority.

"At the opening of the proceedings I specially asked if any person present had any particular scheme. Mr. Fisk had the single-wave idea, but he

refused to submit it until I was satisfied that there was no other scheme available for discussion, so the single-wave scheme was taken as a scaffolding to help build the conditions as gazetted. This single-wave principle will protect Broadcasting stations against any interference, and will also protect the clients from any jamming or discomfort.

"Regarding the £1000 guarantee required before any Broadcasting company can begin business, this is necessary to protect the public.

The Postmaster-General in reply to firms desiring to give free Broadcasting services informed them that if they applied independently for licenses on the six available wavelengths between 250 and 550 metres, each would be granted one provided the conditions of the £1000 guarantee and the five years' period were attended to.

"This is in accordance with the Regulations, and is particularly liberal, as multi-wave length receivers would be approved and sealed up to 550 metres, giving listeners-in a very wide range of reception. The £1000 guarantee, however, is the stumbling block, and yet such guarantee is necessary, not only to protect clients, but to protect Wireless, for no believer in the possibilities of the science would care to see it handicapped in the same way as aviation has been by the formation of companies that have not been successful.

"The Wireless Regulations, therefore, are the best procurable. A fair trial is requested for them, and if any mistakes be then discovered steps can immediately be taken to set them right. There is one important factor necessary for success in Wireless development, and that is the absolute requirement for every experimenter to prevent interference."

Mr. Taylor concluded by stating, "The Peace of the World is going to be secured by the Nations that hold the greatest scientific conquests, and as Wireless is the greatest of sciences, its experimenters can be the greatest peace-makers.



Mr. Miller and family of Adelaide, S.A., waiting for one of the local experimenters to commence testing. This will be a common event in many Australian homes within the next two months when Broadcasting will no doubt be in full swing.

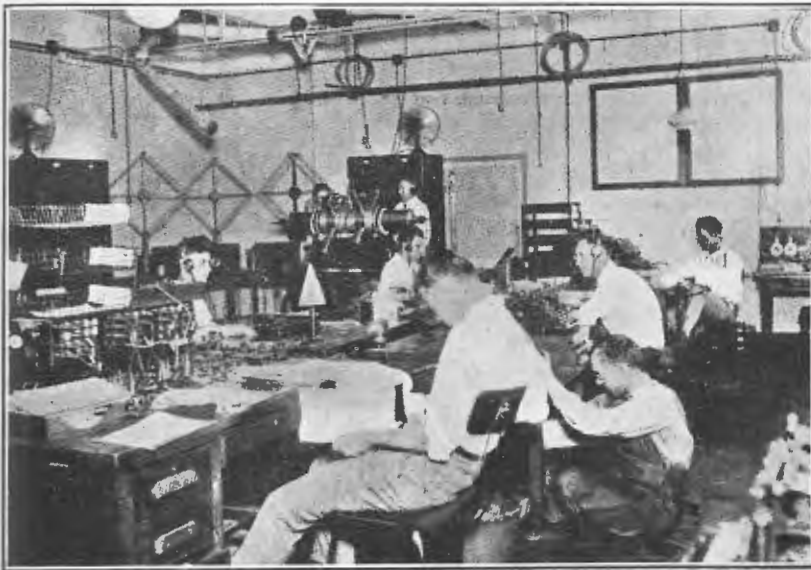
Static Eliminator

ACCORDING to the latest advice from America, the United States Navy Department claims to have devised a system for reducing atmospherics to a minimum.

The device is known as a Clarophone and was invented by William J. Scott, an electrician in the United States Navy. He began work on his static eliminator eleven years ago and filed applications for patents early in 1921. So far very little has been made public except that the Scott Clarophone is an accoustical device for the elimination of static. It has

leads are carried almost 300 feet to the operating room. By adjusting the loop and short aerial, it is found that the opposing forces of the two tend to neutralise static.

Static is then further reduced by using Scotts Clarophone, which is a very peculiar looking piece of apparatus. It consists of a large metallic cylinder about four feet long and eighteen inches in diameter, the ends being adjustable. From this cylinder eight small tubes project radially in pairs, each of the projecting tubes containing a telephone receiver for



The main Radio Central Telegraph Room of the United States Navy Department. From this room messages are transmitted to various parts of the world. The Static Eliminator, known as the Scott Clarophone, is the instrument in the background in the form of a large horizontal cylinder with small cylinders or tubes projecting from it.

very selective action and subdues mechanical sounds of a discontinuous character, sustaining the continuous notes and uniformly pitched sounds and makes it very easy to read stations transmitting over long distances through static interference.

At the present time the Navy Department is experimenting with this device on the top of their building where there is an 8ft. loop from which extends a 75ft. one-wire aerial. Both the aerial and loop are connected to a barrage receiving set immediately below the loop. From this receiver

introducing radio signals received from the radio set into the receiving chamber. When the sound of the incoming signal has passed through the cylinder accoustically, it is broken up several hundred times by an internal arrangement. It is claimed that the static is absorbed by over 10,000 separate pieces used in the construction of the cylinder. The sound waves are absorbed in the filtering process and a weak but clear note is picked up by the telephone receivers in the eight tubes. If the out-coming signals are found too weak they may be amplified in the usual way.

Wireless was Wrongly Blamed

For American Warship Disaster

Direction-finding Apparatus Vindicated

The published announcement that wireless direction-finding apparatus was responsible for the loss of the seven American destroyers which ran ashore on the Californian Coast some weeks ago was, as those competent to judge declared at the time, entirely groundless.

In recent months the public have been told of many instances in which direction-finders were responsible for saving human life and shipping.

They have been told also that this newest development of wireless is destined to play an important part in the navigation of ships in foggy waters such as the English Channel and off the American Coast.

Consequently the news that seven destroyers of the American fleet had been sent to their doom through depending on directional wireless left them wondering.

Could it be that in a great crisis the apparatus had proved misleading or inefficient?

Only for a brief period was the question left unanswered, but it is probable that out of the many thousands who read the original announcement, only a small proportion are aware that the matter was ever set right.

A few days after the first news of the disaster was published, the following announcement appeared in the daily papers:—

RADIO DIRECTOR.

"Captain Wilson, commander of the destroyer squadron wrecked on the American California coast, has taken full responsibility for the disaster. 'IF I HAD OBEYED THE DIRECTIONAL WIRELESS THERE WOULD HAVE BEEN NO WRECK,' he said; 'BUT I COULD NOT BELIEVE IT AGAINST THE FIGURES OF OUR RECKONING. I had to make a decision and took a chance!'"

Tradition dies hard, and it is unfortunate for Captain Watson and all concerned that he clung so tenaciously to the theory that where the direction-finding apparatus indicated a position different from the other method of reckoning the former must necessarily be wrong.



The Radio King

Published by special arrangement with Universal Films. Adapted from the Universal Chapter Play, "The Radio King."



SYNOPSIS OF PREVIOUS CHAPTER.

Marnee, an Electrical Wizard, fostering a feeling of anarchy, has imprisoned Jimmy, an orphan boy, to help him in his nefarious schemes. Jimmy having learnt the code and signals of Marnee's super wireless plant, sends out a message for help to Bradley Lane, a wealthy scientist and detective. He is interrupted by Marnee, who receives Bradley Lane's reply that he is coming to Jimmy's assistance. Leaving his instruments Marnee goes upstairs and informs the revolutionaries that Bradley Lane is coming; telling them to send him below and he, Marnee, will deal with him. John Leyden, another scientist, is working for the Government, endeavouring to perfect a scheme by which he can recall all wireless messages from the air. Almost every experiment in this direction is frustrated by Marnee.

BRADLEY LANE, rising from his instruments, makes all preparation to leave on his mission of rescue, when his indicator on the wall shows him that somebody is approaching up the stairway to his apartment. The indicator shows that the visitor has halted outside his door. Lane has devised another contrivance which enables him to see clearly, any person approaching his apartment, and this instrument discloses the image of a man heavily wrapped in an overcoat, which leaves only his eyes visible. Fearing a move on the part of Marnee, his enemy, Lane goes to a cabinet set in the wall and releases an automaton in the shape of a life-sized figure of a man. Dressed exactly as Lane dresses the automatic figure moved down the hall with a perfectly life-like carriage; sufficiently so to deceive the unwelcome visitor. The ruse was successful. The Mystery Man creeping on the figure from behind violently attacked it, only to

find his mistake when seized by Bradley Lane, who had calmly stood by and reviewed the incident. After a short, sharp struggle, Lane overpowered his visitor, thrust him in his apartment, and disguised in the man's attire set out to rescue Jimmy. Outside he found the car waiting for



Bradley Lane, "The Radio King," is a real wireless enthusiast—he reads "Radio."

the Man of Mystery. Disguised as he was he had no difficulty in persuading the driver to return to the house of the Brotherhood. Here his difficulties commenced. How was he to gain admittance to this stronghold with its heavily bolted doors and shuttered windows without the password which he knew was so necessary. A survey of the situation showed him that the only course open was to boldly approach the door and demand admittance, trusting to his disguise

to carry him through. A knock on the door and a small panel opened, disclosing the evil face of Ivan Renally. The door opened and Lane was confronted with the close and impudent scrutiny of the group.

