THE RADIO RECORD

Published Weekly

REGISTERED G.P.O., WELLINGTON, N.Z., AS A NEWSPAPER — Price 3d.

VOL. I, NO. 34. — WELLINGTON, N.Z., FRIDAY, MARCH 9, 1928.

First Successful Television Broadcast

Two Hours of Magic Herald an Epoch Making Advance

A DIMINUTIVE moving picture of a smiling, gesticulating gentleman wavered slowly within a small cabinet in a darkened room of the General Electric Company's radio laboratories this afternoon and heralded another human conquest of space (states a special telegram from Schenectady, N.Y. State, to the New York Times, dated January 13.

Sent through the air like the voice which accompanied the picture, it marked, the demonstrators declared, the first demonstration of television broadcasting, and gave the first absolute proof of the possibility of connecting homes throughout the world by sight as they have already been connected by voice.

While a score or more of company officials, engineers and newspapermen in the darkened room heard and saw the radio announcer in another section of the laboratory, other groups in three Schenectady homes gathered about their receiving sets, the old loud speakers and the new television receivers, and joined in the reception of the dual broadcasting programme.

THE moving picture of the announcer, seen within the aperture three by three inches in each television cabinet, would float back and forth slowly as if on a screen, but it came clearly and distinctly, every motion being visible in all its details.

In their seats before the cabinets the groups in the homes had the drama of the laboratories brought before them. Although the apparently simple instruments gave no hint of the years of experimenting and the tedious process of trial and error, they produced the combination of sound and appearance which meant success, a man smoking a cigarette and commenting on its taste and an ukelele player humming a song.

The device failed to reproduce colours; one performer held a brightly-coloured cravat in front of the transmitter's eye, but to the receiver it appeared only plain cloth, without distinguishing colours.

TELEVISION has been demonstrated before. Last spring the American Telephone and Telegraph Company showed what might be done, but to-day's performance, according to the inventors of the machinery, was the first broadcasting and reception by means of instruments which within five years, some engineers predict, may be in most of the houses that now possess loudspeakers.

Home television was developed by Dr. F. W. Alexanderson, consulting engineer of the Radio Corporation of America and the General Electric Company, and his assistants. For seven or eight years he had worked on the principle of television, but the home sets are the development of comparatively recent months.

SEE AND HEAR BROADCASTER.

TO those who were awaiting the demonstration to-day he introduced his work with an explanation of his experiments and conclusions, adding the prediction that they would be "the starting point of practical and popular television."

David Sarnoff, general manager of the Radio Corporation of America, told the visitors that they were to witness the demonstration of "an epoch-making development." It was an event, he suggested, like the demonstration of wireless telegraphy by Marconi when he sent the first message through the air for a mile or two.

The visitors were ushered into a darkened room and crowded about two receiving cabinets, each a little more than four feet high and much resembling phonograph cabinets. The voice of Leslie Wilkins, of the General Electric testing department, came from the loudspeaker next to one of the cabinets.

"I understand there is an audience in the receiving room now," he said from the alcove where he was broadcasting, "so now we will start."

In the small openings of each of the cabinets appeared the image of his face.

WATCH AND LISTEN TO MUSICIAN.

"NOW I will take off my spectacles and put them on again," he said. The picture suited his words.

"Here is a cigarette. You can see the smoke," he continued.

The audience saw him breathe out a smoke ring and watched it drift upwards across his face.

Louis Dean, the regular announcer of WGY, succeeded Leslie. He was the first to broadcast music with his own picture as he played.

"Ain't She Sweet?" he trummed on his ukulele, and his smile flashed through the air to the onlookers.

The picture of each performer was not steadily maintained but shifted in the cabinet opening to left and right. If the image went too far to one side, another similar image appeared alongside the first, like two pictures on a strip of moving picture film, although in this case the images were identical.

Comparative steadiness, it was explained, could usually be maintained, however. The steadiness depends on the "steering" of a control knob on the face of the cabinet which regulates the speed of the revolving disc used in the receiving set and synchronises its rate with that of another disc used in the broadcasting set.

ENGINEERS EXPLAIN PROCESS.

ENGINEERS interpreted what had been demonstrated while the programme continued for two hours or more. The uninstructed observers saw in the receiving set only the cabinet with its regulating knobs and the opening with its magnifying lens at the front and a whirling perforated disc at the rear. Just behind the disc was a lamp of pinkish colour.

At the broadcasting end was only an arc light directed through another and larger revolving perforated disc on the face of the subject. A printed explanation, distributed by the engineers, thus explained these features:—

"The elements of the television home receiver are a light source, the scanning device and the synchronising system. The signal, or electro-magnetic wave from the television transmitter, is received in equipment designed to receive modulations as high as 40,000 cycles. The amplifier is substantially the same as the amplifier of the home loudspeaker. The receiving system differs from a modern loudspeaker system in that a neon gas-filled lamp is substituted for the loudspeaker. The amplified current is delivered to this lamp, known as the Moore lamp, which responds to the intensities of the current and gives fluctuations of the light intensity just as a diaphragm of the loudspeaker reproduces pulsations of the air waves.

LENSES ENLARGE PICTURE.

"THE scanning disc is 24 inches in diameter, with 48 small holes, each hole 35 mills in diameter and arranged in a spiral so that each of the 48 holes will pass each other and trace successive lines of the picture, completing or literally painting a picture in one revolution. In other words, if the disc were revolved very slowly a ray of light through successive holes would trace over the entire object.

"The disc is revolved by a standard motor, similar to those used in household devices such as the washing machine or vacuum cleaner. The revolutions occur at a speed of eighteen per second, slightly faster than a film passes through a motion picture camera. An observer, looking at this revolving disc as the light from the Moore lamp shines through these small holes, would see the image being sent by radio, but this picture would be but one and one-half inches square.

"Magnifying lenses enlarge the picture twice, so that it is three inches square in the aperture in the front of the receiver cabinet.

"Synchronisation of the scanning disc of the receiver with the scanning disc of the transmitter is obtained by manually operated control, a push button held in the hand. By means of this button, of the bell-ringing type, the picture may be held in the field of vision with a little practice as naturally after a time as driving an automobile or steering a bicycle.

THE TRANSMISSION SYSTEM.

"THE reproduced picture or object has a pink colour, which is characteristic of the neon gas used in the lamp. D. McFarlan Moore, inventor of the lamp and an engineer of the Edison lamp works of the General Electric Company, found in early work that this gas was most efficient and most sensitive for reproducing a light which will go on and off in a millionth part of a second.

"The transmission system is of the type using a disc with spiral holes, a duplicate of the disc in the receiving machine. A spot of light is projected on the object through the moving disc, and the reflection of this light is intercepted by photo-electric cells which convert the light to electric waves, ready for the short-wave transmitter. The transmission was made on 37.8 metres wavelength."

TO EXPLORE SECRETS OF SPACE.

WITH these devices not only the obvious commercial possibilities will be exploited, but the secrets of space itself will be explored, according to Dr. Alexanderson. By the systematic study of television across the continent what may be learned about wave propagation can only vaguely be imagined, he declared.

A part of the equipment is a new type of projector antenna which is now being tested with music and voice modulation, and favourable results have already been observed in San Francisco and Europe. It is built in a checkerboard pattern, the sides of each square being a wire half a wavelength long. All these halfway antennas are connected in such a way that they oscillate in phase and require no tuning or adjustment.

DR. ALEXANDERSON disclosed that a duplicate transmitter is being erected in the San Francisco broadcast station of the General Electric Company to provide means for systematically studying the physical phenomena of wave propagation over long distance, the eye being infinitely superior to the ears for analysing and ascertaining facts.

"This has already been proved," he said, "by our television tests in Schenectady. Occasionally, when we look in on television at our homes uptown, we observe a visual echo of the wave from the electronic layer on the upper atmosphere. The evidence of the echo is that two images appear side by side instead of one.

"The echo image is usually displaced a distance corresponding to one fifteenth-hundredth of a second, showing thereby that the echo wave had travelled about 200 kilometres, and yet the echo image is occasionally as strong as the direct image, which travelled only a few kilometres. Such phenomena cannot obviously be observed by the ear."

PREDICTS FUTURE OF TELEVISION.

MR. SARNOFF in his speech warned that television sets were not at once ready for the market, and he made no promise as to the time when developments still being made would permit the start of manufacturing in quantity. He did predict that in five years television would be "an art and an industry in this country."

"With all that has been accomplished there are still many experimental stages to be travelled before a commercial television service can be established," he said. "The first step contemplated is the placing of laboratory models of the present television receiver at central and strategically located points, so that with the aid of technically trained observers future experiments may be continued not only in the reception but in the simultaneous transmission, both sight and sound.

"The television receiver, as at present developed, will supplement and not replace the modern radio receiving set in the home. Broadcasting of television, it seems clear, will develop along parallel lines with broadcasting of sound, so that eventually not only sound but also sight through radio broadcasting will be available to every home."

The receiving sets in private homes were at the residences of E. W. Allen, vice-president of the General Electric Company in charge of the engineering; Edwin W. Rice, jun., honorary president of the board of the company; and Dr. Alexanderson.

New Points For Listeners and Dealers-- *By "Meter"*

The aim of this section is to give listeners information of new and interesting devices and sets on the local market. It is free of advertising intent or influence and to the best of our ability will convey only absolutely reliable statements. Names, prices and sources of supply are mentioned for the benefit of readers and to save individual Inquiry.

A CONVENIENT method of keeping one's wet A battery always up to concert pitch is to employ a home trickle charger, the latest development towards maintaining battery efficiency. A battery which is always kept well charged gains a much longer life than one that is permitted to become nearly exhausted from time to time. Furthermore, a well-charged battery affords greater efficiency in reception than one which is, say, only half charged. The trickle charger assures the maintenance of a fully charged battery from day to day without any worry over the likelihood of over-charging, as owing to its slow rate of charging there is not the least possibility of the accumulator becoming damaged. All one has to do, at the conclusion of an evening's listening-in, is to connect the battery charger to the house-lighting circuit and to the battery, and it will perform its function in such a way that the battery will be charged to its full capacity by the following afternoon or evening. I was shown, a few days ago, a strikingly neat little trickle charger, the Rectox (manufactured by the Westinghouse Electrical and Manufacturing Co.), for which Amalgamated Wireless (Australasia), Ltd., have the sole agency. I have subjected the Rectox to a series of tests, and have found that although it was in continuous operation for a lengthy period it did not get heated, and it delivered 1.2 amperes to a four-volt battery and .75 amperes to a six-volt battery at the normal charging rate. The Rectox employs no bulbs and has no wearing parts, which means a considerable economy, saving, as it does, any replacements whatever, being everlasting. The rectification is attained by means of a new device—a metallic, cuprous-oxide disc. The manufacturers have constructed the Rectox specially for the New Zealand standard 230-volt, 50-cycle household electric supply. It is absolutely silent in operation. The Rectox is particularly small and compact, weighing only 7lb., and its dimensions are: Height, 6 inches; length, 6 inches; width, 3½ inches. It is being retailed at £4 4s.

TRY THE BY-PASS CONDENSER.

RADIO traders can often pass a good hint along to home-constructors when they are purchasing their kits, and parts. A by-pass condenser in the plate circuit of the detector valve will materially improve the operation of the receiver, and will improve the quality of reproduction. The reason for this is that the radio frequency component found in the plate circuit of the detector tube after the detection process is completed must be given an easy path to the ground or low potential side of the filament circuit. The lack of a by-pass condenser is frequently the cause for lack of regeneration in tickler controlled or capacity feedback regenerative detector circuits. This by-pass condenser is also of importance in regular non-regenerative detector circuits. It means better detector valve operation and is a means of precluding the entry of the radio frequency signal voltage into the audio amplifier. Radio frequency chokes have been designed for this purpose, but the choke cannot be used without the by-pass condenser.

Experiments with various radio circuits showed that the type of circuit governs the size of the detector plate circuit by-pass condenser. It was also found that the frequency of the carrier governed the choice of the condenser. The higher the frequency of the carrier wave, the smaller the by-pass condenser. It is always advantageous to use the smallest possible condenser in order to minimise the effect upon the modulating audio frequency. For short wave receivers a .0005 mfd. is satisfactory.

Receivers employing resistance coupled audio amplification should be equipped with .001 mfd. of a .002 mfd. A .001 mfd. unit will suffice for transformers and choke coupled audio systems.

AN IMPOSING RECEIVER.

UNDOUBTEDLY one of the handsomest as well as efficient machines for the reception of radio broadcast programmes is represented by the Fada Console Eight, an eight-valve totally-shielded neutrodyne, seen in the showrooms of the National Electrical and Engineering Co., Ltd. At first glance it looks like an extremely handsome period escritoire, standing five feet high and two feet six broad, and presenting a delightful appearance with its surface sheen due to the polished walnut of which it is constructed. On opening a flap at the front the controls of the radio set are revealed, and these are two in number, to decide which station shall be received. Other controls are one to obtain the desired volume, and another the number of valves to be used (the power valve always remaining in circuit). A voltmeter and simple switch enable a check to be put over all the sections of the receiver in three seconds. An important consideration which the makers have taken full account of is the visibility of the markings on the tuning controls. It is immaterial whether the operator is sitting or standing, the wavelengths marked in metre lengths can be seen with ease, and adjustment can be made with minimum effort.

The astonishing sensitivity, selectivity, and quality of tonal effects, in combination with the celebrated Fada cone, forces a realisation that harmonated reception, as the makers term it, might easily be considered perfection, and when it is realised that by inserting a socket power equipment in the space provided in the cabinet, power may be taken from the the mains and batteries forgotten, the feeling that the last word in radio has been reached is more definite than ever.

A loop aerial may be swung into operation by simply pulling the loop out on a swivel from its place of concealment at the back of the cabinet. With the loop the sensitiveness of the equipment in an average receiving position is actually equal to a good five-valve neutrodyne with an average aerial. Here, therefore, is a receiver capable of doing all that is required for Australian or New Zealand reception without any connecting wires, except a flex to the power socket. Where no power is available, of course, batteries of orthodox design may be installed.

An aerial may be used with this receiver if desired by simply pulling out the two plugs connecting the loop, and this action automatically brings the aerial into action. The left-hand tuning control takes care of either aerial or loop.