"What have you to report, Man of Mystery?" asked the leader, Renally. "All is well," came from the cloaked figure.

"Good, friend. If all is well go below and give your report to our Chief, Marnee."

Could Lane have but known that Renally was fully aware of his deception he would never have acceded to the request to visit the Wizard's basement. Still, long experience and training, due to his investigations in the criminal world, had made him cautious, and fearing a trap of some kind, he chose to find his own way to the basement rather than use the stairway indicated by the leader of the Brotherhood. Trying many doors Lane at last succeeded in finding one unlocked. This door led to the living apartment occupied by Marnee. His disguise had served its purpose, and knowing Marnee for the desperate criminal that he was, Lane required the utmost freedom possible in the event of a struggle which he was certain would come. The hissing and crackling caused by Marnee's transmitting apparatus drew his attention to a chamber on the opposite side of the living room, and boldly thrusting open the door he came upon Marnee and Jimmy. A hasty glance about the apartment astounded him. That such a high-power and complete radio station could be concealed in the very heart of the city without knowledge

of the authorities seemed impossible, but yet there it stood. A motor generator droning away supplying current for a high-power electric arc, such light, such complicated apparatus Lane had never conceived in the whole of his scientific career. Then the transmitting plant. He had visited many high-power stations, in fact, almost every Government radio station in existence, but had never come across such a unique system of the transmission of messages through space. His attention was attracted by the demoniacal laugh of Marnee, whose twisted mind was absorbed with his instruments.

"I've jammed him! I've jammed him."

This cry applied to the frustration of further experiments of John Leyden, still conducting experiments in his laboratory.

"I cannot understand it, Ruth. Every time when I am just on the point of success some atmospheric disturbance stops my experiment. What can it be?"

But Ruth, even though her father's right-hand assistant in all experiments, could offer no explanation.

Could Leyden have but known the cause of his annoyance he would perhaps have made provision to overcome it, but he honestly believed that his failure was due to a clash between his receptor and the elements and instead of recalling messages he was picking up static.

But to return to Marnee. His unnatural instinct told him of the presence of Bradley Lane in the room, and with an animal-like cry he turned. Jimmy who had gained courage by the presence of Lane felled his fiendish master to the floor, but unfortunately Marnee fell right against



Having almost electrocuted Bradley Lane, Marnee and his confederates take Jimmy, the boy, away and leave Lane to his fate!!

the switch round which he had built his hopes of destroying Lane. From a huge condenser in the centre of the room a stream of sparks flew in every direction, completely enveloping Bradley Lane. No man on earth could stand such a discharge. Fighting against it Lane felt himself gripped by the force of thousands of volts. His energy waning he felt himself sinking into oblivion, but struggle as he would he could not withstand such a discharge.

Marnee, beneath the range of this diabolical contraption, gloated over the agony of his unfortunate victim when "Rat, tat, tat" on the door, accompanied by cries of "The Police are here" interrupted Marnee's enjoyment, but not before Lane lay insensible on the floor.

A hurried rush of feet overhead—the tramp of men descending the stairway and—

(A further instalment of this powerful story will appear in the next issue of "Radio.")

Coastal Radio Service

STAFF CHANGES.

Mr. R. C. Anderson, Radio telegraphist, Perth Radio, transferred to Adelaide Radio.

Mr. A. R. Finch, Rigger, on completion of overhaul of mast and aerial at Cooktown Radio, is returning to Melbourne. En route he will inspect the masts and aërials at Townsville, Rockhampton and Brisbane.

"BECO" Wireless Products

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Supplementary Price List Now Ready.

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Wireless Work on "St. Albans"

Between Australia, China and Japan

WIRELESS officers at sea have the opportunity of visiting many foreign lands and the route of the Eastern and Australian steamship *St. Albans* lies through some of the most beautiful and picturesque scenery to be seen on any voyage in the world. The vessel commences the voyage at Melbourne and calls at Sydney and Brisbane and thence proceeds inside the Great Barrier Reef along the Queensland coast through Torres Straits and the Malay Archipelago to Sandakan in British North Borneo, Manila in the Philippine Islands, thence to Hongkong and Japan—the Mecca of all tourists.

The voyage of the *St. Albans*, therefore, provides an opportunity of visiting some of the colonies of Great Britain and America, and of seeing a large variety of native races, including the Australian aboriginal, Malays, Filipinos and many others.

Wireless work on the *St. Albans* is exceedingly interesting. The transmitting apparatus consists of an Expanse standard $2\frac{1}{2}$ Kw. installation and the receiver used is an Expanse P1 tuning unit, which is very selective.

For adverse conditions such as the prevalence of atmospherics and jamming the run is considered to be one of the worst in the world, yet the *St. Albans* has worked traffic regularly on a wave-length of 600 metres up to a range of 2000 miles.

On the run from Australia to Japan the main stations worked are Melbourne, Sydney, Brisbane, Townsville, Thursday Island, Darwin, Sandakan, Manila, Hongkong, Woosung, Shanghai, Osezaki, Tsunoshima and many others.

Many Australian stations are held almost all the way up to Hongkong, and Time Signals from Adelaide are regularly received every night up to the equator, and at many times north of the meridian. Although the note of Adelaide radio is low, it can be read comfortably through interference.

The radio station at Sandakan is operated by Indians in charge of a European. The station is worked well and the operators handle traffic

in an excellent manner, although at times they have to work under difficulties, the situation of the station screening it from various points.

When approaching Manila after the run through the tropics, wireless work begins to get thick again. A fleet of American warships is stationed at Manila and the flagship issues instructions at most times by wireless telephone.

The principal American trans-Pacific lines are fitted with wireless

centre of intense jamming and suffers badly through atmospheric conditions for many months in the year, yet the station handles traffic in a very creditable manner.

Woosung and Shanghai handle a large amount of traffic, and work very harmoniously. The radio station at Shanghai issues a daily bulletin of news interspersed with musical items on a wave length of 250 metres. This has only just been introduced, and is for the benefit of ships at sea.



Mr. W. J. Washbourne, Chief Wireless Officer of the "St. Albans."

telephone installations and the voices of the operators are heard on the air regularly conversing with each other. The main station at Manila is Fort Mills, which handles all the commercial work which is done most efficiently. Also near Manila is located the big trans-ocean station at Cavite, which works direct with Honolulu and San Francisco handling all government and press messages. This station is well known to most wireless men throughout Australia who have listened in on long wave.

The radio station at Hongkong is situated in what might be termed the

The Japanese Coast stations work exceedingly well and great credit is due to them for the manner in which they handle foreign traffic.

The *St. Albans* carries three wireless operators, Mr. W. J. Washbourne, whose photo appears on this page, being at present in charge. Mr. Washbourne and his two assistants, Messrs. Robison and Coleman, have a most interesting time at their work and no doubt when this article is published they will earn the envy of many professional wireless men, as well as a host of experimenters in all parts of the world.

Wireless in W.A.

(By Our Special Correspondent.)

AT the second meeting of the Mount Lawley Radio Club, after the usual business had been transacted, Mr. A. E. Grey, a local experimenter, delivered a very interesting and instructive lecture on "Rectification and Amplification of Valves."

Mr. Grey was thanked by the President of the Club, Mr. B. M. Cavanagh, on behalf of the officers and members for his interesting address.

The Club holds a general meeting every alternate Friday, commencing at 8 p.m. In addition, buzzer classes for instruction in Morse telegraphy are held every Monday and Tuesday nights. Monday night is set apart for the advanced students from 15 words per minute upwards, and Tuesday night for the beginner.

Four members of the Club possess 1st Class Operators certificates, while six more intend submitting themselves for examination within two or three weeks.