Reports regarding results with these equipments show that with a receiving position reasonably clear of disturbances almost unlimited distances may be covered and various American stations are "on tap" whenever the time is right for trans-Pacific reception. Reception of Australian stations in daylight is being accomplished regularly by several of these machines.

Table models of this receiver are also available complete with loop, and even in this design are more than an average man can handle in weight and represent a radical departure from the old-established idea of a receiver being a panel, a baseboard, a light cabinet, and a few dials and batteries.

Incidentally, it is of interest to note that it is one of these models which is being installed in the Wellington General Hospital to drive all the speakers and hundreds of telephones which the completed installation will represent, thus showing its capacity as well as flexibility, because the same machine, with a simple adjustment taking three seconds, will deliver all that could be desired in quality and quantity to fill a small room.

CRYSTAL SETS TO BLAME

GREATER satisfaction would be obtained if New Zealand radio dealers would discourage home-constructors from thinking that any old collection of junk will serve to build an efficient crystal set, regardless of the character of the circuit. In Wellington, for instance, many owners of crystal sets, of the home-built type, complain of interference from the Government morse station, VLW, Wellington, and from amateur transmitters. An advisable plan for radio traders would be to have a diagram of a selective and efficient crystal circuit exhibited prominently in their shops and shop windows. Then when the component parts are purchased, and the customer builds his set according to the diagram, the results will win praise for the dealer and prove quite a good advertisement for him.

That crystal sets are among reasons for some of the complaints in the United States regarding broadcasting and poor radio reception has been emphasised recently to the U.S.A. Federal Radio Commission. According to advices to the Radio Manufacturers' Association from the Commission, a large volume of the complaints regarding radio reception would end if thousands of listeners-in would "junk" their old crystal sets, replacing them with up-to-date apparatus.

A striking instance of the information regarding crystal and regenerative sets which has reached the Commission, the R.M.A. is informed, is that in one north-western city of about 250,000 population, it has been found that there are 12,000 crystal sets in use.

Some members of the Federal Radio Commission think that fans' troubles about poor radio reception would be materially reduced if those still addicted to crystal sets would invest in real receiving apparatus, and keep pace with the great multitude of listeners-in.

The Radio Manufacturers' Association is taking steps to ascertain, if possible the extent to which crystal sets now figure in American radio reception. It will be difficult to get accurate information, but the R.M.A. will gather all that may be available.

The trouble in America is that the vast majority of crystal sets are pitched together with any old circuit, and are utterly devoid of selectivity.

SUPERB SET OPERATING WITHOUT BATTERIES.

TO merely plug in to the household electric supply and operate your receiving set without anything in the form of batteries has been regarded for some years as the ideal achievement in radio engineering. Diverse difficulties had to be overcome by radio engineers, but the master minds of the industry have, after diligent application, at last accomplished this feat, and to-day we have a new development which is capturing America by storm. The batteryless receiving set is now marketed without any of the minor drawbacks which marked its earlier stages. It was my privilege last week at the invitation of Amalgamated Wireless (Australasia), Limited, to witness a demonstration of a handsome console model of the Radio Corporation of America Radiola No. 32, which operates direct from the household electrical circuit without anything in the shape of batteries. This de luxe receiving set is equipped with the ordinary UX199 valves, and one power-valve, comprising three stages of radio-frequency amplification, two detectors, an oscillator and two stages of audio-frequency amplification, the circuit being the super-heterodyne in its latest form so that it can be operated with an outdoor aerial (having been approved of by the Post and Telegraph Department for that purpose) or in conjunction with a loop aerial enclosed in the cabinet. The loop aerial is rotated by a drum control. Those who do not desire to be bothered with the erection of an outdoor aerial will be interested to know that this set brings in the Australian stations with ample loudspeaker volume with the loop aerial only. Also embodied in the set is the Radio Corporation's world-renowned 104 electric-power loudspeaker. Those who have not heard this loudspeaker have a surprise in store for them. It marks a tremendous advancement in loudspeaker reproduction, particularly in tone, not to mention the extraordinary volume it is capable of delivering without a vestige of distortion. The set tunes from 200 metres up to 545 metres, covering the complete normal broadcasting band of wave-lengths. There are only two tuning controls, but these are adjustable so coupling them that one control will quite efficiently operate the set, although for finer tuning the two controls can be manipulated independently. The whole outfit is so simple that a child can operate the set; a switch turns on the current and a drum tuning control is revolved until the desired station is heard. The console cabinet is of mahogany in antique design, standing 4 feet 6 inches in height, 5 feet 3 inches in length, and 18 inches deep. It is an elegant piece of furniture which would look well in even the most sumptuous drawing room. The cost of electricity for operating the set works out at about one penny per night. This set is the first and only one of its type that has so far arrived in New Zealand. It is listed at £290.

DE FOREST SPEAKS.

IN an address broadcast recently by Station WRNY, New York, Lee De Forest, the famous inventor, declared that the most important steps in radio progress last year were the elimination of A and B batteries from many sets and the development of short wave broadcasting.

"Great progress was also made in the simplification of tuning devices," Mr. De Forest said. "There has been a marked improvement in the quality of musical programmes broadcast during the past two years. This is particularly noticeable on Sundays.

"During 1928 I am sure that great strides will be made in the qualtiy of reproduction. The better type of console radio with built-in loudspeakers will be more in demand. Most of the present sets are deficient in the quality of their audio amplifiers and in the loudspeakers employed. Although more expensive and more clumsy, there are certain types of non-metallic horns which give better reproduction than cone loudspeakers.

"Television, I believe, must continue to be extremely intricate, and must be built and operated at great cost until new discoveries are made in the field of physics."

TRAINING SERVICE MEN.

AS one advanced step toward improving the radio servicing situation which so vitally affects the public, in its purchase and satisfactory use of radio sets, as well as the radio manufacturer, jobber, and dealer, a movement to provide adequately trained men for radio ervice work has been initiated by the Radio Manufacturers' Association of the United States.

To give the radio-buying public skilled service in the installation and operation of its sets, to provide the jobber and dealer with trained service men, and the manufacturer with skilled employees is one of the larger problems of the industry, which the Radio Manufacturers' Association is trying to meet. Success, in whatever measure, will enhance public confidence, good will, and satisfaction, as well as aid the retail dealer in merchandising.

As a beginning in the plan to stimulate the training of service men, the R.M.A. is co-operating with the Essex County, New Jersey, Board of Education in the proposed establishment of a public vocational training school for radio service men at Newark, New Jersey. At the request of James F. Johnson, assistant supervisor of the Essex County Vocational School, 969 Broad Street, Newark, New Jersey, the R.M.A. is getting information to aid the Essex County authorities in founding its vocational training course for radio servicing.

Believing that an expression from the directors of the R.M.A. would be considered as an answer from the radio manufacturing industry to problems connected with the establishment of the Essex County Vocational course, questionnaires have been sent to all R.M.A. directors for advice, information, and text books, etc. Replies are being received with much valuable data regarding the development of technicians for radio service. This information is being forwarded to the Essex County Board.

In New Zealand a special radio class at the technical colleges would be bound to attract many students.

"SHORTED" BATTERIES

HELPFUL SUGGESTIONS

THE useful life of a "B" battery is often prematurely ended by a short-circuit of that battery, without the owner of the set in which it is used realising when or how it happened. If, for example, new batteries which have supposedly been subjected to a purely normal drain for a short time, show an abnormally low voltage upon being tested, the chances are that they have been ruined by some faulty connection, either on the batteries themselves or in the set. Before a claim is made the battery is defective, the connections inside the set should be examined. There may be a faulty or loose connection, a valve may be defective, a by-pass condenser may have broken down, or some metal object may have fallen across the battery terminals. The appearance of the battery itself will also help the set owner to determine whether or not a "short" has occurred.

Corrosion Caused.

The cells of a "shorted" battery will all, or in part, be corroded, the electrolyte will generally leak out, and the pressure of a finger nail against the zinc shell will often be sufficient to break through it, especially near the top. This point on the shell is where the upper part of the "bobbin" ends, and corrosion there is more pronounced than at any other place.

However, in the case of batteries which have become "shorted" after having delivered a great part of their energy through normal use, a subsequent short-circuit is generally not sufficient to cause any change in the casual appearance of the zinc.

There are other methods of determining in the laboratory whether or not a battery has been subjected to a "short" or an extraordinarily heavy drain, but these are too complicated to be mentioned here.

Internal "Shorts."

Internal "shorts" may be found in a "B" battery, but due to the rigid inspections made at the factories where really good batteries are made, these are rare. In the case of an internal "short," a single cell, or probably a few, will show a low voltage and the balance will show their normal voltage (1.5-1.6). Yet there are extreme cases where all cells will be low, due to a stray wire or the like having been accidentally dropped into the battery as it was being assembled.

Another point of importance is that it is possible to "short" one-half of a 45-volt battery and not the other half; that is, from the negative to the centre 22½-volt terminal, or from the centre to the 45-volt terminal. This is explained by the fact that batteries of this type really consist of two separate 22½-volt blocks connected together by a common wire, and also that taps are sometimes taken from the batteries to the set that involve a partial battery. For example, if two 45-volt batteries are used on a set, a tap may be taken from either 22½ volts or from 67½ volts. A "short" occuring in any of these places would include only a portion of a 45-volt battery.

Valuable Hints.

Here are some suggestions for the care of "B" batteries that should help to prolong their useful life.

Never test the strength of a battery by shorting it through a wire and observing the intensity of the spark produced. Batteries should be tested by means of a good voltmeter—one having a resistance of at least 50 ohms per volt and preferably 100 ohms per volt. Voltmeters not conforming to the above specifications cause the consumer to discard his batteries when they are still capable of giving many more hours of useful service. Never use an ammeter.

Examine the Set.

If large sparks are persistently produced when batteries are connected to a set, the valves of which are not lighted, the set should be examined for possible "shorts" or broken down by-pass condensers. Never leave batteries connected to a set behaving in this manner.

Should the batteries become hot immediately after being connected to a set, a short-circuit is indicated. Disconnect them immediately, as "B" batteries will be completely ruined when short-circuited for even a short period

RADIO WAVES EXPLAINED

A SIMPLE ANALOGY.

RADIO waves may be compared with water waves. Consider a pond of still water. The surface is smooth, quiet, without ripple or disturbance. That condition represents the ideal state of space through which radio waves travel.

Now drop a stone in that pond. Soon a series of small waves are travelling in ever-widening circles from the point where the stone disappeared.

Here we have a close parallel with radio waves, also caused by a disturbance and travelling in ever-widening circles from the transmitter.

It will be noted that as the water waves travel away from their source their force is spent. So with radio waves.

COUNT WAVE FREQUENCY.

Again studying the pond waves we note that they travel in even lines. If we count the number of lines or waves reaching a given point in one second we have the frequency of the wave motion.

If we note the distance from crest to crest of the waves we have the wave length. The power of the waves is indicated by the height of crest which obviously has nothing to do with frequency or wave length.

In radio the invisible waves travel throughout space at the amazing rate of 300,000,000 metres (186,200 miles) a second, which is also the speed of light. The wave length of radio waves is the distance between two consecutive crests or points of maximum disturbance, while the frequency is the number of waves reaching a given point in one second.

Wave length and frequency are so related that their product gives the velocity to wave motion.

USE OF KILOCYCLES.

Formerly the universal practice was to designate radio signals in terms of wave-length. To-day the practice tends to the frequency designation, expressed in kilocycles (thousands of cycles).

Radio waves range from wave lengths of 20 metres and less, termed short waves, to 12,000 metres and over for transoceanic communication, while the corresponding frequencies range from 3300 kilocycles for the short waves to 20 kilocycles for the long waves. The frequency is highest for the shorter waves, lowest for the long waves.

Howling--and its Cause and Cure

Full Analysis and a Reliable Test Outlined

By "M.I.R.E"

HOWLING valves are the curse of radio broadcast reception to-day, not only in the populated centres, but even in the country, where a single persistent offender can spoil an evening's entertainment within a radius of 10 or 15 miles, and even more.

MANY people are innocent offenders through sheer ignorance of the correct way to handle their receivers. It is surprising to find that numbers of good folk have entirely wrong ideas of just what causes howling, and although they are only too familiar with the effects of other howling sets on their own, they could not tell the symptoms of the same trouble being caused by their own apparatus.

THERE was a classic case only a few days ago, when an irate individual marched into a radio dealer's shop in Wellington with a set under one arm and sundry accessories in the other, and slamming the lot down, announced that he was through with radio for ever, because of a persistent howler who spoiled his entire programmes. The dealer handled him diplomatically, and after full inquiries had been made and the set reinstalled temporarily, it was found that it was the man's own receiver.

He had turned the volume control full on and left it there, apparently determined that he was going to get his full thirty bob's worth out of the aether. He got it, too! Also his neighbours!

A THORNY PROBLEM.

THE howling valve problem is a thorny one. It has been all over the world whenever broadcast stations have been opened, and remains so to-day, and will be to-morrow, too. All that can be hoped for is to keep it a minimum, but that minimum is of such a measure as to represent a workable value. There are many folk who advocate legislation designed to inflict severe penalties on offenders, and others who would prohibit the sale of receivers capable of becoming a nuisance.

It may be said right away that legislation has failed miserably to do any good in other parts of the world.

For instance, in Britain in 1922, regulations were issued with the object of controlling the issue of receivers capable of causing interference, but they were soon dropped because they were found to be unworkable, and in fact were unfair, as receivers of a given design, made professionally and turned down officially, were being put together privately by "backyarders" all over the country.

THE LEGISLATIVE ASPECT.

THIS same condition of affairs is in existence to-day in New Zealand. The Post and Telegraph Department have done their utmost to regulate the sale of apparatus likely to cause trouble, but in spite of that there are types of receivers selling to-day in dozens, and even hundreds, which are regular pests. They fit the regulations, and that's the end of it, and the beginning of trouble when they are sold to the average citizen. No blame is attachable to the Department, because even with the most flexible of regulations there are too many factors to be considered in testing apparatus for the regulations to be anywhere near 100 per cent. efficient. As a matter of fact, the New Zealand regulations contain one clause referring to the necessity of an inductive coupling between aerial and secondary tuning circuit, designed, according to popular report, to minimise the transference of energy from the receiver to the aerial, and therefore reduce the strength of the interference. This regulation, from a technical point of view, is merely comical, and has caused endless amusement amongst overseas manufacturers, who have considered the possibility of manufacturing for New Zealand. Long may it remain in force! It has had the effect of blocking the dumping of cheap apparatus, and has compelled those folk who want to obtain sets of small value to buy parts and put them together themselves, thus limiting the number sold. Overseas manufacturers have invariably been compelled to build machines of a more or less special design to meet the regulations, and invariably this has led to the production of a superior type of outfit to their usual cheap standard machines. Happily, the trend of design or home-made sets has been in the direction of crystal detectors and valve amplification. This arrangement can cause no interference, and is an ideal one from every point of view, especially for reliability and quality of signal reproduction.