Throughout the rough weather, the 71 and 68 foot masts in Almondbury Road, Mount Lawley, withstood the continued heavy blows, not even a stay having become loose or strained. These masts were erected on the Tabernacle system, that is, the mast itself is supported between two smaller and heavier ones, which not only facilitates erection, but also greatly strengthens the mast.

Mr. J. Scaddan, Minister for Mines, etc., and Honorary President

of the Mount Lawley Radio Club, has a six-valve "Radak" short wave set coming from America.

The Wireless Traders of Western Australia have intimated their intention of holding a demonstration and exhibition about Christmas time, and have written to the secretaries of the various clubs, requesting them to make the news known, and to prepare apparatus for exhibition.

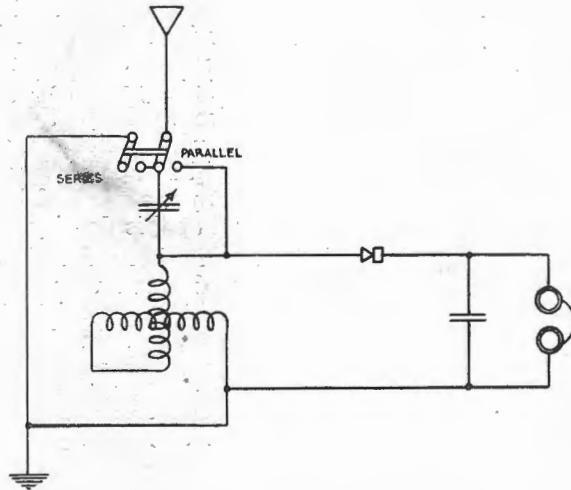
Mr. McKail, Commissioner of Sea Scouts for Western Australia, has decided to put up for sale his Short-wave Transmitter. Mr. McKail states that the set would be very suitable for club use, and placed it on view at Mr. Coxon's premises, King Street, Perth.

Considerable interest and admiration have been aroused during the last

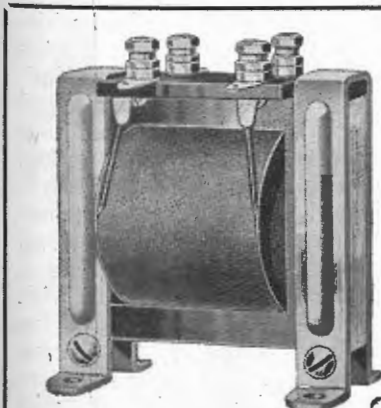
week over the short and long wave transmitter being built for the University of Western Australia by Mr. J. A. Wishaw, of the Wireless Supplies Company. Professor Ross, of the University, says he is more than pleased with the workmanship.

The number of big Perth firms exhibiting apparatus is daily increasing. Two big emporiums were added to the list of Radio importers within the last three weeks.

The envy of all wireless followers is Mr. B. Randell's apparatus at Beauforte Street, Mount Lawley. Mr. Randell is the assistant secretary of the Mount Lawley Radio Club, and is at present engaged constructing a seven-valve short and long wave set, which when, finished, should prove to be one of the best in the West.



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The Experimenters' Corner



THERE are many times during the experiments which are carried out in amateur wireless stations, that a small supply of alternating current at a low voltage would be very useful. Transformers are available on the experimental market which can be used for intermittent duty such as bell ringing and the running of toys, but when they are called upon to work con-

tremely small. The formula for calculating this voltage is as follows:— $V=4.44 \times F \times B \times T \times 10^{-8}$ (or $1/100,000,000$), where F =frequency, B =total lines of magnetic flux, and T =turns of wire on winding. If the flux density is worked in excess of about 60,000 lines per square inch for ordinary sheet steel or transformer iron the magnetising current, and heating of the iron laminations and winding will be high. It is good practice to keep this value about 50,000 when quiet and efficient operation will result. A loss of about half a watt per pound of iron can be expected at this density.

It has been found that the efficiency of small transformers such as are built in experimental workshops is about 90%. With a 50 watt transformer which will be chosen as the first example this allows of a loss of five watts which can be split up in equal proportions between the winding and the laminations. This means that the weight of the iron will be about five pounds, and as each cubic inch weighs 0.28 lbs. the cubic contents will be approximately 18 cubic inches. A suitable size for the core is one square inch cross section with an outside dimension of five by four inches, and an internal space of three by two inches. This will require a winding of 2200 turns, and as the total primary current will be less than half an ampere, No. 24 gauge wire can be safely used. Enamel insulation enables the winding to be put on in a minimum of space, and if it is wound evenly in layers with a thin sheet of oiled paper between each there need be little fear of a breakdown.

It is a simple matter to state off-hand that a certain number of turns should be wound on, but when the actual job is attempted it will be found

to have many difficulties unless former winding is used.

First of all, have the laminations cut so that they form a core of the desired size, and then plane up a piece of wood as shown by the letter "S" in Fig. A, so that it forms a square $3/16$ in. larger than the core. Round the corners off slightly so that the wire will not have to make too sharp a bend. This piece of wood

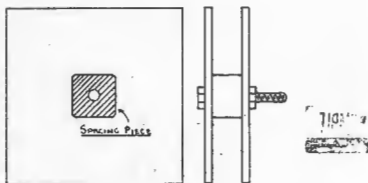


Fig. "A."

tinuously for filament lighting or battery charging they are very liable to overheat and burn out. It is a very simple matter to build transformers at home which will deliver sufficient current to meet all experimental requirements.

Before describing the practical details of the construction of transformers, a discussion of some of the theoretical points will be of great value to experimenters. The primary winding of a transformer consists of a coil of wire wound on a closed iron core which also supports a second winding known as the secondary. When an alternating current is passed through the former winding it generates a magnetic flux in the iron which reacts on the winding producing a back electro-motive force which is nearly equal to the applied value. If the proportions as regards turns of wire and flux density are properly chosen, the magnetising current to produce this back E.M.F. will be ex-

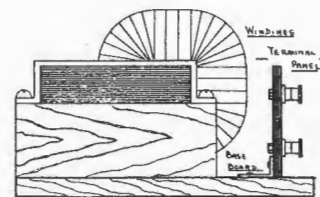


Fig. "B."

which is cut $1\frac{1}{2}$ in. long must have a $\frac{1}{4}$ in. hole drilled through its centre, and mounted between two end cheeks as shown. Cover the former with several layers of stout paper or light cardboard before putting on the wire so that the former can be forced out later on without injuring the insulation. After this lay several pieces of tape across the former for use in holding the winding in place while taping after its removal from the winding machine. The primary winding will consist of 44 layers of 50 turns of No. 24 enamel covered copper wire. The secondary is wound on the same size former as the primary, but with a ratio of turns corresponding to the change in voltage desired. Supposing that a ten-volt winding is required for use in connection with the filament lighting of a bank of five watt Radiotrons, ninety-two turns will be required. If two valves are to be operated in parallel this will require an output of approximately

five amperes. A conductor equivalent to No. 16 gauge will carry this current with a big margin of safety. Other voltage windings can be put on if consideration is taken of the space available, and the current that will be used. Double cotton covered wire can be used for the secondary. Both windings are assembled on the same side of the core after they have been taped with half inch linen tape and varnished. The mounting can be either horizontal or vertical, and suggestions for each method are given in Fig. B and C.

Another useful transformer is one which is capable of delivering about 600 volts to a set of valve rectifiers. This requires a special secondary with a potential of 1200 volts between the outer wires. With the primary previously specified, this voltage will require 13,200 turns or 6600 per section. Allowing a width of half an inch for each section and space for insulation between layers of No. 36 enamel can be used. To fit into the space available 120 layers of 55 turns each will have to be wound on. The insulation between the layers should consist of the thinnest white paper available, and to improve its dielectric strength it should be cut into strips of the desired size and dipped into a weak solution of shellac and dried thoroughly before being put into use. As the voltage at the terminals of these coils will be very high they must be carefully insulated and for this purpose Empire Cloth half inch tape is very suitable instead of

plain linen. Place these windings on the core so that the high potential ends come on the outside, and the inner terminals form the low potential centre tap which is usually at earth potential. The portion of the core which accommodates the windings should be covered with several layers of Empire Cloth for insulation, and the other legs bound in the centres to prevent the laminations from chattering. Thin sheet iron of No. 28

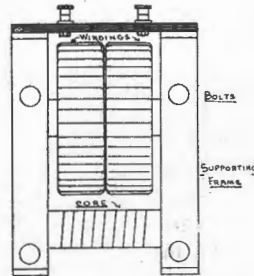


Fig. "C."

gauge gives a lamination with a thickness of about 16 mils, and from this figure it will be an easy matter to calculate the quantity of material required. When small quantities of iron are required sufficient can often be obtained by cutting up an 0' benzine or kerosene tin and burning off the tin coating by annealing in a fire. This source provides a good quality steel with a thickness of about 12 mils. All laminations should be coated with a layer of thin varnish to keep down eddy current losses and prevent rusting.

LETTER TO THE EDITOR.

The Editor,
"Radio."
Dear Sir,—

I will be glad if you will give publicity to the subject matter of this letter as it appears to be one of considerable importance in the interests of successful broadcasting. As you are aware, we have recently decided to closely restrict the use of regenerative circuits with the object of eliminating the interference which would otherwise result when broadcasting becomes established. Unfortunately, I am led to believe a number of dealers are selling regenerative receivers, and probably some of these sets are sold to people who are unaware of the possibility of trouble to others that may be caused.

I am sure it will be necessary only to remind dealers who may be thus thoughtlessly sowing the seeds of discord to have the necessary action taken with their staffs to prevent the sale of regenerative receivers capable of causing the aerial to oscillate; and also to explain to enquirers that such classes of receivers will not be licensed for broadcasting or experimental reception in closely settled areas. This restriction on the use of receivers will certainly not be welcome to some experimenters, but with the advent of Broadcasting we must consider the greatest good for the greatest number where we can do so without undue hardship.

Yours faithfully,
(Signed) J. MALONE,
Chief Manager Telegraphs and
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Queensland Activities

(By Our Special Correspondent.)

OF outstanding interest to the radio world of Queensland—and indeed of Australia—was the recent achievement of Dr. Val McDowall (4CM, Brisbane) in reaching Gisborne (N.Z.) with his broadcast on Saturday night, August 25. He had previously received a relayed radio inquiry from Mr. Ivan H. O'Meara (2AC, Gisborne) asking that a reciprocal system of experiments be undertaken between them, and on that night the first move was made. Mr. O'Meara has since reported that he picked up 4CM's "Hello New Zealand" clearly and distinctly. "The voice was perfectly good," he has written, "and the modulation perfect." The next step will be attempted in the near future, namely, the receipt in Brisbane of 2AC's message. The work of Dr. McDowall has long since been recognised in Brisbane, but this—his latest achievement—must surely rank as a record.

The newly-formed New Farm Radio Club continues with unabated vigour, and under the capable secretaryship of Mr. W. A. Langford, who is aided by an enthusiastic band of about 26 licensed amateurs, considerable progress has been made. Large aerial poles have been secured, and negotiations are now proceeding for the purchase of a centrally-situated block of land on which to erect a club house. At present the great handicap is lack of accommodation, and operations are restricted to "buzzer" classes every Sunday morning, and private experimenting, but when the proposed club house becomes an established fact, it is hoped that a course of lectures and public demonstrations will be instituted.

The Y.M.C.A. club reports good progress with their newly-installed broadcasting set. Concerts have been held regularly, and good results have been obtained.

In the country similar activity prevails. Maryborough Club is energetically concentrating on "buzzer" practice in the time the members can spare from the construction of their sets—of which there are a consider-

able number—and comprehensive experiments are promised when they get fully into their stride. Gympie is situated in a somewhat similar position, and Secretary N. McCoy reports an appreciable increase in membership.

The affairs of the Radio Relay League are as yet mainly in the embryo stage, the main business to date



Another Radio Hat! This is called "The 'Phone' Style.

being the consideration of the rules and constitution, and the question of admitting non-licensed amateurs to membership. It is feared that operations will be hampered slightly by a lack of licensed transmitting sets in the country districts, owing to Queensland's widely-scattered centres, but the support of five or six stations appears to be assured.

The Institute of Radio Engineers (Queensland) has inaugurated a series of lectures, the first of which was

delivered by Mr. T. W. Bridger, A.M.I., E.E. (President), the subject being: "Radio Operation as Applied to Aeroplanes in Military Field Work." At the second meeting Mr. C. E. Sanderecock addressed a large and appreciative gathering of members on "The Principles of Capacity and Inductance."

It is proposed at some future date to discuss the subject in greater detail, with special reference to radio application, especially selectivity. The Institute also has in hand a number of special experiments which will be open for discussion at future meetings.

It is officially announced that Mr. T. W. Bridger, President of the Radio Institute, has been appointed Honorary Radio Inspector for Queensland, outside the metropolitan area.

An excellent broadcast concert was given from the experimental station of Dr. Val McDowall (4CM) on Sunday evening, September 30, in conjunction with the Brisbane *Daily Mail*.

An attractive programme was prepared by Mr. Eric John, and consisted of vocal items by Queensland's most distinguished artists, assisted by Walter Kirby, the famous Australian tenor, who sang into the microphone for the first time in Australia.

Owners of all receiving stations in Queensland were "listening in" and in addition to the excellent reports they furnished, word also came from all over the Commonwealth and even New Zealand, stating that the concert had been received and enjoyed.

Previously, Dr. McDowall's programmes had been heard at one station in Gisborne (N.Z.), but on September 30 two N.Z. stations advised having heard it. Melbourne, Sydney and Sheffield (Tas.) also reported similar gratifying results.

At the Toombul Show Ground Mr. J. C. Price, of Wireless House, Brisbane, was in charge of a six-valve receiving set equipped with a Magnavox, and 600 people assembled in the hall heard and enjoyed every item.

Walter Kirby was supported by Miss Hilda Lane, Eric John, Roy Mannion, E. Crosier, H. Scott McCallum and W. S. Drover. The broadcasting arrangements were under the capable supervision of Messrs. Elliott and Clark, who received numerous messages of appreciation from grateful "listeners in."

The New Farm Radio Club installed an Amplion "loud speaker" in their premises for the occasion and issued invitations to the residents of the district. A large number accepted and enjoyed the entertainment.

A GOOD PERFORMANCE.

Mr. A. E. Dillon, secretary of the Institute of Radio Engineers, achieved a good performance one evening recently. Using 2 watts his message, transmitted from the Institute Rooms, was picked up by S. Winton at Ascot, who repeated it to him over the land line. Mr. Dillon, who is an enthusiast of the first water, has accepted an invitation by the Master of the Grammar School to lecture to the senior students at the school on modern radio developments. It is probable that in the near future a receiving set will be installed at the school for the use of students interested in radio research.

RADIO EXHIBIT.

At the Toombul Agricultural Show on September 30 a wireless telephony demonstration was given by Mr. J. C. Price in conjunction with the exhibit of radio apparatus.

Twelve entries were received for the exhibit, and some of the work showed considerable skill and ingenuity.

RELAY LEAGUE.

Mr. W. Finney, radio inspector for the Metropolitan area, is once more

taking an interest in the Radio Relay League, which is showing signs of rejuvenation.

Newcastle "Makes Good"

Local Experimenters Commence Transmitting

Newcastle experimenters have for some time been determined to make "listeners-in" in their district independent of the programmes broadcasted from the experimental stations around Sydney.

This very laudable aim was realised quite recently when two stations in the district carried out transmission tests, during which some high-class musical items were radiated.

On Saturday, September 29, Mr. N. P. Olsen transmitted between 7.45 and 10.30 p.m., the music being supplied by his Gulbrandsen Duo-Concerto Player piano and gramophone.

Reports received from stations within a 150 mile radius and from several in Victoria were to the effect that the transmission was highly creditable.

On the following night, September 30, the Newcastle District Radio Club carried out its first transmission test and achieved great success. This was particularly gratifying in view of the fact that the set was built by the Club members.

During the evening successful two-way conversation was carried out with Mr. N. P. Olsen, of Waratah.

The Newcastle radio club was formed only 12 months ago and the set was built within the last few months. In view of the financial difficulties that have had to be overcome, the results achieved are a credit to the Club and district.

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Victorian Doings

(By our Special Correspondent.)

RADIO is creating interest among quite a large number of Councils, entertainment committees and the Clergy in Melbourne. The task of "delivering the goods" devolves, of course, upon the experimenter. In two churches, at least, ministers have declared their intention of broadcasting a sermon but are lacking just the necessary nerve to launch upon an apparently stormy sea of precedent. Radio is awaiting to bend the waves into many a hamlet and mansion far removed from the pulpit. However, we are still "listening in" for the footfall of the pilgrim.