DIFFICULT TO LEGISLATE IMPROVEMENT.

TO return to the question of legislation designed to prevent howling, it is interesting to note just how difficult it is to take any steps of value. Under the Act the operation of sets in such a manner as to cause interference is an offence. Stripped of legal language, and taking the moral meaning, that is what is meant. To obtain a conviction is a different matter. It is quite possible, from a technical point of view, to track an offender down, but it means having the proper equipment and personnel, both of which cost money, for a start.

Having located a howler, presumably the next step is to invade the offender's house in order to examine the set—provided, of course, that the Magistrate will not convict on the evidence of the direction-finder or other equipment used for location purposes. This sounds easy, but a lawyer would pick it to pieces in no time, and a psychologist would have plenty to say regarding the public indignation factor over the invasion of a house with or without a search warrant, even though the offender was found to have a 40-valve set! Multi-valve set owners would have little sympathy to spare, of course, but then they are only a small portion of the total community.

THE GOVERNMENT'S POSITION.

THERE is much speculation as to what the Government is doing with its 5s. per license fee. Take 40,000 licenses at this figure representing £10,000 per annum, and allowing for only 15 inspectors throughout New Zealand at £333 per annum, half of this money is gone at once. By the time administrative overhead as well as the actual time of collecting and accounting for moneys right throughout New Zealand is taken into consideration, there is little left to play with. The Secretary of the Post Office has already stated that this is so, and it may not be possible that further criticism on this point may sting the Department into showing the allocation of these moneys,

when it will be realised that declaring active war against howlers is out of the question.

UNDOUBTEDLY the Department has full information regarding the activities of the British Broadcasting Corporation in their endeavours to tackle this problem, and will thereby know just how far active detection and dealing with offenders can go with safety, and how much must be left to the common sense and decency of the listening public once they realise the very simple fundamentals with respect to howling characteristics. Of course if a person deliberately makes his receiver howl there is no remedy except to wait for the inevitable occasion when he will be most interested in the clear reception of a particular programme and somebody else will innocently give him a good dose of his own medicine.

MOSTLY CAUSED BY IGNORANCE.

THE majority of howlers are causing trouble innocently or carelessly. The former are easy to educate. The latter are harder because many of them are cussed.

As mentioned above, the remedy for the latter is a strong dose of howling from somebody else providing they don't retaliate by howling back deliberately.

This is an insane course, because there will be one or two others immediately retaliate the same way, and the last condition will be worse than the first.

THE WORST OFFENDERS.

THE worst howlers are to be found amongst people using one, two, and three-valve receivers, especially those using the "three coil" circuit. This latter type of outfit is an absolute pest, because unless very strong signals are being tuned in, the receiver will always be made to oscillate. Even a skilled operator will do so, although trying not to. It is no use saying that this design should be abolished, because it is a circuit of good efficiency for a small set. Users of it should be warned by dealers, and periodicals or books publishing diagrams of how to make up such receivers should instruct the makers how to minimise inevitable interference effects.

TOO OPTIMISTIC.

TRYING to "reach out" is the reason underlying the generation of most howling. There are many ambitious or optimistic people in New Zealand to-day who advertise or buy single or two-valve sets guaranteed to get Australian stations. Some of them "get" Australia all right, but their neighbours don't receive much while they are doing their "getting." What is not appreciated by operators of howling sets is that, while their set is oscillating, it is certainly at maximum sensitiveness, but at minimum quality, and if they are content to listen to such rubbish then they are either insane or going insane, and should consult a doctor immediately.

An oscillating receiver cannot under any circumstances give other than badly garbled results. Anyone who denies this statement has never heard even moderately decent signals.

THE TEST FOR HOWLING.

THE test for howling is simple, and is this. *Slowly* alter one of the *tuning* dials of the receiver when the receiver is tuned to the station it is intended to listen to.

If a whistling or singing note is heard, which varies in pitch as the dial is gradually turned, then the set is oscillating.

If the signals (consisting of music or speech, etc.) show a maximum at one spot as the dial is slowly turned, and on either side of the maximum decrease to a vanishing point without sign of that varying note, then all is O.K. If close to a transmitter, a set will not show this whistle, because the influence of the transmitter keeps the receiver in step with it, and prevents the note occurring. Under these circumstances the set will not tend to interfere with others, but will prevent reception of clean signals by the offending receiver itself.

TO stop oscillating or howling, move the volume or reaction control until the whistle vanishes, when the tuning dial is turned *slowly*. The loudest signals delivered in a clean tone will arrive just before the volume or reaction control is moved so far as to set up howling.

If there is no method of controlling howling, owing to the machine being fitted only with tuning dials, see the dealer who supplied the set at an early date and get his advice.

AUSTRALIAN PROGRAMMES

2BL SYDNEY (353 METRES)

The following are the official programmes for 2BL, Sydney, for Wednesday, March 7 to Sunday, March 11 inclusive:—

WEDNESDAY, MARCH 7.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus. 8.3: A concert arranged by Madame Marion Kemp, broadcast from the Parramatta Town Hall. 10.15: Resume of following day's programme; weather report and forecast, by courtesy of Mr. C. Mares, Government meteorologist. 10.20: Romano's restaurant dance orchestra under the direction of Mr. Merv. Lyons. Broadcast from Romana's. During intervals between dances "Sun" news will be broadcast. 11.30: G.P.O. clock and chimes. National Anthem.

THURSDAY, MARCH 8.

8 p.m.: G.P.O. clock and chimes; Broadcaster's topical chorus. 8.3: Miss Helena Stewart (soprano). 8.10: The Wurlitzer organ, broadcast from the Arcadia Theatre, Chatswood. Organist: Mr. N. Robins. 8.15: Mr. Harry Thomas (elocutionist). 8.22: Mr. Norman Wright (tenor). 8.29: Broadcasters' light orchestra under the direction of Mr. J. Knight Barnett. 8.39: Miss Eleanor Stanton (contralto). 8.46: Mr. Lloyd Davies (violinist). 8.53: Mr. H. Neville Smith (baritone). 9.0: G.P.O. clock and chimes. 9.1: Broadcasters' light orchestra. 9.11: Miss Helena Stewart. 9.18: Mr. Harry Thomas. 9.25: Mr. Norman Wright. 9.32: Broadcasters light orchestra. 9.42: Miss Eleanor Stanton. 9.49: Mr. Lloyd Davies. 9.56: Mr. H. Neville Smith. 10.3: Broadcasters' light orchestra. 10.10: Resume of following day's programme. Weather report and forecast by courtesy of Mr. C. Mares, Government meteorologist. 10.15: The Wurlitzer Organ, broadcast from the Arcadian theatre, Chatswood. 10.30: The Wentworth Cafe Orchestra under the direction of Mr. S. Simpson. Broadcast from the ballroom of the Wentworth. During intervals between dances "Sun" news will be broadcast. 11.30: G.P.O. clock and chimes. National Anthem.

FRIDAY, MARCH 9.

8 p.m.: G.P.O. clock and chimes; Broadcasters' topical chorus—dance night. 8.3: The Happiness Girls' Dance Band. 9.0: Romano's Restaurant Dance Orchestra, under the direction of Mr. Merv. Lyons. 9.10: From the studio: Mr. Robert Vawdrey (elocutionist). 9.15: Romano's Restaurant Dance Orchestra. 9.25: From the studio: Mr. Gordon Ireland (songs at the piano. 9.30: Romano's Restaurant Dance Orchestra. 9.40: From the studio: Mr. Robert Vawdrey. 9.45: Romano's Restaurant Dance Orchestra. 9.55: From the studio: Mr. Gordon Ireland. 10.0: G.P.O. clock and chimes. The sporting editor of the "Sun" will talk on the prospects of Saturday's racing. 10.15: Weather report and forecast, by courtesy of Mr. C. Mares, Government meteorologist. Resume of following day's programme. 10.20: Romano's Restaurant Dance Orchestra. During intervals between dances "Sun" news will be broadcast. 11.45: G.P.O. clock and chimes. National Anthem.

SATURDAY, MARCH 10.

8 p.m.: G.P.O. clock and chimes; Broadcasters' Topical Chorus. 8.3: Heye's Banjo Troupe. 8.10: Mr. Cecil Chaseling (baritone). 8.17: Miss Nell Crane (comedienne). 8.24: Mr. Jack Win (entertainer). 8.31: Miss Dorothy Tapp (soprano). 8.38: Broadcasters' Instrumental Trio. 8.45: Broadcast from the stadium: A description of the boxing contest. 9.30: From the studio: Heye's Banjo Troupe. 9.37: Mr. Cecil Chaseling. 9.44: Miss Nell Crane. 9.51: Mr. Jack Win. 9.58: Broadcasters' Instrumental Trio. 10.5: Miss Dorothy Tapp. 10.12: Resume of following day's programme. 10.15: The Wentworth Cafe Orchestra, under the direction of Mr. S. Simpson. Broadcast from the ballroom of the Wentworth. During intervals "Sun" news will be broadcast. 11.30: G.P.O. clock and chimes. National Anthem.

SUNDAY, MARCH 11.

5.45: Children's session. 7.0: service broadcast from Chalmers' Presbyterian Church, city. 8.30: Broadcaster's instrumental trio. 8.37: Miss Mary Neal (mezzo-soprano). 8.44: Mr. Stanley R. Catlett (tenor). 8.51: Mr. Bryce Carter ('cellist). 8.58: Miss Camille Alder (soprano). 9.5: Mr. Clement O. Williams (baritone). 9.12: Miss Norah Alexander will give the fourth of a series of talks on modern English poetry—James Elroy Flecker. 9.22: Mr. Stanley R. Catlett. 9.29: Broadcasters' Instrumental Trio. 9.36: Miss Mary Neal. 9.43: Mr. Bryce Carter. 9.50: Mr. Clement O. Williams. 9.57: Broadcasters' Instrumental Trio. 10.4: Miss Camille Alder. 10.11: Resume of following day's programme. Weather report and forecast, by courtesy of Mr. C. Mares, Government meteorologist. 10.15: G.P.O. clock and chimes. National Anthem.

The United States has progressed in radio until it is ahead of all the other nations of the world, stated Senatore Guglielmo Marconi on the occasion of his recent visit to that country.

HEADPHONE RATTLE

A SINGLE CURE.

One earpiece in a pair of head telephones can easily get out of adjustment without the owner realising that it is faulty. This happens through the metal diaphragm just under the ear cap, touching the magnet polepiece inside the cap, instead of being just clear of it. The sound from the receiver is produced by the vibration of the diaphragm, and if it touches the magnet it cannot vibrate freely, and the sound it produces is much reduced. If only one headphone is faulty the trouble is often not noticed, or if it is the decrease in signal strength is blamed on to the broadcasting station. The headphones can easily be tested. If the portion of the diaphragm visible through the hole in the centre of the earpiece is lightly tapped with the fingernail or a pencil end, a faulty earpiece will give out a dead, metallic sound. If the adjustment is correct a characteristic hollow noise is produced by tapping the diaphragm. Much care should be taken to see that the diaphragm is not struck hard enough to dent it. A faulty telephone can be readjusted often either by screwing the cap slightly tighter or loosening it a little. If this fails the cap should be removed and the diaphragm carefully lifted off the body of the earpiece. A light paper ring can then be cut to fit between the body of the receiver and the diaphragm. The presence of this ring between the receiver and the diaphragh will hold the diaphragm clear of the magnet poles. The diaphragm can also be reversed, and if it is slightly bent the diaphragm will not touch the magnet.

Scientists have discovered that a piece of metal cooled to extremely low temperatures becomes almost a perfect conductor. An English experimenter, Mr. Alan J. Bremner, has announced to his radio society that when the antenna coil of a set is immersed in liquid air, while the strength of the signal is not increased, the selectivity becomes remarkably high.

A flash lamp bulb connected in the negative lead of the "B" battery makes a very good fuse. Should the battery become short circuited, the lamp will burn out, thus breaking the circuit, and the battery will be saved.

THE NEW ZEALAND Radio Record

PUBLISHED WEEKLY.

Printed Tuesdays to permit of effective distribution before the week-end, with full copyrighted programmes for the succeeding week. Nominal date of publication Friday.

LITERARY MATTER.

All literary matter and contributions must be addressed to the Editor.

SUBSCRIPTION RATES.

Rate of Subscription: Single copies, 3d.; Annual Subscription (if booked), 12/6, post free; normal rate, cash in advance, 10/-, post free.

ADVERTISING RATES.

Schedule of Advertising Rates available from all advertising agents in New Zealand, or write: "Advertising Manager," Box 1032, Wellington.

Advertisements requiring setting should be in hand not later than Friday of each week to ensure publication in succeeding issue. Stereos and blocks, providing space has been arranged beforehand, can be accepted up to midnight Monday. Contract advertisements not changed will be repeated.

No responsibility is accepted for blocks, stereos, etc., remaining unclaimed after last use, beyond a period of three months.

A. J. HEIGHWAY,
Managing Editor,
"The N.Z. Radio Record,"

P.O. Box 1032.
Dominion Buildings, Mercer Street, Wellington.

WELLINGTON, MARCH 9, 1928.

THE END OF SUMMERTIME.