At the instigation of the Central Education Council of the Wireless Institute, members are to be accorded a series of lectures by prominent men from the University. These addresses will be given at the Natural Philosophy School at the University upon subjects directly and indirectly connected with radio. Members should avail themselves of this excellent opportunity to acquire an academic insight into the many absorbing subjects listed.

The Institute furnishes the following list:—

October 30: Professor Laby—"Electricity from Hot Bodies."

close to the "loud speaker" was "terrific" the absorption caused by so many "body effects" considerably damped the music at the far end of the room. This is a condition worthy of notice by organisers of similar functions. Mr. Magrath intends using a second "speaker" upon other occasions at a far corner of the room. Perhaps a better method and a saving of apparatus would be to raise the "loud speaker" above the heads of the guests. The musical strains encounter too many obstacles if they are projected on a near level. Balconies should be availed of for this purpose.

Messrs. Magrath and Marcard wish to thank 3JU and 3DP for their transmissions, also Messrs. Norris & S. Nelley for the loan of a Western Electric Loud Speaker, and Messrs. Myers, Limited, for the loan of a 3-valve amplifier. Disc valves were used.

Recently added to the list of transmitters is the station of Mr. K. Barbour, 1 Irving Avenue, Armadale (Vic.). Preferring to add to his knowledge and to await conditions when neatness and order and not a conglomeration of wires and twisted contacts induces efficiency, this experimenter will go far in both reception and transmission. Various stations appeared to be seeking him out one Sunday night recently, when a number of A.C. rectifiers and microphones seemed to be out of order. For two hours he gave reports and considerably assisted those in trouble. To locate a station who will cheerfully sit in while adjustments are made is indicative of the camaraderie not to be lost in experimental circles. Mr. Barbour's call is 3ZI.

At the moment of writing, the average number of entrants for the coming Trans-Pacific Test is 10 per club. Quite a large number of stations are closed down for alterations, and it is to be hoped that "reactionists" are absent.

CALLS HEARD.

3BD has heard: 5AG, 5AH, 2DS, 3AA, 4AA, 2FA.

3DX has heard: 2DS, 2GR.

3BY: has heard: 2DS.



Miss Pola Negri, Paramount Star, is an ardent radio fan.

The Flower Show at the new Memorial Hall, Canterbury, was graced by the presence of Radio on Tuesday, September 4. The Canterbury Radio Club provided the entertainment, and the event was well organised and carried out. Mr. G. S. Dohrmann (3AM) was in charge of transmitting, while the receiving set was operated by Mr. J. C. Fitchett (3BL). The attitude of a number of the older people upon hearing music transmitted by wireless for the first time was decidedly interesting. Genuine astonishment was first engraven upon every face, then smiles beamed, and became as the blooms gathered around. It was a highly successful evening for radio amid ideal surroundings.

November 27: Dr. Lovè (Professor of Light and Sound)—"Wave Motion."

The lectures will be demonstrated by experiments which will, of course, lend additional interest.

Further insight into the possibilities of home radio was furnished by Mr. F. F. Marcard, at 79 Alma Road, St. Kilda, on Saturday, September 15. A spacious room provided for the reception of sixty-five couples, and the dance portion was thoroughly enjoyed by the guests whose enthusiasm was greatly enhanced by the novelty of Radio music.

Mr. J. Magrath, who was in charge of the receiving apparatus, found that although the volume of sound

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Mr. J. F. McGinley signed off s.s. *Bakara*, at Sydney, on August 15, and signed on s.s. *Australmount* on the same date.

Mr. C. F. G. Taylor was relieved by Mr. A. Webster on s.s. *Ngaio*, at Wellington, on August 13, and proceeded on sick leave.

Mr. T. Bannister signed off s.s. *Hexham*, at Newcastle on August 19.

Mr. S. Haworth signed off s.s. *Bakara*, at Sydney, on August 20, and signed on s.s. *Hexham*, at Newcastle, on August 21.

Mr. T. O. Sexton signed off s.s. *Bakara*, at Sydney, on August 20, and signed on s.s. *Urilla* on the same date.

Mr. H. R. Allen relieved Mr. H. F. Harman on s.s. *Hobson's Bay* as Senior Operator on August 20.

Mr. H. F. Harman relieved Mr. J. Doggett on s.s. *Aldinga*, at Sydney, on August 20.

Mr. E. D. Nicholl signed off s.s. *Eastern*, at Sydney, on August 20, and signed on s.s. *Hobson's Bay*, same date.

Mr. R. L. Beatty signed off s.s. *Eastern*, at Brisbane, on August 18.

Mr. J. Doggett signed on s.s. *Bakara* as Senior Operator at Sydney on August 20.

Mr. F. R. Snape signed on s.s. *Hobson's Bay* as 3rd Operator, at Sydney, on September 21.

Mr. E. D. Nicholl signed on s.s. *Bakara* as 3rd Operator, at Sydney, on September 21.

Mr. G. Gormlie rejoined s.s. *Arahura*, at Auckland, on September 17.

Mr. J. G. Henderson signed off s.s. *Arahura*, at Auckland, on September 17, and relieved Mr. E. A. Hunter on s.s. *Wingatui* on the same date. Mr. Hunter proceeded on Home Port leave.

Mr. Lloyd Jones signed on s.s. *Dongarra*, in U.K. Port as 3rd Operator.

Mr. A. J. Costa relieved Mr. A. V. Middleton on s.s. *Dilkera*, at Port Kembla on September 27.

Mr. F. N. Toohey signed on s.s. *Bakara* as 3rd Operator, at Melbourne, on September 25.

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Record 2. One Side.—A Press message sent at a speed of approximately 10 words per minute. *Reverse.*—A similar message at a speed of 50 per cent. faster.

Record 3. Both Sides.—Dummy messages, properly numbered, timed and counted, as exchanged between ships and stations and *vice versa*.

Record 4. One Side.—Difficult business message, containing figures, fractions, Stock Exchange terms, etc.; one or two mistakes have been introduced and then corrected in the accepted style. *Reverse.*—Code words and cipher transmitted at a normal rate of 20 words per minute.

Record 5. One Side.—Various messages such as would be met with in an ordinary day's transmission, sent at the rate of 25 words per minute. *Reverse.*—Messages in French, Spanish and Italian.

Record 6. One Side.—Signals from two distinct transmitters on different notes; Press message transmitted at 25 words per minute jammed by similar matter at slower speed. *Reverse.*—Mixed messages jammed by Press messages.

SERIES II. Record 1. One Side.—Morse Code, including full figures, abbreviated figures, and punctuation signs, as printed in the Postmaster-General's Handbook (Sounder Record). *Reverse.*—Simple Press, sent slowly (Sounder Record).

Record 2. One Side.—Italian Press, 25 words per minute. *Reverse.*—French Press, 25 words per minute.

Record 3. One Side.—Spanish Press, 25 words per minute. *Reverse.*—Portuguese Press, 25 words per minute.

Record 4. One Side.—Figures and fractions at moderate speed. *Reverse.*—Poldhu Press, with interruptions by voices, whistles, and various noises, to teach the reception of signals in conditions of difficulty from interruption.

Record 5. One Side.—"Distress Record" in which two ships working are interrupted by a third which sends the SOS signal. The traffic of the ship in distress is then expeditiously handled. This is a very dramatic record, exactly reproducing the wireless conditions at sea when a cry of distress is sent out. *Reverse.*—Ship and shore working with correct "T.R.s" and properly coded messages.

Record 6. One Side.—Messages from ship to shore at 25 words per minute, with jamming from French Press. *Reverse.*—Messages from shore to ship at 25 words per minute, jammed by similar Press.

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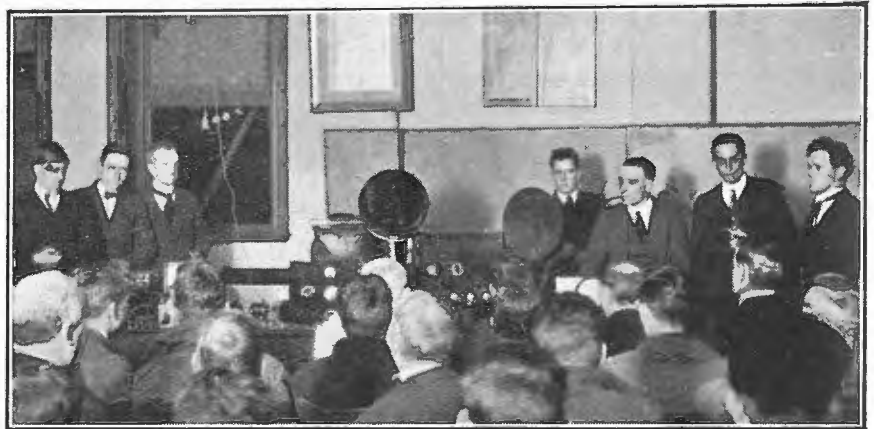
Final Report

The following final report of the N.Z. amateur radio test is supplied by signal strength of N.S.W. transmitters heard in N.Z. during the N.S.W. the Hon. Organising Secretary, Mr. D. G. McIntyre.

Date.	Call.	Signal Strengths Speech.	CW	Remarks.
Aug. 4	2JM	1	2	QRM from ship stations.
Aug. 5	2CM	5	5	CW and 'phone O.K.
Aug. 6	Nil	—	—	
Aug. 7	2BB	—	8	Sigs. clear. Missed parts of message sent IXX at times.
Aug. 8	2DS	4	4	CW readable 50ft. from loud talker both 'phone and CW messages received O.K., slight fading.
Aug. 9	2ER	3	3	No message received; 'phone per cent. low. Also bad hum.
Aug. 10	2KC	1	2	Compensating wave very noticeable.
Aug. 11	2JM	—	3	QRN very bad.
Aug. 12	2CM	5	5	Excellent all-round transmission.
Aug. 13	2KC	1	3	Compensating wave difficult to tune out.
Aug. 14	2BB	—	2	Note varied considerably. Wave swinging. Gale here (in N.Z.).
Aug. 15	Nil	—	—	
Aug. 16	2ER	—	3	'Phone per cent. low and bad hum.
Aug. 17	2DS	1	3	QRN and QRM very bad.
Aug. 18	2JM	—	2	QRN.

Another station was heard but by only one N.Z. station, which did not furnish full data. On the two nights marked nil, 2DS unofficially worked 3AA and 4AA.

Demonstration at Manly



Mr. Raymond McIntosh recently gave a highly successful demonstration of radio telephony before members of the Manly Radio Club. During the evening he carried out two-way telephony conversation with Mr. J. S. Marks (2GR), of Rose Bay. The figures at the back, reading left to right, are:—Mr. F. C. Swinburne (President Manly Club), M. J. McCarthy, W. J. S. Perdriau (Sec. Manly Club), —fifth figure Mr. Mason, Mr. F. Clark and Mr. Raymond McIntosh.

Club Notes & News



WIRELESS INSTITUTE OF S.A.

The following officers were elected at the fifth annual meeting of the South Australian Division of W.I.A.:—President, Mr. Caldwell; Vice-presidents, Messrs. J. Honor and Austin; Treasurer, Mr. Milne; Secretary, Mr. Ames; Assistant Secretary, Mr. Earle; Librarian, Mr. Hawke; Council, Messrs. Jones, Morris, Randle and Bland.

Ten applications for membership were received and approved.

The secretary was instructed to call a meeting of holders of transmitting licenses with a view to forming a branch of the Radio Relay League.

An addition of 2/6 and 1/- respectively was made in the entrance fees to be charged to applicants for full and probationary membership.

WAVERLEY RADIO CLUB.

It was decided at a recent meeting that as no reply had been received from the Metropolitan, Wentworth or Manly Radio Clubs regarding an inter-club debate, the matter should be allowed to lapse for the time being.

The Croydon and North Sydney Clubs will now be approached in an effort to arrange debates.

Satisfactory progress was reported in regard to the Club's transmitting set.

The election of officers resulted as follows:—President, Mr. M. Perry; Committee, Messrs. E. Bowman, R. Howell, J. Marsland, G. Thomson, T. Nott and G.

Tatham. The committee will elect the vice-presidents, secretary and treasurer from its ranks at an early date.

The State Radio Inspector advised that in all probability the Club's wave-length would be 245 metres.

ESSENDON RADIO CLUB.

On September 20 a successful demonstration of wireless telephony was given before a large gathering of members.

The reception arrangements were supervised by Mr. M. Chaffer, who operated a 4-valve receiver. The programme was transmitted by Mr. N. Culliver (3DP) and was, as usual, of a high standard.

The Club now possesses a fine aerial 40ft. high by 66ft. long and receiving apparatus will soon be installed.

The secretary's address is J. W. Jacobs, 40 Munro Street, Ascot Vale (Vic.).

ILLAWARRA RADIO CLUB.

The business at the 31st general meeting consisted of "Questions." Members benefited considerably by the information thus obtained.

At the following meeting on September 25 a lecture was given by Messrs. F. H. Kirkby and S. Atkinson on "The Principles of Transmission and Reception." Later in the evening they gave a practical demonstration of transmission and reception by means of two small loop aerials representing the two stations.

The lecture was the most practical and instructive yet given before the Club.

Club members paid a visit of inspection to Mr. A. B. Hector's laboratory at Greenwich last month and quite enjoyed the experience.

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

THE NEUTRAL BAY RADIO CLUB.

This club held a very successful meeting at Manresa Hall, North Sydney, on October 2. Members of the various clubs in North Sydney were invited to attend, and Mr. S. E. Tatham, President of the Neutral Bay Club opened the meeting with a very good attendance.

Mr. George A. Taylor, President of the Association for Developing Wireless in Australia, New Zealand and Fiji, and Chairman of the recent Broadcasting Conference in Melbourne, delivered an intensely interesting lecture, assisted by lantern slides, on Wireless and the peace of the world. A complete report of Mr. Taylor's lecture appears elsewhere in this issue.

By special permission of the Postmaster-General and the Controller of Wireless, Mr. Raymond MacIntosh, Vice-President of the North Sydney Radio Club, gave a practical demonstration of two-way wireless telephony in conjunction with Mr. J. S. Marks (2GR) whose experimental station is at Rose Bay.

Mr. Phil Renshaw, Honorary Secretary of the Wireless Institute of Australia, spoke regarding club activities, and complimented the Neutral Bay Radio Club on inviting members from other clubs to attend their meetings. He considered this was a very excellent idea, and one that should be followed by other clubs.

The next meeting dates of the Neutral Bay Radio Club are: October 16 and 30 respectively at 180 Kurraba Road, Neutral Bay.

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Wireless in the Dominion

(By Our Special N.Z. Correspondent.)

THE erection of broadcasting stations in all the principal towns in New Zealand has led to a great increase in the number of amateur wireless operators.

A new broadcasting station is to be started in Auckland shortly under the supervision of Mr. Pearson, Managing Director of the La Gloria Gramophone Company. The transmission is to be on Saturdays and Mondays from 8 to 10 p.m. and on Sunday from 8.30 and 10 p.m. On week days records of classical music only will be broadcasted, whilst on Sunday evenings sacred items will be given, interspersed, if possible, with short addresses by ministers of religion.

The transmission of the Hamilton Radio Club on Saturday evenings is heard throughout the Island and is most popular.

Australian stations afford considerable entertainment to New Zealand listeners—the principal being 2GR (Mr. Marks, Rose Bay, Sydney), and 2CM (Mr. Maclurcan). Amateurs are looking forward to the time when Farmer and Company's station will be in operation, as it is expected that their programme will be heard all over the Dominion without any difficulty.

Tokomaru Bay can claim to be the first library in New Zealand to instal a wireless telephone receiving set for the benefit of its members. Mr. T. F. Wilkinson is supervising the set,

which is so far able to pick up all the main centres as far as Dunedin.

Quail Island Lepers have been provided with a wireless set which has been erected by the Post and Telegraph Department, and the patients now regard it as one of their most popular forms of recreation.

The pleasure and entertainment afforded by a wireless set was dilated upon by Mr. W. Shrimpton, Chief Telegraph Engineer, at the Rotary Club luncheon in Wellington recently.

Mr. Shrimpton stated that there were now between 3000 and 4000 receiving licenses in New Zealand mostly held by boys, who listened to the broadcasting of music and whatever else they could pick up. He urged the boys to learn Morse and get a transmitting license, thus enabling them to speak to other stations in New Zealand. He pointed out that a perfectly good wireless set could be obtained for about £5, which would enable anyone to communicate with ships in the Pacific, and with New Zealand stations, besides picking up all broadcasting.

Following his address, Mr. Shrimpton caused a super-sensitive receiving apparatus to be operated, and selections played on top of a buildings in Courtney Place were perfectly audible.