The end of summertime and the immediate shortening of the evening hours, so far as the approach of darkness is concerned, by one, will mark an advance in the conditions of reception and renew an intense interest in broadcasting, particularly on the part of rural listeners, who unquestionably have definitely suffered through the operation of summertime. The inquiry conducted through our columns recently as to the views of listeners quite plainly showed that. It is the rural listener to whom the trade and broadcasting in general must, we think, look for expansion now. The cities certainly have not reached saturation point, or anything like it, but the rural districts have not as yet responded to the lure of radio to the extent that its advantages make desirable. With the end of summertime and the approach of the longer winter evenings, the time becomes opportune for definite concentration on this field. In our view everything possible should be done to encourage the radio habit by country people, for to them it is very much more than a toy or an opportunity for an evening's entertainment. It is of definite commercial value, particularly in relation to the news service and market reports, as well as in weather reports. We have heard of cases in Canterbury where farmers, unfortunately not yet possessed of wireless sets of their own, have ridden or driven up to 20 miles in order to hear the weekly broadcast of the Addington market. The knowledge thus gained of the trend of stock prices has proved of outstanding financial importance to them, and resulted in their securing full value for their stock in subsequent paddock sales.

TELEVISION IN FIVE YEARS.

The special report we are able to give in this issue of the first successful broadcast of television will be read with intense interest by all who are impressed with the wonderful performances of the age in which we live. Television is the next big advance on which all eyes are centred. It is now a scientific actuality. Sight has been broadcast; the waves have been caught, and the scene depicted re-visualised in not one, but several homes. It remains now but for the scientific actuality to be made into a commercialised possibility, on such a scale as to be available to the people. The view of Senatore Marconi as expressed in a recent impressive interview is that it may not be possible for commercial and financial reasons to put a television set in every home in the way that is at present conceived, but that it may be possible for special theatres to be operated much on the lines of our present picture palaces for the reception of broadcasts of historic events. This would be wonderful enough. The short wave era is now with us, and is adding new wonders of performance to its laurels almost week by week. What the next five years will bring in detailed development it is impossible accurately to prophesy, but that it will be a very pregnant and wonderful period is unquestioned.

Am I Howling?

THE UP-COUNTRY NOVICE

STATES HIS DIFFICULTIES

THE CASE DIAGNOSED.

(By 'Switch.")

ALL radio enthusiasts sympathise with the up-country novice listener whose remoteness from the centres of settlement renders his plight most trying when he encounters trouble with his receiving set. To make matters worse, his frequent unfamiliarity with even the elementary technicalities of radio prevent his supplying a lucid explanation of his troubles, and necessary data regarding valves, battery, voltage, etc., when he applies to a city radio writer for assistance. This renders the feat of diagnosing the trouble in the up-country novice's set a most difficult matter for the radio writer, and adds to his labours enormously. This is not intended as a reproach to up-country correspondents, but it may stimulate them to endeavour to supply fuller particulars regarding their equipment, such as make and type of valves, battery potential, age and type of batteries, character of aerial and earth, make and type of loudspeaker, make and trade number of receiving set, etc. Up-country correspondents will realise the difficulty that would confront a medical practitioner if he were called upon to diagnose the ailments of patients by correspondents, even if they gave the fullest particulars as to the symptoms. It is certain that even the most skilled and experienced doctor would not commit himself to a diagnosis in the majority of such cases. The position is somewhat akin in radio, for a receiving set can develop "sickness" from various and widely different causes, just as a pain in a patient's body may be due to different diseases.

The Case Stated.

THE following letter from "R.J.M." (Urenui) has been handed to me for consideration. The writer of it may be classed a type of listener whose isolation places him at a great disadvantage, so that he merits whatever assistance can be rendered.

"We have a five-valve —— set, and are much annoyed by a horrible distortion in reception (at times), which I can only describe as 'nasal.' Frequently, too, squeals and whistles continue for some minutes. In answer to a disparaging remark re 'howlers,' I have been told that 'perhaps your set annoys the others.' Now there has never been the least suggestion of 'squeal' or 'whistle' when tuning in on this set. Is it possible for any set to develop 'howls' after a few minutes or a few hours' perfect reception? Our set was bought second-hand, and we do not know from whom it was procured in the first place. The only knowledge that we have was learnt from Cassel's 'Simple Valve Sets,' and from newspapers, but nowhere can I find a suggestion that a set can 'howl' without the knowledge of the 'tuner-in.'

"Our experience of 2YA is 'no fading, but rather low volume in the afternoons,' and 'plenty of volume but much fading' in the concert session. We invited quite a few friends to hear the Maori Pageant—25 all told 'listened in' on our set. The nearest sets are about four miles on either side of us.

"Since writing the foregoing I have found, in the 'Radio Record' of February 17, two items re oscillation, which is, I believe, 'howling.' Firstly, that a set builds up a 'howl' from the loudspeaker, and, secondly, a simple test for oscillation. Now, this seems to verify the gentleman's assertion that our set can annoy others. But, in such a case, would the 'howling' or distortion, as described, cease immediately on 'tuning in' to some other station? Now, last Monday we could not enjoy the concerts from either 2YA or 3YA, but from 2BL got a good lecture on Hawaiian music and later the concert came in quite equal to anything we hear in New Zealand. Also we frequently have to 'tune out' from 1YA which is generally our best reception. It is 1YA from which we get that 'nasal' distortion. We cannot get 4QG at all distinct, it seems to have a distortion similar to a noise that can be evolved on our set by wrong adjustment in the speaker.

"We are rather anxious to ascertain the truth about the 'howling' as we 'tune in' every day. Sometimes, as during the Tasman flight, and the Maori pageant on the Tuesday night, we have have had our set 'tuned in' from the afternoon session, opening at 3 p.m. to the finale, and have heard 2BL close done and 2FC rebroadcast from 2LO, so if we are annoying anyone, we are doing it thoroughly."

"I have kept this letter open to give you the result of the 'simple test' of which I read. This test was applied on 'tuning in' to 1YA last evening, and again when a 'howl' developed, and there was a total absence of any 'click' or sound of any kind. While I am writing I may say that we sometimes get a lot of intermittent buzzing. I think it is Morse. Some other sounds we located as loose connections. These particular noises were very bad last Monday night, and we tried every connection around the set, but failed to locate any noise from them. However, on 'tuning in' to 2BL, the noises ceased."

["R.J.M." has supplied the name of his set, but it is quite unknown to us. —Ed.]

Possible Causes Discussed.

FROM the above it will seem at first glance that "R.J.M." has contradicted himself in the first portion of his letter. He says, "Frequently, too, squeals and whistles continue for some minutes." Further on, he writes, "Now there has never been the lease suggestion of 'squeal' or 'whistle' when tuning in on this set." Statements of such a seemingly completely conflicting nature may, however, bear a different construction. Possibly "R.J.M." means to convey that while actually tuning in, there are no squeals or whistles, but after he has tuned in they commence.

His troubles appear to be:—

(1) A "Nasal" distortion at times from some of the New Zealand stations, but no such distortion from 2BL, Sydney.
(2) Squeals and whistles which continue for some minutes.
(3) Howls, which develop after a few minutes or a few hours' perfect reception.
(4) Intermittent buzzing.

Detailed Consideration.

Let us examine his complaint about "nasal" distortion. At the outset it is quite possible that this distortion is due to the action of some neighbouring listeners (even four miles away), tuning their sets so that they are slightly oscillating. "R.J.M." admits that at times he gets perfect reception from 2YA, Wellington. On such occasions it is possible that his neighbours are either avoiding oscillation, or that they are listening to another station, or, further, not listening-in at all. Then, again, there are certain areas in Taranaki (where he resides), which are subject to intermittent distortion, due to some natural, obscure cause, such as absorption by sub-terranean mineral belts or intervening high land absorption of radio waves from north or south, but not from the open sea space westward.

Other Points.

THE squeals and whistles (2) are possibly the "howling" valves of neighbours. They may also be due to excessive use of reaction in "R.J.M.'s" own set. He does not state whether his set is regenerative, as he evidently does not know. A corroded "B" battery connection will sometimes cause squeals, as also will too much or too little "B" battery potential on his detector valve, the type and make of which he does not mention.

The howl referred to (3) may be anything from the howling of a neighbour's valve to a howl developed on the audio side of his set—not on the aerial side or radio frequency side of his detector valve. It is quite evident that his set was not occasioning interference with other listeners, when he applied the test by tapping his aerial terminal with a moistened finger, and heard no click in his loudspeaker. The audio howl may be due to various causes, among which are inter-action between the audio-transformers through being badly placed in relation to each other, an acoustical effect on the detector valve through the loudspeaker being placed too near the set or pointed towards it, or, even through the use of an extra long twisted-flex loudspeaker cord.

Groping in the Dark.

DIAGNOSING this trouble at a distance is like groping in the dark. Run-down, or exhausted, "B" batteries caused a howl in a loudspeaker which the writer was called upon to examine recently. If a 45-volt dry "B" battery is down to, say, about 35 volts it should be thrown away. To prevent the howl due to the length of the loudspeaker cord a fixed condenser of, say, .002 mfd should be soldered across the loudspeaker cord close up to the receiving set. To prevent the loudspeaker causing the detector valve to howl through acoustical effect, the loudspeaker should be moved away and pointed away from the set, or a rubber sheath, such as a section of an old bicycle rubber tube, should be fitted over the valve itself.

THE intermittent buzzing (4) seems to be ship "spark" transmission, which is drowned out when 2BL is tuned in.

"R.J.M." need not be perturbed by the blurring of 4QG, Brisbane. For several months past reception, in New Zealand, of that station has been badly distorted.

One could go on, almost by the page, suggesting possible causes of "R.J.M.'s" difficulties, but I have mentioned the most probable. On the other hand, a personal testing of the set would most likely reveal the position in a couple of minutes.

Wireless as the Ally of Music

APPRECIATION OF WELLINGTON'S CHORAL UNION CONDUCTOR

Mr. J. Bishop, the newly-appointed conductor of the Wellington Choral Society, who has recently arrived from Britain, frankly admits the immense value of radio broadcasting as an ally of music, and attributes much of the present position of British musical composers to the educative influence and popularising effect of broadcasting. English composers to-day, he said in an interview, could compare with any of the modern composers of European countries. This was attributable in some degree to the coming of wireless, which undoubtedly had done a great deal for music in England. An outstanding success in that field was the broadcasting of the famous promenade concerts from Queen's Hall.

On Monday evening, March 5, listeners from 2YA were privileged to hear a talk from Mr. Bishop. Mr. Bishop is by birth an Australian, but has resided for some years past in Britain. He is an accomplished pianist, and while in England gave numerous recitals in the provinces and smaller halls of London. He hopes to do a lot in New Zealand in the way of pianoforte recitals, and also to introduce some new works.

LICENSE FEES

CRYSTAL V. VALVE

SHOULD THE FEE BE REDUCED?

With the near approach of March 31, when all listening-in licenses have to be renewed, the question has been asked by a correspondent why the license fee paid by crystal set users should not be reduced. The correspondent considers that the owners of valve sets, having more stations to which they can tune in to, should pay more than crystal set owners. On the fact of it, this seems a reasonable argument, but when one looks into the question, one is inclined to think that it is the valve set owners whose fee should be reduced. A writer "Dial" in the Christchurch "Sun" thus sums up the position:—"Crystal Set" writes in last evening's "Sun" asking when the Government is going to reduce the license fee. What's biting him? Doesn't he know that it is because of the crystal set users that the fee is as high as it is? If there were no crystal sets there would be no need for four stations in New Zealand, for 2YA would serve all valve sets users from North Cape to Bluff. If there were only one station there would be only a quarter of the expense to the Broadcasting Company. And if there was only a quarter of the expense the license fee could be a quarter of what it is. That is the grievance we valve set owners have against the crystal set owners. It is adding insult to injury for "Crystal Set" now to suggest that we valve set owners who have spent twenty times what crystal set users have spent should continue to pay the 30s. fee, while crystal set users, who are responsible for the present fee, should have theirs reduced. Personally, I think that 30s. a year is little enough for a valve set user who has four New Zealand stations to chose from, and certainly not enough for a crystal set user who has been directly responsible for his local station having been erected.

The Miracle of Short Wave

TWO OUTSTANDING EVENTS IN THE WEEK

Last week was notable for two outstanding events in the short-wave field. The first was of intense local interest in recording the arrival at his home town, Bundaberg, of the intrepid Australian flier Hinkler after the greatest flight in history. This was broadcast both on the ordinary wavelengths and on the short-wave medium, and some local enthusiasts secured satisfactory reception. The number of those interested in short-wave contact with the outside world is steadily increasing and events of this nature will tend to entice others into the field. In this connection the interesting notes contributed week by week by Mr. Sellens are undoubtedly playing their part in creating general interest.

The second event of moment was the contact made by the well-known Gisborne amateur, Mr. Ivan O'Meara, with America in order to secure the outcome of the Heeney-Delaney fight. This would seem not to have been broadcast as other more notable recent fights have been and it was necessary for Mr. O'Meara to make contact with another amateur for him to be put in touch with the "Boston Globe" from whose reporters he was able to secure a concise summary of the fight and its outcome. The incident, however, serves to illustrate just how tremendously the barriers of distance have been broken down, and give point to the views of Senatore Marconi, expressed elsewhere in this issue, regarding the tremendous possibilities of the next five years.

Mr. F. W. Sellens (Northland) writes:

On account of 2YA announcing the proposed broadcast of the arrival of Hinkler at Bundaberg, I was "on the air" ready for him and did well.

Reception from 5SW from 7.30 a.m. continues to improve. The station calling "Su Japanese" has again been heard on about 31 metres. The 40-metre station is still doubtful as to its identity.

Short wave listeners will have to arise one hour earlier now for the early morning transmissions. On Saturday afternoon, February 25, both KDKA and 2XAD came in fairly well late in the afternoon, but the modulation of the former station has gone off a lot lately.

During the evening, on 35 metres, the call JOAK was heard. It appeared to be the children's session, as children were singing very nicely, then am "Auntie" told them stories, and more singing. After 10 p.m. a lesson in English (so it seemed) was given. They started off with "On a summer's day," then repeated in Jap., a few more words in English, and so on. Then the whole was read in English. The longer and more difficult words were spelt. I did not hear the call of the short-wave station, but they were apparently relaying JOAK, as that call was heard several times

RFM was transmitting on 70 metres.

I got up for a few minutes early on Sunday morning to see how PCJJ were coming through, and was well repaid for the trouble. "Always" was coming through in great style at 5.30 a.m. This was followed by two banjo items which concluded the programme, with the announcement that they were closing down till Tuesday 28 from 15 till 19, G.M.T. It is a pity that reception is best from "over there" when all good people should be in bed.