Several Southern experimenters with efficient receiving sets have been

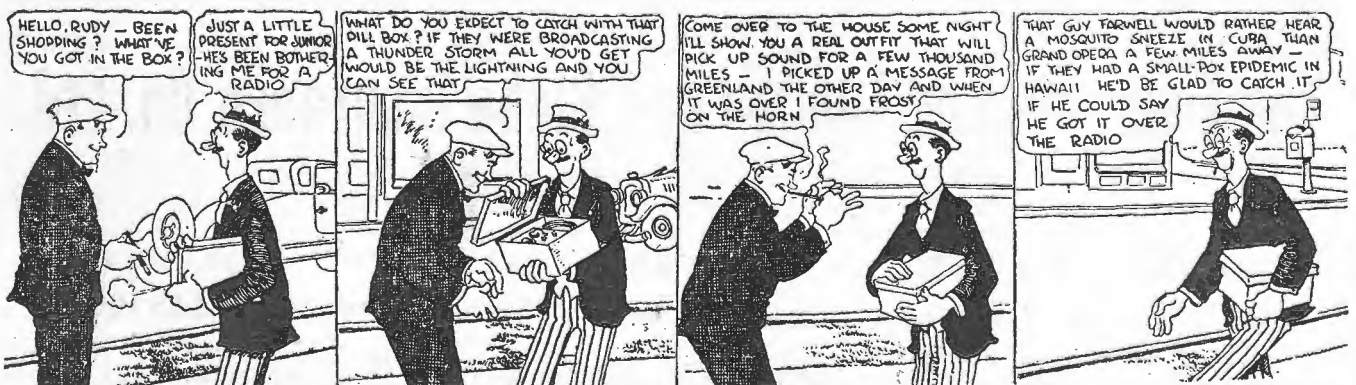
successful in hearing the items broadcasted by a Los Angeles station (KGI). In one instance Mr. W. Ward, of Taraki, accomplished the feat of "logging" almost a complete programme. Mr. Ward stated that he hears this broadcast every evening under favourable conditions fairly loudly, and with perfect distinctness. He possesses a four-valve set. The transmission may be heard every evening up to 6.30 p.m. and sometimes 7.30 (Thursdays).

Probably the first case in the Dominion where radio has been used to summon relatives to the bedside of a man lying seriously ill in hospital occurred in Wellington one Sunday evening recently. The locality with which it was desired to get in touch was connected only by a telephone bureau which opens on Sunday between 9 and 11 a.m., and it was impossible to get in communication with the persons wanted. The Dominion Radio Co. was approached, and advised that the person in question owned a wireless set and if he happened to be "listening in" would receive the message. This was transmitted at intervals during the evening and reached the party for whom it was intended. Several amateur "listeners in" said the message came in clearly and distinctly.

The incident proves in a striking manner the value of Radio in isolated areas.

Distance Lends Enchantment!

By Sol Hess



-San Francisco Examiner

Grafton Enthusiasts Form a Club

Bright Future Predicted

THOSE who consider that all the interest and enthusiasm in radio research is confined to the big cities will be agreeably surprised to learn that there are experimenters in practically every country centre whose enthusiasm is not one whit less keen than the most inveterate wireless worker around Sydney.

This is particularly so in the Grafton district, where quite a number of experimenters make no secret of the fact that they are frequently "listening in" as early as 3 a.m. They sometimes forget to add that they have been sitting up all night.

On Tuesday evening, Sept. 25, a large number of these men assembled at the business premises of Mr. George L. Urquhart, Prince Street, Grafton, for the purpose of forming a club.

Those present included Mr. G. L. Urquhart, Mr. H. Marks, principal of the Grafton Experiment Farm, Mr. B. Campbell, Mr. J. M. Retallick and Mr. A. J. Firth.

After a brief explanation by Mr. M. Dixon of the wireless position generally, Mr. G. L. Urquhart moved that a radio club be formed in Grafton.

Mr. Urquhart stressed the value such a club would be to experimenters and the district generally, and offered financial assistance and the use of a room to hold meetings in order to set the ball rolling.

Mr. Marks, in seconding the resolution, said he was convinced there

were sufficient experimenters in the Grafton district to form a highly successful club. Similar sentiments were voiced by Messrs. T. R. Willmott and J. M. Retallick, and the resolution was carried unanimously.

The following officers were elected: President, Mr. G. L. Urquhart; Secretary, Mr. A. J. Firth; Treasurer, Mr. J. M. Retallick; Committee, Messrs. B. Campbell, J. Woods and A. Osborne.

Consideration of the rules and other matters incidental to the formation of the club were deferred till a later date.

There is every reason to believe that the club will prove an immediate success. The various office holders are keen and experienced amateurs, and intend devoting their energies to enrolling every radio enthusiast in the district as a club member.

The President, Mr. Urquhart, is known and respected throughout the district and will prove a tower of strength to the club.

Mr. Willmott has a highly efficient station about seven miles out of South Grafton, and being an old member of the Wireless Institute is, of course, a capable experimenter.

Mr. Retallick has also carried out some highly creditable wireless work as have several others whose names do not occur at the moment of writing.

Radio wishes the Grafton Club every success.

Radio Concert on Sydney Harbour.

The Metropolitan Radio Club, ever alive to the value of social functions as a means of bringing radio experimenters together has arranged a novel outing for the evening of October 20. This will take the form of an excursion on Sydney Harbour. The launch will carry a wireless receiving set and arrangements are being made for several experimental stations around Sydney to transmit entertainment programmes during the evening.

It is a well-known fact that music is heard to the greatest advantage on

the water, where there is an entire absence of sounds which usually militate so much against its enjoyment on land.

It will be interesting to note the success of this first wireless concert to be given on Sydney Harbour.

Those behind the enterprise are confident, and with the Metropolitan Radio Club's well-known reputation for doing things well, the entertainment should be a great success.

Tickets at 2/- each are obtainable from the Treasurer, Royal Arcade, Sydney.

The Wireless Book YOU Want!

You want a complete and scientifically accurate book, and, at the same time, one that you can read with ease.

Your book must be written in non-mathematical language and cover both theory and practice. Here it is:—

Wireless Telegraphy

By Rupert Stanley, B.A., M.I.E.E.

Chevalier of the Legion of Honour.
Fellow of the Inst. of Radio Engineers,
Late Chief Wireless Instructor in the
B.E.F., France.

ABRIDGED CONTENTS:—The Earth, the Atmosphere, and the Ether, Matter and Electricity. Charged Bodies and Electric Strains in the Ether. Magnetism and Magnetic Strains in the Ether. Electric Measurements and Calculations. Capacity Effects—Condensers. Induction Effects. Induction Coils, Alternators and Transformers. Oscillatory Discharges. Historical Development of Radio-Telegraphy. Coupling of Circuit. How Ether Waves are Propagated. Transmitter Circuits for Spark Systems. Transmitting Apparatus. Synchronous, Asynchronous, and Resonance Sparking-Faults in Transmitters. Aerials, Insulators, and Earth Connections. Receiver Circuits. Detectors and Telephone Receivers. Receivers for Spark Systems. Systems Employing Undamped or Slightly Damped Waves. Miscellaneous Apparatus. Some Measurements in Radio-Telegraphy. Secondary Cells and Batteries. Electrons. Theory of the Hard Valve. Valve Detectors and Detector-Relays. High Frequency Amplification. The Valve as a Generator of Oscillations. Low Frequency Amplifiers. High Frequency Amplifiers. Heterodyning-Sensitiveness of Valve Reception. The Characteristics of the French Valve. Design and Characteristics of Various Receiver Valves. Special Valve Designs and Characteristics. Continuous Wave Transmission. C.W. and Wireless Telephony Transmitters. C.W. and Radio-Telephony Reception. The Development of Radio-Telephony. Modern Valve Apparatus. Earth Current Signalling. Miscellaneous Valve Apparatus and Applications. Index

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ASK YOUR QUESTIONS THROUGH "RADIO."

In order that all concerned might know just where to look for information regarding knotty points in the Broadcasting Regulations "Radio" has made arrangements to furnish information to all enquirers who submit pertinent questions.

A cordial invitation is now extended to all and sundry to seek enlightenment on any point they are doubtful about, through "Radio."

All enquiries will be answered promptly through the columns of this magazine.