KDKA closed down in the afternoon before 4 p.m.

2XAF were heard very well relaying music from a hotel interspersed with items from the WGY studio.

They closed down at midnight Easter standard time. 2XAF announced their wavelength as 31.4 metres; it has been 32.77 till now.

A station on about 33 metres was heard transmitting music and talk early in the evening. It was probably 2NM (Marcuse). Reception was very weak and spoilt by morse interference. 2HM Bondi, N.S.W., and RFM were heard later on in the evening.

3LO, Melbourne, on 32 metres, started at 7 a.m. Monday morning, and, as usual, were very good.

Hinkler's Arrival.

Late in the afternoon I was advised that "Farmer's" were going to broadcast the arrival of Hinkler at his home town of Bundaberg, so I tuned in 2ME on 28.5 metres, and found they were "on the air" with musical items from 2FC studio, filling in the time till the airman was expected. They switched over quite a number of times before any news was heard.

4QG, from where the broadcast originated, announced that they were connected up with Bundaberg by land line, and were being rebroadcast by all the southern stations. The announcements and music from 2FC studio were loud and clear, but the talk from Brisbane was not at all clear; the land lines and rebroadcast would account for this.

At 6.40 p.m. (our time) the spectators started, "Look, there he is—right up there over the clouds," with loud shouting and cheering. The announcer described how he (the airman) was getting closer and circling the town and landed at 6.48 p.m.

"The crowds are rushing over," "Just jumped out of the 'plane," "Carrying him shoulder high," were some of the particulars announced. During this the bands were playing "See the Conquering Hero." "Home At Last" was heard from the people.

At 6.57 the official party mounted the platform when Hinkler was welcomed by the Mayor of Bundaberg, Colonel Brinsmeade, Hon. W. McCormack, Premier of Queensland, who in conclusion presented Hinkler with a cheque for £500 on behalf of the Queensland Government. Mr. Barber, M.L.A., and the secretary of the Returned Soldiers' Association, also said a few words.

Hinkler, in replying, said: "—— "Your reception is overwhelming—too overcome for words—glad to be home again among you all."

In returning to the studio, 2FC announced that, as overseas listeners probably did not hear all that was said on account of land line noises, etc., he would repeat the various items of interest. He then repeated all the particulars in full that I have outlined, giving the time of each announcement. A musical item from the studio and reference to closing down ended a very interesting transmission.

Other Stations.

On Tuesday morning, the 40-metre mystery station was the only one heard, while 2AB, Wanganui, and 4NW, Queensland, were on the air in the evening.

PCJJ was in splendid form on Wednesday. I tuned them in at 5.25 a.m. and held them most of the time till 7.45 a.m. A good gramophone programme was enjoyed, volume was quite good 'speaker strength till about 7.30, when it began to decrease.

"Hello, Su Japanese" was heard calling and talking during the above period, almost as loud as PCJJ. Foreign talk was all that was heard, with the "Su Japanese" as frequent intervals.

Domestic Gossip From London.

On Wednesday morning 5SW was telling 2XAD all about his transmission, etc. Later on an American visitor came to the "Mike" and asked for "Ted or Fred," and asked him to tell Mrs. (giving her telephone number) that "I will be home a week come Thursday." "Tell her I have had all I want of English weather." "Tell her I am extremely lonesome, alone in a London hotel," etc.

At 7.30 Big Ben and "London Calling" was heard on the speaker quite well, followed by a talk about motor ambulances and motor accidents and deaths, giving figures, etc. I gathered that he was appealing for funds for the ambulance. At 7.45 "London Calling" and Miss —— will sing and play ——. I heard the first item by this lady, but had to close down at that time. This was all heard from the speaker—not loud, but audible three or four feet away. It should be possible soon to hear quite a lot of this morning test on the loudspeaker.

The 40-metre station and a stranger on about 36 metres were heard on Thursday morning, but neither were intelligible. 4NW, Queensland, was testing in the evening, and RFM put on some good musical items, which were very enjoyable.

On Friday morning PCJJ again were heard at good volume, steadiness and modulation. At 7.25 a.m., when I closed, they were still coming in very strong.

5AW, South Australia, was calling an American station. I heard someone giving musical items on about 80 metres, but static was too bad. It was probably a harmonic of an Australian station. 5SW was quite good on Saturday morning just after 6 a.m., with their talk to 2XAD, at 20ft. from the speaker; every word of the Englishman could be understood, the other voice could be heard, but only an odd word or two readable. They are, so it was said, each listening to the other through a loudspeaker. Big Ben came in loud and clear at 7.30 a.m.

German Stations Heard.

A. P. Morrison (Brooklyn): Since last writing you, I have been successful in logging three more foreign stations, the first being on February 17 at about 8.30 p.m. On first listening to him, he was calling different countries, Hullo, Hullo, Japanese, Hullo Germany, Hullo Austria. After that there were long speeches by three different men. The station continued on till a little after nine, when it closed. He was operating on 31 metres, and his strength and modulation was perfect. No call was given in English. The following morning a German station was logged at about 6.45 a.m., giving his call as R.S.R. Harlsone, Germany. No music was given; all speech. A little was understood, such as "Dear friend . . . Summer very hot . . . 35 years since that happened." This station continued on till 8 a.m., and was still going when I closed down at that time. On Thursday, February 23, I received another German station operating on about 32 metres, giving his identity as AFAK or AFA. He began at about 10.45, and then there was speech and music. I heard two items, they being "The Stars and Stripes," American National Anthem, and also the "French National Anthem"; also other well-known musical items. This station was again heard on Friday and Saturday, his transmission running well on till after midnight. Friday, February 25, was a good day for SW. 2ME, Sydney, 4NW, Bondi, N.S.W., AFAK, Germany, RFM, Russia, ANE, Java, PCJJ, Holland all being heard. To-day (Sunday), when 2XAF signed off at 5.30 p.m., our time, he gave his wave-length as 31.4 metres, not his usual 32.77 metres. I will conclude here, hoping to give you more foreigners as time goes on, because it seems to me each country in the world is waking up to the fact about SW transmission. P.S.—To-night (February 26) JHBB is on the air again with some more of the high call music and singing.

T. Weir (Waiketu Island): I notice in the "Radio Record" of February 24 you welcome reports re 2YA reception. I am located about 20 miles from Auckland in the Hauraki Gulf. I have a five-valve set with a 90ft. aerial, and I may state 2YA is my worst station. In fact, I never tune in when I can get 1YA or 3YA, as one cannot leave the set when listening to 2YA, as one has got to be continually altering the volume and amplification. The programmes from the New Zealand stations have been very good of late, but could do with a few more of the old-time songs; Scotch or Irish. Have you given up all idea of publishing the Sydney or Melbourne programmes? Is it not possible to have them broadcast from Australia in time for publication in that week's "Radio Record," which would be greatly appreciated by a great number of your readers. In fact, I think it would pay to publish an Australian by itself. Carry on the good work.—[We have been able to publish 2BL'S programme for part of the week recently. The trouble is they don't reach us in time.—Ed.]

The Hinkler Broadcast.

R. L. Jones (Wellington): Obviously aviation and wireless are, of necessity, closely related, both during manoeuvres and special flights. Therefore, listeners who have been fortunate enough to tune-in broadcast or short-wave stations and received accounts of airmen, have been well repaid for the little trouble in so doing.

Take a case in point—Monday night, February 27, between 10.15 and 11.45 (N.Z. time), 4QG (Brisbane) broadcast the civic welcome to Herman (Bert) Hinkler at Bundaberg, Queensland. Although a line was hurriedly installed by the P. and T. Department in Queensland, the broadcast was worth while.

Listeners who "fluked" on the special transmission from Bundaberg naturally had to put up with slight "mush" and "blurring" from 4QG, but by careful handling of a receiving set, it was possible to hear almost every word fairly clearly.

Another notable case was when Captain Cobham arrived in Australia. In most cases these special transmissions are unexpected; at least, not publicly notified beforehand; therefore, listeners have to be on the alert in case anything special is likely to "come over."

With short-wave the same applies; and listeners who desire good, interesting pastime, should provide themselves with a short-wave set.

Only those who heard the ceremony broadcast from Bundaberg have any idea what a splendid reception Hinkler received; and the noise was deafening, when he rose to acknowledge the many tributes passed to him by the prominent persons who spoke at the civic welcome.

I sincerely hope the day is not far distant when the Broadcasting Company here in New Zealand will be able to "serve up" to advantage, some of the broadcasts from overseas.—[We agree—when the technical difficulties permit!—Ed.]

U.S.A. APPRECIATION

OUR SYSTEM ADMIRED

Using as a text an article published in an American radio journal, a radio writer in an Auckland paper goes to considerable trouble to ridicule broadcasting in New Zealand. The American writer had had a chat with Mr. J. M. Bingham, the Broadcasting Company's radio expert who has been on a visit to America, and, as American journalists sometimes do, he had taken a few liberties in writing his article. He was, however, impressed, and rightly so, with the excellence of the way in which broadcasting is conducted in New Zealand, and he went so far as to say: "As a matter of fact, the entire broadcasting industry of the United States might profitably visit New Zealand in order to learn how to run radio broadcasting successfully. No country has more efficient regulation." This high praise by an American journal is held up to scorn by the Auckland writer, whose effusion is a typical sample of this type of Auckland criticism, but can fittingly be ignored.

The American comment is as follows:

"The writer has had the privilege of talking to Mr. J. M. Bingham, the chief engineer of the New Zealand broadcasting system, who is visiting the United States in order to learn the latest in broadcasting practice from American engineers. As a matter of fact, the entire broadcasting industry of the United States might profitably visit New Zealand in order to learn how to run radio broadcasting successfully. No country has more efficient regulation.

"Broadcasting has been placed in the hands of a single company by the authority of the New Zealand Parliament. This company is supported by an annual tax upon broadcast listeners. The purchase of every receiving set and every part which goes into a receiving set, down to the last binding post, is recorded by dealers. Government agents have access to their books at all times. No listener can escape the vigilant eyes of Government inspectors. The revenue thus gained is divided between the broadcasting stations and the Government. No radio advertising or commercial goodwill broadcasting is allowed or necessary.

"One would conclude that, under such an efficient system, with its magic wand to overcome any serious problems and vicissitudes, broadcasting would thrive and grow. Its growth has been steady, but not startling. The number of licenses, in a population of one and a quarter million, is about twenty thousand. Four high-power broadcasting stations cover the four hundred mile length of the country. Interconnecting wire circuits are being developed, but as yet, there is virtually no chain broadcasting. Naturally, with but four stations, there are no frequency allocation difficulties. There is no economic problem in meeting station maintenance cost. There is little or no evasion of listener tax. Altogether, it is the most efficient broadcasting system in the world."

AS IN U.S.A.

WHAT WE MISS IN RADIO METHODS

IN the United States the Radio Stations operate, it is well known, largely through the financial income derived through the sale of advertising "time" or "mention" over the air. This produces a rather curious effect in the insidious way in which tribute is paid to the commercial firms paying for this publicity.

A humorous skit on the effect that would be produced by adoption of the same policy in the case of the daily press appears in a recent issue of the "New York Life." This is sufficiently amusing to be worth reproducing:—

"This is the story of how John Smith, 34 was shot and killed last night by his attractive blonde wife, 18, at their home, 913 West 42 Street, and is available to you through the efficiency of the W. & W. Typewriter, the F. & F. Linotype, and the Gosling Multiple Folding and Counting Press. Mr. Smith was a bookkeeper for the Armour & Montgomery Company, everything for the home, and was shot to death on his return home last evening. The pretty young wife used a Smith & Richardson 'Nevermiss'—they get their man—revolver. The first bullet pierced the husband's heart tearing its way through his natty brown business suit, one of the new winter showing at the Brandywine Broadways Tog Shop.

"Following the shooting, Mrs. Smith summoned the Ochre Cab—they get you there and they get you coming back—and drove her worse half to the Old Souls Hospital which next month starts its annual drive for a five million dollar endowment fund.

"Funeral services for the victim will be held to-morrow from the home—a delightful Californian bungalow effect with brick and stucco walls and tinted tiled roof. Those desiring to say it with flowers will find no better flowers anywhere than at the Whispering Hope Posy Palace.

"This newspaper is printed on mid Maine Triple Ply newsprint by authority of the United States Post Office Department and operates on a column length of 21½ inches."

Sunshine Hour, March 10, for Hospital Children.

In the beautiful new building of the Wellington Hospital provision has been made for wireless to be enjoyed by the inmates. Transfer of the sick to some of the new wards is now taking place, and on March 10—next Saturday evening—the children will for the first time enjoy mass reception from 2YA.

To celebrate the occasion all the Uncles and Aunts associated with 2YA will attend the studio and take part in a gala "sunshine hour." They are busy now thinking up some specially good items for the initial evening, and all may count upon a particularly bright and happy time. All good children should make a point of "listening in."

QUERIES BY CORRESPONDENCE.

1. Every communication enclosing queries is to be addressed to "Megohm," Box 1032, Wellington, and must be accompanied by a stamped addressed envelope for reply by post.

2. Questions must be written so that a space is left in which the reply may be added.

3. No charge is made for replies.

THE C. A. LARSEN ON THE AIR

(To The Editor "Radio Record.")

Sir,—About October last (30th from memory) a strange station was picked up by us. One of your correspondents wrote asking if anyone could tell what it was. One of the items mentioned was a concertina solo. We could not distinguish the station at the time but last night (March 2) we got it again and the announcement was "Hullo! Hullo! Hullo! — calling." After a while we had a message to the effect that the station would appreciate anyone picking up this station to communicate with — — Larsen, Stewart Island, N.Z. (This was as near as we could make it out.) Two items were concertina solo and saw solo (evidently with concertina accompaniment).

Now, Sir, this may have been broadcast from the "C. A. Larsen" or else an individual of this name. Dial readings were just ahead of Wellington. They announced that they would be on the air again on Saturday evening after Wellington had closed down.—W.J.P.

An Inquiry.

G. Sinclair (Dannevirke): On Sunday last, at 11.15 a.m. I tuned on the radio and was very surprised to hear a man singing, so I waited, and finally he stopped. After a long pause, in which no one announced, someone started playing jazz on the piano, which was "Bye, Bye, Blackbird." This did not last long, and I again waited for someone to announce, but all I heard was a click, and whatever station it was, had closed down, and nothing more was heard. Could you tell me whose the station was, or perhaps the readers of the "Radio Record" might have heard the same station, and had heard where it was. The station's wave-length was about 205 metres. Trusting you will have success in locating the station.

WHAT REVENUE?

EXAGGERATED STATEMENTS.

The increase in the number of licenses has been the cause of a misconception in regard to the revenue of the Broadcasting Company. The fact is lost sight of that, as the figures now stand, a large proportion of the licenses are for only portion of the year. Licenses in New Zealand are taken out only to the end of the financial year, which ends on March 31, so that as a consequence many of the 40,000 licenses are only for three or six months, and they all expire on March 31. When, therefore, it has been stated that as the licenses totalled 40,000 the company's revenue was £50,000, the revenue has been greatly exaggerated.

SHORT-WAVE RECEPTION

There seems to be a general tendency to regard the use of an oscillating receiver on the ultra-short waves as quite permissible, and, indeed, many amateurs whose wireless conduct is irreproachable so far as the normal wavebands are concerned have no hesitation in operating their short-wave sets in this condition. It is admittedly difficult to avoid occasional heterodyning of an incoming carrier wave, but, after having calibrated the receiver, there is no real need to interfere with the reception of other listeners on the wavelengths of the more popular stations. If they are coming through at sufficient strength to be really worth while receiving, their signals may be found without operating the reaction control at its limit.

The conscientious amateur should not rest satisfied until his control of regeneration is really smooth; if it is not, it will always be a difficult matter to avoid causing interference, and, moreover, the receiver can never give really satisfactory results.

From the Woman's Point of View.

By VERITY.

TO-DAY AND TO-MORROW

Dressed Decadence.

Every time the modern girl lowers her dress or raises her skirt she supplies a certain type of social censor with fresh evidence of her "decadence." Yet in the recently-issued report of the Resident Commissioner of the Gilbert and Ellice Islands colony we find an emphatic opinion that clothes "have contributed to the moral decadence of the native by stimulating nasty curiosities." This only goes to show how misguided are some well-meaning people who strenuously attack every standard of conduct except that which happens to prevail in their own small corner.

Racing Slips.

Gilbert Frankau is much disturbed over a mistake in his new novel which appeared recently. He has made a girl have a bet on the "tote" for the Melbourne Cup, whereas the "tote" is illegal in Victoria. It doesn't seem a very serious mistake, but he anticipates a volume of correspondence on the subject, and he has had an erratum slip put in 30,000 copies. Once before he made a slip about the Grand National and received bundles of letters on the subject.

Individuality in Dress.

The exclusive dress is like the woman who passes unnoticed in a crowd, but whose charm and beauty is discovered in her own house. There is nothing about it to attract the careless eye of the passer-by except its graceful lines and harmonious colouring. It is a dress of which the wearer does not tire. There is more chance of keeping personality intact when buying from the small and exclusive dressmaker. She may not have a great many models, but each one is thought out carefully. She does not advertise widely—she makes for the individual.

The Woman of Discrimination.

You can tell at a glance if a woman buys her clothes from the exclusive dressmaker. She does not make you think of a big hotel, where everyone is a number—she makes you think of a home. This may sound dull, but it merely means that her taste is not ruled by the fashionable silhouette. She follows fashion with a free mind, and adapts it to her own personality, which is the right and only way to treat fashion when you come to think about it.

Perilous Leap Year.

Leap Year originated with the astronomers in the time of Julius Caesar, but the proposal idea is not quite so ancient. The period during which the unprotected bachelor is in peril of a proposal is a subject on which are held various views. It is said by some that the Leap Year proposal must be made on St. Valentine's Day, February 14, while others declare there is no closing time during the whole year! Again, some hold that any woman who proposes to a man on any date save February 29 is guilty of forward and unbecoming conduct. But in any case, the woman who is capable of proposing in Leap Year is equally capable of doing so at any other time, without, of course, letting her victim be aware of it!

Men's Wear.

Modern woman is so often charged with "apeing the man" that it is only fair to her to notice the fact that there is a new tendency of man to copy Eve in matters sartorial. Woman long ago abandoned the plain, straightforward colours for her wearing apparel, and began to adorn herself, not in plain blue or red, or green, but in brick, rust, jade, thistletuft, storm, cornflower, tomato, cyclamen, etc. And now, according to London West End outfitters, man is following suit. A grey tie is no longer a grey tie—it is "oyster" or "seagull." Green, as green, is a back number. It can be "salad" or "hunter," but never merely green.

A new red is known as "ox-blood," and "currant" is another departure. Ordinary browns are ruled out by "biscuit," "chocolate," or "tobacco."

These shades have not yet extended to suits, but so far are exclusively for shirts, socks, ties, or handkerchiefs.

Howlers from Harrow.

The identity of Boadicea has presented a difficulty to young historians at Harrow School, as the following answers to questions put last term show:—

"Boadicea walked through the town without any clothes on."

"Boadicea was one of Henry VIII's wives."

"Boadicea was Caesar's wife."

"Boadicea was a brave woman, who fought herself and drove a chariot."

It was also recorded that "Domesday Book was a book in which all about the estates was written down, so as to see about taxis."

"Philip had made England Roman Catholic, but when Elizabeth came to the throne England was made Christian."

"Simon de Montfort made John sign Magna Charter and was unfortunately shot in the eye at Evesham."

VERSES

Hidden within the life of each there dwells
Some grief or trouble which we may not know,
Look on the faces passing to and fro,
Surely that furrowed brow a story tells,
Those sad, tired eyes are ever-ready wells
Of unshed tears, or secret springs of woe;
Brave ones, who take the road that Fate compels,
E'en though they walk with weary steps and slow.

Be careful, lest in haste one word we say
Which adds a weight to some poor fainting heart,
Let us be kind and gentle while we may
Ere age or death bids all our chance depart;
Remember, only once we pass this way,
Then let the way be better for our part.

—Adela Wilkins.

TO-DAY AND TO-MORROW

Retaliation.

A story is told of the formidable Dr Jowett, of Oxford fame. On one occasion he asked an undergraduate to take a walk with him. They started out and had proceeded a considerable way in silence when the youth thought he had better say something: "What a fine street this is, Sir!" he remarked, indicating Oxford's "High." "Do you think so?" squeaked the master in his well-known falsetto. Another silence ensued, and at last another remark was ventured: "What a fine view one gets from here, Sir!" "Do you think so?" was again the reply. By this time the youth thoroughly cowed also kept silence; but at last he made a final effort. "What a wide street this is, Sir!" "Do you think so?" came the monotonous refrain. They had now reached Balliol again, and Jowett then turned on the young man and remarked with asperity: "You have made three stupid and obvious remarks, Sir." Whereupon the undergraduate replied "Do you think so?" and fled.

Our Sturdy Forebears.

Our British forefathers were both heavy feeders and heavy drinkers, with the consequence that they were often "out of sorts." That they had good constitutions is shown by the fact that they managed to survive the extraordinary remedies and cures with which they dosed themselves. Here is a fifteenth century cure for "the syetyka." "Take an olde gose agander (goosey gander), within whose bodie you shall put all the flesch of a catte well brokyn, alsoe a swyne foot with the klee (hoof) on, adding thereto vyrgin wex (wax), sewt, honey and salte. Then will the drippings of the gose be not onlie a medecine againste the syetyka, but also a presyas oyntement for the gowte."

A "Wireless" Wireless.

Many a woman, proud of her home, has forgone the joys of a Wireless Set. Those unsightly wires, those devastating nails and clips! No! She could never have such disfigurements about her home—just fancy her house looking like the outrigging of a ship gone adrift! Still, she thinks the musical evenings are so delightful. To her, then, glad will be the news that a set has recently come into being—the "Trav-ler" Portable by name—which is entirely innocent of wires; a set with no attachments whatever. Neat, compact, exceptionally free from "howling," of 5-valve capacity—just a turn of its dials and you have entertainment of the best. Can be carried from room to room, or taken with you on a friendly visit. And the price is only £27 10s. Ask a dealer for a demonstration of the "Trav-ler."

Kill or Cure!

From Gerarde writing in 1598 we gather that: "Woundwort or Allheale seeds ground to powder and drunke in Wormwood wine, is good against poison, the bite of madde dogs, and the stinging of all manner of wilde beasts."

"The leaves or rootes stamped with honie, and brought to the forme of an unguent or salve, cureth woundes and ulcers of great difficultie, and covereth bones that are bare or naked without flesh."

"Otemeale is good for to make a faire and well coloured maide to look like a cake of tallow, especially if she take a good draught of vinegar after it."

The rootes of the mead saffron, the white excepted, are very hurtful to the stomache, and being eaten they kill by choking, as musromes do. Those who have eaten must drink the milke of a cow, or death presently ensueth.

Co-operation of Teachers.

At the conference of educational associations at University College recently, demonstrations of lessons by wireless were given by arrangement with the British Broadcasting Corporation.

"We claim to be able to strengthen the staff of a school anywhere by providing a fresh outlook and fresh voices," said Mr. J. C. Stobart, director of education to the B.B.C., in an explanatory address. "The effect of this on English composition and vocabulary is most marked."

Wireless could not possibly replace the living teacher, and it could only obtain its full effect with the hearty co-operation of the teacher.

A lesson on "Boys and Girls in the Middle Ages," by Miss Rhoda Power, broadcast from 2LO, was delivered to the conference by loudspeaker. A party of schoolgirls were present, under their mistress, who showed how co-operation was carried on between the teacher in the class and the wireless lecturer. The lecture was illustrated musically by mediaeval songs, with effects, which were explained to the class in an undertone by the teacher.

Sir Walford Davies followed with a specimen broadcast lesson on "Elementary Music." The teacher stood by at the blackboard to illustrate the lesson according to the lecturer's requirements.

The Letters of Annabel Lee

My dear Elisabeth:

Picture plays there are that transport one to a land of romance, others like "The Bat" give a genuine thrill, and some are merely boring in washy sentiment or blatant vulgarity. For sheer rollicking fun, however, it would be hard to surpass "The Kid Brother" now showing. Mr. Harold Lloyd knows his metier and sticks to it, and delightfully amusing he is, with an appeal quite definite, his art, in the opinion of many critics, surpassing that of Charlie Chaplin. Mr. Lloyd's engaging smile is a considerable asset, possessing an ingratiating quality that goes to the heart of weak woman.

Also visited this week was the Britannia Theatre, where Mr. Rod la Rocque swaggered and made excellent sword-play as Brigadier Gerard. Very attractive was the valiant braggart and the lady to whom he paid deferential and masterful court was portrayed by an actress of considerable fascination, a rare quality in a picture and out of it. Miss Phyllis Haver looked a lovely coquette in picturesque hat with sweeping plumes and the high-waisted, clinging gowns of the Napoleonic era. The great Corsican found surprisingly good representation, looking uncannily like the familiar pictures. All very dashing and daredevil and unreal as a page out of those books of our brothers we used to steal in our very young youth, and devour in some sunny, solitary spot with beaming eyes and bated breath.

Very intriguing are the autumn modes, even though displayed on days when the sun shines with enthusiasm and the heat approaches tropical fervour. The new line of coat is viewed with favour, particularly a graceful clasping front effect, and strange, colourful fur and feather garnitures, such as never grew on beast or bird. Striking a new note are many jumper frocks, some appliqued with skill, others of sober hue relying on elegance of line and loveliness of material so it would seem, that we shall go bravely clad when winter comes. One coat greatly furbedizened was of bottle-green velour, its curving gracefulness heightened with rows of infinitesimal tucking, which swathed themselves round their temporary home on a waxen lady, finding bourne in a gleaming buckle that was almost jade.

One night I dined with L——, lately widowed and inconsolable. Wearing a gown of black, with long strands of jet that rippled its entire length, with silvering hair and aloofness of gaze, she presented a picture in the miniature genre, the effect heightened by a wonderful clasp of diamonds that invited one to envy. This ornament of great beauty and value, she told me, was fashioned from an old-fashioned locket of the Victorian era, huge, elaborate and dull. The stones were re-set by a clever worker in gems, the result being a jewel lovely enough to flash from the brows of Cleopatra herself.

'Tis regrettable that cream-coloured gowns and garments for so long have been done out of their own, so helpful and becoming are they to all ages of women. One remembers how lovely appeared Dame Ellen Terry, her glorious youth then but a memory, when she visited our far-flung islands. Clad in trailing draperies of ivory velvet, the contour of face and head recalling memories of perfect presentment of Shakespeare's most adorable women, Miss Terry held our hearts in the hollow of her hand, even when she forgot her lines in the potion scene and apologised most sweetly for the lapse. But yesterday it happened that my eye lighted on an enveloping coat of creamy marocain, horizontally striped across skilful slimness, the large and undulating collar hailing from some imaginary region of the Antarctic, the entire ensemble eminently suited to the blonde maiden who walked in beauty on the Quay, an astonishingly tiny black velour rammed down upon golden earlocks, the whole suggestive of a black and white drawing by Aubrey Beardsley.

How interesting was a window recently dressed to exemplify an inspiring world-wide movement. Against a background of banners of the different branches stood a perfectly turned out figure of a Girl Guide, navy blue suit, slouch hat, leather belt, gloves smartly thrust therein, all very workmanlike and attractive. Much do I admire the detached and purposeful demeanour of the members of this admirable body, as they go their way, from the dear small Brownies to the Commanding Personalities that are as the Olympians. Their obvious aloofness and capacity to mind their own business, unheeding that of others, is surely the better part of good manners, as well as the sign and symbol of fine ambitions and worthy ends.

Why it is that attractive women bring upon their heads the verbal slings and arrows of the Unimpeachable, the Wowser and the Dud? Wit, charm, elusive appeal sometimes vaguely labelled S.A., all add to the sparkle of life, which is short at best, and apt to be dull? Recently at a function Clarissa was a success. Clad in a gown of her favourite blue, that is neither cornflower nor periwinkle, but a kind of midnight effulgence between the two, fashioned by her own clever stitchery, with her poise of mind and swift wit, she was much appreciated and had an hour of social success—only a comma, so to speak, in the long and strenuous pages of the chronicle of her days. A dowdy matron eyed her. "Clarissa must be fifty-five, and looks it by daylight!" quoth she, infusing as much vitriol into her remark as Mr. Holland in his remotest reference to Samoa.