"Wireless House" Social Club

The "Wireless House" Social Club held a dance and social on Wednesday, September 26, at the Oxford Hall, Sydney, practically every member of the Sydney staff of Amalgamated Wireless (A/sia.) Limited being present at the gay and sociable gathering.

A full jazz band was in attendance and provided irresistible dance music. Early in the evening very attractive Jazz caps—made by the young ladies of "Wireless House"—were distributed.

At supper time, Mr. F. W. Larkins, Chief Accountant of the Company, presented Mr. G. P. Atkinson with a cheque and fountain pen as a mark of the esteem in which he was held by the staff during his association with the Company. Mr. Atkinson, who recently resigned from the staff, in responding, very cordially thanked Mr. Larkins and those present for the honour that they had conferred on him and, although he was very sorry

to sever his connection with the Company he would always value the friendships that he had made during his association with them.

Dancing continued until a late hour, and among those present were six of the Company's wireless operators from ships in port.

The committee of the social club is to be heartily congratulated on the success of the function, everything going off smoothly, which demonstrated the energy and enthusiasm that was necessary in making all the splendid arrangements.

Successful Students

At the August, 1923, examination for a certificate of proficiency in Wireless Telegraphy, Messrs. E. M. Hooper and S. A. Halahan, students of the Marconi School of Wireless in Melbourne, were successful in obtaining passes.

Radio at Gilgandra

Successful Entertainment

The public of Gilgandra evinced the greatest possible interest in a lecture on the "Wonders of Wireless" and a demonstration of radio telegraphy on the evening of September 15.

The entertainment was held under the auspices of the Parents and Citizen's Association and the lecturer and demonstrator was Mr. H. A. Warden, an experimenter of well over 12 years' experience.

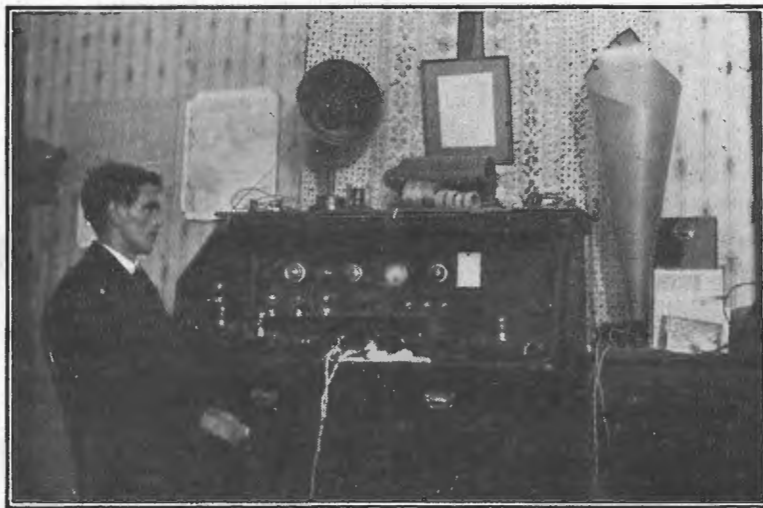
The first part of the lecture was devoted to an historical sketch of wireless. Later, Mr. Warden touched on the present-day position and explained many points in connection with the Australian Broadcasting regulations. He emphasised the great boon broadcasting will be to country people, and pointed out that the purchase of a suitable receiving set will be an easy and comparatively inexpensive matter, and its operation equally simple.

At the conclusion of the lecture a demonstration of wireless telegraphy was given. By means of a 5-valve set and a Brown's "Loud Speaker" signals from spark stations up to 1000 miles away were audible throughout the entire hall, which it might be mentioned, accommodated well over 200 people.

The demonstration was held by permission of the Controller of Wireless and the condition of secrecy regarding the messages heard was strictly observed.

MR. WARDEN—ENTHUSIAST.

Mr. H. A. Warden, who was responsible for the lecture and demonstration, is well and favourably known in wireless circles in Sydney. He is a member of the N.S.W. Division of the Wireless Institute of Australia. The fact that he has charge of the Gilgandra Public School with a roll of over 300 pupils indicates that he has very little leisure time for wireless work, but despite this he has accomplished some useful work. Victorian and South Australian experimenters are regularly "logged" and telephony from New Zealand stations comes in clearly on his set.



Mr. C. W. Slade and his experimental station (2SX) at Croydon, N.S.W..



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Queries Answered



N. A. F. (Mount Mulligan) asks make of resistance wire, also resistance per 100 yards and current carrying capacity (sample submitted).

Answer: No. 18 B and S (American) nichrome wire. The resistance per 100 yards is 110 ohms. at 65 deg. F. A current of 3.2 amperes heats it to the boiling point of water, and 9 amperes to a dull red heat.

L. E. S. (Mosman) asks: (1) How to find wave-length of aerial (particulars submitted). (2) How to find wave-length of inductance coil.

Answer: (1) The approximate natural wave-length of an aerial is 4.5 times the total length from the far end of the aerial to the earth connection. (2) Shunt it with a condenser of known value, and measuring the wave-length it generates when excited by a shunted buzzer, calculate

it from the formula $WL=1885\sqrt{LC}$. An article dealing with experimental measurements and calculations will appear shortly in "Radio."

A. S. H. (Thursday Is.): No definite information is available at present regarding wave-length of broadcasting stations at the various centres. We suggest you communicate with Coastal Radio Service, Melbourne, regarding your other queries.

R. P. G. (South Brisbane) asks: (1) Approximate weights of wire needed for primary and secondary windings of transformer for the magnetic rectifier described in "Radio" No. 6. (2) Number of turns and gauge of wire required to wind honeycomb coils of the following inductances using a former 2in. in diameter, 1in. wide and 23 pairs of spokes.

Answer: (1) About two pounds for the primary and one for the secondary. (2) The following inductance

table for a standard make of honeycomb coil will act as a guide for you:

Turns.	Inductance Millihenries.	Wave-length range with 0.001 m.f. condenser.	
25	0.038	133—	370
35	0.078	192—	532
50	0.152	278—	748
75	0.316	386—	1062
100	0.561	527—	1438
150	1.29	771—	2160
200	2.22	1004—	2838
250	3.45	1272—	3570
300	6.79	1739—	5015
400	9.00	1990—	5720
500	14.45	2515—	7220
600	24.18	3300—	9380
750	32.31	3805—	10880
1000	60.50	5200—	14600
1250	96.18	6590—	18730
1500	143.00	8040—	22860

I. E. (Essendon) asks for data in making a transformer and rectifier for use with 230 volts A.C. to give 10 volts for filament and 500 volts for plate.

Answer: You will experience trouble owing to flickering of the filaments if a common transformer is used, therefore we are giving the data for two separate units for filament and plate supply respectively. Core $1\frac{1}{2}$ in. x $1\frac{1}{2}$ in. cross section built up from 16 mil. laminations to an outside dimension of 6in. x 5in. with a centre space of 3in. x 2in. Primary 800 turns of No. 24 D.C.C. Secondary for high voltage 2250 turns of No. 30 D.S.C., which will give 650 volts—150 volts extra allowed for drop in rectifiers. Two secondary sections will be required and connected in series to provide a centre tap. For the filament transformer. Primary same size, but with two separate and highly insulated secondaries for rectifier and oscillator filaments. Each will require 36 turns of No. 16 D.C.C. with a centre tap. All coils must be former

wound and made of such a width that the windings can be accommodated on one leg of the core.

C. W. (Orange) asks: Cause of difficulty in receiving telephony from Sydney (particulars of aerial and receiver submitted).

Answer: You should use one of the regenerative circuits published in "Radio" from time to time. The valve in the connection you are at present employing is not as sensitive as a good crystal detector.

A. W. L. H. (Randwick) asks: How to construct a variometer to tune between 150 and 400 metres, also approximate range of a single valve receiver (submits particulars of aerial and receiver).

Answer: The simplest form of variometer consists of two honeycomb coils in a two coil mounting connected in series. By varying the angular position the mutual inductance, and consequently the wave-length, will be altered. Questions regarding the probable range of a receiver cannot be answered owing to the many local factors involved. Your reception feats are excellent work for a crystal outfit.

Thanks for complimentary remarks re "Radio."—Ed.

Radio Experimenter (Longreach) asks: (1) Salary paid first-class and second-class ship's operators? (2) Approximate range of receiver (diagram and particulars given).

Answer: (1) Senior first-grade operators £25 per month. Third grade £14 per month, rising to £22 for first-grade operators. (2) Owing to the variable local conditions no definite information regarding range can be given.