I am deep in The Journal of Katherine Mansfield. What a genius was this girl, who went forth from our young country, and through years of experience most bitter, ill health and a frugality that was almost poverty, held to the great light vouchsafed to her by the high gods. In the Journal, most intimately reminiscent of a life which ran its brief span in thirty-two years, lived to the hilt in emotion and achievement, we view the world as seen through the eyes of this greatly-gifted girl. Fascinating to a degree is the revelation of a spirit beyond our ken, but not beyond our admiration, and, although with a sense of prying at revealed intimacies that are no business of ours, we read on, thrilling to manifestations and imagery of extraordinary sensitiveness and brilliance, allied with a strange and beautiful translucence of expression. It is as though that quivering awareness were a spiritual canvas flooded with the true colour and suggestiveness of a world that for most of us has lost radiance and spiritual meaning. Nobly generous of nature, idealistic, quixotically true to the light of truth that flamed within her pain-racked body, Katherine Mansfield sets forth her rainbow-hued thought in lovely sequence for the delight and bedazzlement of minds more pedestrian, eyes that as yet see but as through a glass darkly.

Your

ANNABEL LEE.

A Novelty.

A new device which will make a sure appeal to the carver of joints is the claw-shaped carving fork. Fashioned with two strong prongs on one side and three on the other, the most difficult joint or bird becomes an easy proposition. The claw holds firmly anywhere, and there is no need to remove the fork to allow the knife to pass under; the front prongs are raised, while the back holds firmly.

A Cake for the Children.

Three teacups flour, 1 cup of milk, 2oz. of butter, ½lb. sultanas, 3oz. chopped peel, 4 eggs, 2 cups sugar, 4 teaspoons baking powder. Method: Rub butter lightly into flour and baking powder, stir in beaten eggs, then add fruit and sugar. Add sufficient milk to make fairly slack, and bake in a moderate oven for two hours.

The Music Room.

The music room is a feature of modern hotel and accommodation-house design, but architects are now going further than this. They are providing the latest hotels in big cities of the world with radio rooms, some of which take the form of a small auditorium where patrons can sit and enjoy whatever is supplied from the loudspeaker. House design, too, has taken radio into consideration, and in America private dwellings are wired for radio reception as they are erected, while concealed wiring and plug-in points enable a loudspeaker to be transferred from room to room without the inconvenience of extension wires.

Monologue.

A monologue is a conversation between a motor salesman and a possible purchaser.

Atmosphere.

A tramp at Uxbridge Workhouse (England) whose coat and trousers were in rags and tatters, and which had 100 patches thereon, refused the offer of a new suit on the ground that it looked "too civilian." Professional experience had evidently taught him the value of atmosphere.

Old Wives' Tales.

He was a much-divorced film star, and was proposing for the sixth time. "Don't listen to any of the stories told about me," he urged. "They's only old wives' tales."

A Use for Old Gramophone Needles.

Old gramophone needles make excellent brads for making secure the backs of pictures and photograph frames.

Breast of Lamb.

One breast of lamb, half-teaspoon sweet herbs, half grated lemon rind, 1 teaspoon parsley, a dust of nutmeg and mint, salt and pepper, 1 egg, 1½oz. butter, 4 tablespoons breadcrumbs, 1oz. flour, 2 tablespoons chopped suet, 1 pint water, one onion.

Method: Bone neatly the breast of lamb, taking care not to break the outer skin. Make a forcemeat of breadcrumbs, suet, sweet herbs, parsley, nutmeg, mint, lemon rind, and seasoning, all mixed with the beaten egg. Spread this on the breast, roll up, and tie or skewer into a good shape. Heat the butter in a stewpan or casserole, put in the breast, also the bones, and a blade of mace. Cover with a closely-fitting lid, put in the oven, and cook for 1¼ hours. Dish the breast in the centre of a hot dish with a border of peas round. Remove the fat from the gravy, strain a little over, and serve the remainder in a tureen.

Irish Programmes at All Stations for St. Patrick's Day

NEXT week will be Irish week at the Stations. That being so, one may appropriately say that the ether will never have been so full of Irish airs before. St. Patrick's Day happens next week and the songs of the Emerald Isle which will monopolise the programmes at the stations on various nights will permeate New Zealand. All stations will broadcast Irish entertainments on Saturday, St. Patrick's Day, and in addition 1YA and 3YA have special Irish programmes, the former on Tuesday and the latter on Thursday. At 1A Madame Irene Ainsley is producing "The Lily of Killarney" and at 3YA Madame Gower-Burns's Grand Opera Quartet is submitting a very attractive Irish programme. High in the esteem of all who love Irish songs stands Tom Moore, who by frequently writing his poems to traditional airs did much to keep the melodies in circulation among the people. Everyone knows "The Minstrel Boy," that song of burning patriotism, "The Harp That Once Through Tara's Halls," "Kathleen Mavourneen," "Killarney." These, and many others will be broadcast next week.

"LILY OF KILLARNEY" AT 1YA

"The Lily of Killarney" is to be the next opera to be produced by Madame Irene Ainsley at 1YA. The section chosen for Monday is to be the "Kitchen Scene."

This opera, which is full of good Irish tunes, is founded on Dion Boucicault's play, "The Colleen Bawn." Older generations will remember that it was played in New Zealand by the Alice May Opera Company in the seventies. Sir Julius Benedict was a German who followed in the steps of Handel by spending a great deal of his life in England. He is remembered chiefly by "The Lily of Killarney."

It may be said that the whole programme for Monday is Irish, for, apart from the songs in "The Lily of Killarney," others that are redolent of the air of Erin will be sung. These include: "Kathleen Mavourneen," "The Minstrel Boy," "Danny Boy" and "Casey the Fiddler."

The cast for "The Lily of Killarney will be:—

Elly: Miss Irene Ainsley;
Sheila: Madame Irene Ainsley;
Haedress Cregan: Mr. Robt. Peter;
Miles va Coppaleen: Mr. Wilson;
Father Tom: Mr. Walter Brough.

A special Irish programme will be broadcast from 1YA on Saturday evening, the vocalists being the Madame Mary Towsey Quartet. The songs will be essentially Irish, as befitting the occasion, St. Patrick's Day. The elocutionary items of Mr. J. F. Montague will also be appropriate, while Mr. J. J. Sullivan, an Auckland solicitor, will give a talk on "Old Ireland."

The instrumental trio will play the "Londonderry Air."

Songs to be sung by the quartet, which comprises, Madame Mary Towsey, Miss Gwenyth Evans, Mr. John Bree and Mr. P. Rose, include many of the old favourites, as a glance at the programme will show.

WELLINGTON TOWN HALL CONCERT

St. Patrick's Day will be celebrated by a relay of the Irish concert from the Town Hall. This is one of the musical events of the year, and the organisers on this occasion have provided a "bill of fare" right up to the standard of "the best-ever."

The programme will, of course, be of a national character. It will include airs familiar to the sons and daughters of the Emerald Isle played on the great organ; choruses by the Marist Bros. School Choir, and other delightful numbers. The contributing vocalists will include Miss Frances Morrison, of Blenheim; Mr. G. H. Andrews, of Timaru (baritone); Mr. Dan Faley (tenor); Miss Wheelan (mezzo-soprano); Miss Nora Greene (contralto) and Mr. William Renshaw (tenor). Mr. Leon de Mauny (violinist) and Miss Phyllis McMillan who will appear in dancing specialties, will also contribute to the evening's enjoyment.

The children's session at 2YA will also observe St. Patrick's Day. Auntie Gwen and Auntie Dot will have the Buckle Street Convent assisting them with the choruses appropriate to the occasion.

AS the Patron Saint of Ireland, St. Patrick is acclaimed with enthusiasm throughout every country where the English language is spoken, and nowhere, of course, with such affection as in Ireland.

The shamrock, or small white clover, is almost irreverently worn in the hat all over Ireland on St. Patrick's Day. The popular notion is that when St. Patrick was preaching the doctrine of the Trinity he used this plant bearing three leaves upon one stem, as a symbol or illustration of the great mystery.

ALMOST as many countries arrogate the honour of having been the natal soil of St. Patrick, as made a similar claim with respect to Homer. Scotland, England, France and Wales, each furnish their respective pretensions; but, whatever doubts may obscure his birthplace, all agree in stating that, as his name implies, he was of a patrician family. He was born about the year 372, and when only sixteen years of age, was carried off by pirates, who sold him into slavery in Ireland where his master employed him as a swineherd on the well-known mountain of Sleamish, in the county of Antrim. Here he passed seven years, during which time he acquired a knowledge of the Irish language, and made himself acquainted with the manners, habits and customs of the people. Escaping from captivity, and after many adventures reaching the Continent, he was successively ordained deacon priest, and bishop; and then once more, with the authority of Pope Celestine, he returned to Ireland to preach the Gospel to its then heathen inhabitants.

ANTAGONISTIC DRUIDS.

THE principal enemies that St. Patrick found to the introduction of Christianity into Ireland were the Druidical priests of the more ancient faith, who, as might naturally be supposed, were exceedingly adverse to any innovation. These Druids, being great magicians, would have been formidable antagonists to any one of less miraculous and saintly powers than Patrick. Their obstinate antagonism was so great, that in spite of his benevolent disposition he was compelled to curse their fertile lands, so that they became dreary bogs; to curse their rivers so that they produced no fish; to curse their very kettles, so that they with no amount of fire and patience could ever be made to boil; and, as a last resort, to curse the Druids themselves so that the earth opened and swallowed them up.

A popular legend relates that the saint and his followers found themselves, one cold morning on a mountain, without a fire to cook their breakfast, or warm their frozen limbs. Unheeding their complaints Patrick desired them to collect a pile of ice and snowballs; which having been done, he breathed upon it, and it instantaneously became a pleasant fire.

The greatest of St. Patrick's miracles was that of driving the venomous reptiles out of Ireland, and rendering the Irish soil, for ever after, so obnoxious to the serpent race that they instantaneously die on touching it. Colgan seriously relates that St. Patrick accomplished this feat by beating a drum, which he struck with such fervour that he knocked a hole in it, thereby endangering the success of the miracle. But an angel appearing mended the drum; and the patched instrument was long exhibited as a holy relic.

SNAKE SUPERSTITIONS.

IN 1831, Mr. James Cleland, an Irish gentleman, being curious to ascertain whether the climate or soil of Ireland was naturally destructive to the serpent tribe, purchased half a dozen of the common harmless English snake (natrix torquata), in Covent Garden Market in London. Bringing them to Ireland, he turned them out in his garden at Rath-gael, in the county of Down; and in a week afterwards, one of them was killed at Milecross, about three miles distant. The persons into whose hands this strange monster fell, had not the slightest suspicion that it was a snake, but considering it a curious kind of eel, they took it to Dr. J. L. Drummond, a celebrated Irish naturalist, who at once pronounced the animal to be a reptile and not a fish. The idea of a "rale living sarpint" having been killed within a short distance of the very burial-place of St. Patrick, caused an extraordinary sensation of alarm among the country people. The most absurd rumours were freely circulated, and credited. One far-seeing clergyman preached a sermon, in which he cited this unfortunate snake as a token of the immediate commencement of the millennium; while another saw in it a type of the approach of the cholera morbus.

Old prophecies were raked up, and all parties and sects, for once, united in believing that the snake foreshadowed "the beginning of the end," though they very widely differed as to what that end was to be. Some more practically minded persons, however, subscribed a considerable sum of money, which they offered in rewards for the destruction of any other snakes that might be found in the district. And three more of the snakes were not long afterwards killed, within a few miles of the garden where they were liberated. The ramaining two snakes were never very clearly accounted for; but no doubt they also fell victims to the reward.

On the Galtee or Gaultie Mountains, situated between the counties of Cork and Tipperary, there were seven lakes, in one of which, called Lough Dilveen, it is said Saint Patrick, when banishing the snakes and toads from Ireland, chained a monster serpent, telling him to remain there till Monday.

ST. Patrick is commonly stated to have died at Saul on March 17, 493, in the one hundred and twenty-first year of his age. As the birthplace of St. Patrick has been disputed, so has that of his burial. But the general evidence indicates that he was buried at Downpatrick, and that the remains of St. Columb and St. Bridget were laid beside him.

IRISH VARIETY AT 3YA

At 3YA, St. Patrick's Day programme commences at the children's session when little cousins from the Ferry Road Convent will come along to the studio to help Uncle Sam and Aunt May. Among the items to be sung will be "The Dear Little Shamrock" by the children of the Primary School and "The Royal Ambassador's March" will be played by the Ferry Road Convent Boys' Orchestra.

The evening session programme will provide an entertainment of the popular kind, being bright and of much variety. The artists include Mr. E. A. Dowell, who always sings favourite songs; Mrs. D. W. Stallard, Miss Mabel Thomas, Mr. Dave McGill, Mr. Ivan Perrin (popular Irish melodies), Mr. Jack Oxley (zither banjo), Mr. E. A. Sargent (songs at piano), the Broadcasting Trio—and Mr. James Laurenson, who will deliver an Irish speech and recite an Irish poem.

On Sunday evening the studio concert following the broadcast of the service at the Church of Christ, will not be without its Irish element. This will be evident in the two songs to be sung by Mr. Frank O'Brien. This Sunday evening concert will, however, comprise many other good items by Miss Constance Flamank (contralto), Miss Maiona Juriss, A.T.C.L. (elocution), Miss Bessie Pollard, A.T.C.L., L.T.C.L., (pianoforte), and Mr. Frank Morrison (tenor).

An Irish concert by the Madame Gower-Burns Grand Operatic Quartet will be an entertainment worth tuning-in for. The programme shows that a fine selection has been made from the many charming melodies composed in and about Erin.

Madame Gower Burns's solo items will include "The Last Rose of Summer," "Killarney," "A Little Bit of Heaven,, and "Come Back to Erin," songs which she can be relied upon to render with all the artistic treatment and expression for which she is noted. Mrs. Ann Harper, who is taking the place of Miss Jessie King, who is about to leave for England, will sing the fascinating "Kerry Dance," "Husheen" and "The Four-Leafed Clover." Both Mr. Rennell and Mr. Prescott have songs to suit their voices. The quartets for the evening will be particularly good.

Irish airs will be played by the Broadcasting Trio and by Miss Aileen Warren, while Irish recitations will be given by Mr. H. Instone.

4YA's IRISH CONCERT

The programme shows that the Scottish entertainers of Dunedin have responded well for St. Patrick's Day, for a concert of much variety as well as of a high musical standard has been arranged. Many of the old favourites will be sung, the vocalists being Miss Florence Sumner (soprano), Miss Irene Hornblow, R.A.M (contralto), Mr. A. Lungley (baritone) and Mr. R. A. Mitchell (tenor). Instrumental items of an Irish character will be contributed by Mr. Stewart (flute), Mr. A. R. Watson (violin), and Mr. Geo. Christie (cornet).

An address on the "Music of Ireland" will be given by Mr. J. P. Ward.

"GOOD" MUSIC

SYDNEY PIANIST'S COMMENT.

"The term 'good' music is often abused," says Mr. Chapple, a prominent Sydney pianist. "Much agitated argument has centred on the desirability of excluding jazz from broadcasting programmes, on the ground that it is a low order of harmony. Yet, Gorshwin's 'Rhapsody in Blue' is just as much a classic of its kind as the Unfinished Symphony.

"The trouble of it is," he continued, "so many people emphasise their preference for the masters because it is considered the correct thing to do. They have probably listened to compositions which bored them unutterably, but because of their alleged classic origin, so far from voicing a protest, they express hypocritical appreciation. With unsympathetc treatment, good music can degenerate into very bad music. Through interpretation, the artist creates an honest response in his audience, despite the formidable obstacles of catholic taste and limited musical education."

Full Programmes for Next

NOTES AND COMMENTS

(By "Switch.")

Accumulator terminals collect substances which in spite of cleaning always return. This is due to the electrolyte, so that it should always be wiped away from the top of the battery, and the terminals given a regular cleaning now and again.

When soldering always place a piece of paper on the baseboard to catch any drops of solder that might otherwise mar the board.

Heat so great that steel metals evaporate as readily as alcohol in a still is now capable of being generated in a new high-frequency vacuum furnace, which utilises the same electric currents as those employed in radio communication. Current of a frequency corresponding to a wavelength of ten thousand metres is sent through a coil inside a vacuum bell, creating a heavy oscillating magnetic field. If a metal is placed within the coil so that it absorbs most of this energy, the frenzied atoms generate such frictional heat in responding to the changing magnetic field that the metal is liquefied and gasified in less time than it will take the reader to read this paragraph.

When drilling a panel, particular care should be taken, as the look of the panel will either make or break the finish of your set. In order that the drill does not slip, the places for the holes should first be marked with a centre punch. A drill smaller than the hole desired should be used first, in order that tearing of the panel does not occur. Where possible, a template should be used so that the correct size holes can be cut, and each component correctly spaced.

When an earth is connected to an outside tap or water pipe, it will be necessary, unless the joint be well soldered and insulated, to inspect it frequently, as corrosion will otherwise set in, and cause bad contact. Insulation tape, being waterproof, is probably the best insulation to use on an outside connection. But it is always best to solder your earth wire to the water-pipe.

A correspondent writes to the Sydney "Wireless Weekly":—"Your correspondents who find Sunday church services such a distasteful subject should remember that if their requests were granted, and what one lady refers to as 'Bible banging and canting' were cut out of the Sunday programmes, fully 95 per cent. of the Sabbath listening public and many outback homes, who have no means of hearing church service, would be deprived of Divine worship and very enjoyable choral singing and also the beautiful organ accompaniments."

The Roman Catholic Church in New South Wales has engaged the B class broadcasting station 2UE, Sydney, for two hours on three nights a week. 2UE operates on 293 metres with a power of 250 watts on Tuesday, Thursday and Sunday evenings. The station is operated by Radio House, 617 George Street, Sydney.

When soldering leads in your set, the iron should never be allowed to get red hot. This will burn away the tinning, besides being far too hot for practical use. To tin your iron again will take time, so always give it due attention, never forgetting to wipe it on an old clean rag immediately it leaves its source of heat.

An Australian radio writer says: "Impossible advertisements have a great deal to do with the supposition that wireless transmission and reception have improved. The firms of to-day, particularly those in America, seem to have a strain of exaggeration about them. The over-statements of some of the American firms would lead one to believe that radio has reached the end of its tether as far as advancement is concerned, yet Marconi, the actual original instigator—or rather, I should say, discoverer of the characteristics of wireless waves—is most emphatic about the advancement of these subjects, and strongly avers that there is still plenty of room for improvement."

Scotland Yard authorities have now decided to make the fullest possible use of wireless in their efforts to curb the activities of criminals, and the fast motor-cars which have been specially assigned to the flying squad have been equipped with wireless sending and receiving apparatus. A course of instruction in the Morse code has also been started, and batches of detectives attend the wireless room at police headquarters to receive lessons in the mysteries of dots and dashes.

By soaking a small strip of cardboard in Indian ink and then clamping each end to a terminal, a good grid leak can be made. By gradually cutting off a little from each side, the best thickness for the proper resistance may easily be found.

In Australia a wireless license entitles the licensee to use wireless in the premises occupied by him at the address mentioned in his license. One license will cover any number of sets installed on the same premises for the use of the licensee, his family, or his servants. It should be noted, however, that if any other person occupying a portion of the same house under a separate tenancy desires to install apparatus, he must take out a separate license.

Sunday, March 11th

1YA AUCKLAND (333 METRES)—SUNDAY, MARCH 11.

3 p.m.: Afternoon session—Selected studio items.
4.0: Literary selection by Mr. Culford Bell.
4.30: Close down.
6.0: Children's hour.
6.55: Relay of church service from St. Mary's Cathedral. Preacher, Canon P. James; organist, Mr. E. Randall.
8.30: Relay of municipal organ recital from Town Hall; organist, Mr. Maughan Barnett.
9.30: A thought.
9.31: Close down.

2YA WELLINGTON (420 METRES)—SUNDAY, MARCH 11.

6 p.m.: Children's service, conducted by Uncle Ernest.
6.55: Relay of evening service from Church of Christ, Vivian Street. Preacher, Pastor W. G. Carpenter; organist, Miss Phyllis Ladbrook.
8.30: Studio concert.
Vocal quartet—The Wm. Renshaw Quartet, "The Day Thou Gavest" (Woodward).
Instrumental quartet—Symons-Ellwood-String Quartet, "Largo from E Major Quartet" (Haydn).
Tenor solos—Mr. Wm. Renshaw, (a) "Oft in the Stilly Night" (Irish air); (b) "Believe Me If All Those Endearing Young Charms" (Irish Air).
Contralto solos—Miss Nora Greene, (a) "The Praise of God" (Beethoven); (b) "Golden Days" (Sullivan).
Instrumental quartet—Symons-Ellwood String Quartet, "Andantino" (Lemare).
Soprano solo—Mrs. Amy Dunn, "Home, Sweet Home" (Bishop).

3YA CHRISTCHURCH (306 METRES)—SUNDAY, MARCH 11.

5.45 p.m.: Children's song service—Uncle Sam, assisted by children of St. Luke's Sunday School, under direction of Archdeacon Taylor.
6.39: Relay of evening service from Trinity Congregational Church. Special Preacher from the New Zealand Congregational Conference—the Rev. Lionel Fletcher. Organ and vocal solos will be given at close of service.
8.15: Tenor solos—Mr. A. R. Thompson, (a) "Comfort Ye, My People" (Handel); (b) "Every Valley Shall Be Exalted" (Handel).
8.22: Pianoforte solos—Miss Maud K. Stout, (a) "Hexentanz, B Minor" (Macdowell); (b) "Sous Bois, D Flat Major" (Barratt).
8.28: Soprano solos—Miss Ella Skurr, (a) "Angels Ever Bright and Fair" (Handel); (b) "Come Unto Him" (Handel).
8.33: Cornet solo—Mr. Fred Fox, selected.
8.37: Baritone solo—Mr. A. G. Brown, "The Sailor's Prayer" (Peel).
8.41: Tenor solos—Mr. A. R. Thompson, (a) "My Task" (Ashford); (b) "The Star of Bethlehem" (Adams).
8.47: Pianoforte solo—Miss Maud K. Stout, "Rondo Capriccioso, E Minor" (Mendelssohn).
8.52: Soprano solo—Miss Ella Skurr, "Ave Maria" (Kahn).
8.56: Cornet solo—Mr. Fred. Fox, selected.
9.0: Baritone solo—Mr. A. G. Brown, "The Fortune Hunter" (Willeby)
God Save the King.

4YA DUNEDIN (463 METRES)—SUNDAY, MARCH 11.

5.45 p.m.: Children's song service—Big Brother Bill, assisted by the choristers of the Anglican Cathedral.
6.30: Relay of service from St. Paul's Cathedral. Preacher, Canon Nevill; organist, Mr. W. E. Heywood, F.R.C.O.
8.0: Studio concert.
9.0: Close down.

Monday, March 12th

1YA AUCKLAND (333 METRES)—MONDAY, MARCH 12.

SILENT DAY.

2YA WELLINGTON (420 METRES)—MONDAY, MARCH 12.

3 p.m.: Chimes of the G.P.O. clock.
3.1: Selected gramophone items.
3.30: Lecturette on "Fashions," by a representative of Kirkcaldie and Stains, Ltd.
3.45: Selected gramophone items.
5.0: Close down.
6.0: Children's hour—Uncles Toby and Jeff, programme of selected items by members of Queen Margaret College, under the direction of Mr. Len. Barnes, choruses, duets, recitations, and birthday greetings.
7.0: News session, market reports, and sports results.
7.40: Lecturette on "Books: Grave and Gay," by Mr. H. C. South.
8.0: Chimes of the G.P.O. clock.
8.1: Overture—"Light Cavalry" (Suppe).
8.5: Vocal quartet—Celeste Quartet, "Bridal Chorus" from "Lohengrin" (Wagner).
8.9: Flute solo—Mr. L. W. Rothwell, "Salut d'Amour" (Elgar).
8.14: Bass solo—Mr. Wm. Boardman, "Red Rose" from "Monsieur Beaucaire" (Messager).
8.18: Elocutionary—Mr. Stanley Warwick, "The Longshoreman" (Caine).
8.23: Instrumental trio—Symons-Ellwood-Short Trio, "First Movement Trio in E Flat, Op. 1" (Beethoven).
8.33: Vocal duet—Misss Mabel Dyer and Mr. Edgar Swain, "Home to Our Mountains" from "Il Trovatore" (Verdi).
8.38: Violin solos—Miss Ava Symons, (a) "Caprice Viennois" (Kreisler); (b) "Rondino" (Beethoven-Kreisler).
8.44: Soprano solo—Miss Myra Sawyer, "One Fine Day" from "Madame Butterfly" (Puccini).
8.48: Cornet solo—Mr. H. Dutton, "La Belle Americaine" (Hartman).
8.54: Tenor solo—Mr. Edgar Swain, "On With the Motley" from "Pagliacci" (Leoncavallo).
8.59: Weather forecast.
9.0: Lecturette—Miss Maynard Hall, "Reminiscences of Hollywood."
9.12: Flute solo—Mr. L. W. Rothwell, "First Valse" (Durand).
9.16: Vocal duet—Miss Myra Sawyer and Mr. Wm. Boardman, "A Paradise for Two" from "Maid of the Mountains" (Tate).
9.20: Instrumental trios—Symons-Ellwood-Short Trio, (a) "None but the Weary Heart" (Tschaikowsky); (b) "Boating Song" (Tschaikowsky).
9.30: Elocutionary sketch—Mr. Stanley Warwick, "The Stranger" from "More Ever Ready Plays" (Peach).
9.40: Violin solo—Miss Ava Symons, "First Movement of Second Concerto" (Wieniawski).
9.45: Contralto solo—Miss Mabel Dyer, "I Wept, Beloved" (Hue).
9.50: Cornet solo—Mr. H. Dutton, "Because" (d'Hardelot).
9.55: Vocal quartet—Celeste Quartet, "O, Happy Eyes" (Elgar).
God Save the King.

3YA CHRISTCHURCH (306 METRES)—MONDAY, MARCH 12.

3 p.m.: Afternoon session—Selected studio items.
4.30: Close down.
6.0: Children's hour—Uncle Jack and Aunt Edna, birthday greetings, stories, and songs.
7.15: News and reports.
8.0: Chimes. Relay of orchestral selections from the Strand Picture Theatre Orchestra, under the conductorship of Mr. Harry Ellwood.
Studio concert by Derry's Military Band, under the conductorship of Mr. E. C. Derry, assisted by 3YA artists.
8.10: Male voice quartet—Beckenham Quartet, "An Evening's Pastoral" (Shaw).
8.13: March—Band, "Preciosa" (Devery).
8.18: Tenor solo—Mr. E. R. Pitman, "House Hunting" (Cecil).
8.21: Waltz—Band, "Appassionata" (Ketelby).
8.27: Humorous recitation—Miss Mavis Ritchie, "Castles in the Air" (West).
8.32: Selection—Band, "Chocolate Soldier" (Strauss).
8.42: Humorous male voice part-songs—Beckenham Quartet, (a) "The Soldier's Farewell" (Kinkel); (b) "Sussanah Snooks" (Lincoln Hall).
8.49: Intermezzo—Band, "A Reverie" (Ord Hume).
8.55: Male voice trio—Messrs. Archer, Pitman, and Jackson, "A Little Farm, Well Tilled" (Hook).
8.59: Weather report.
9.0: Relay of orchestral music from the Strand Picture Theatre.
9.5: Male voice part-songs—Beckenham Male Quartet, (a) "Massa's in the Cold, Cold Ground" (Foster); (b) "Pa Shaved Off His Whiskers" (Hall).
9.12: Flower gavotte—Band, "Hearts and Flowers" (Tobane).
9.16: Baritone solo—Mr. W. H. Odell, "Once in the Long Twilight" (Horne).
9.20: Selection—Band, "Girls of Gottenburg" (Godfrey).
9.30: Humorous recitation—Miss Mavis Ritchie, "Keeping a Seat at a Matinee" (M.S.).
9.34: Fox-trot—Band, "Collette" (Baer).
9.39: Male voice duet—Messrs. F. S. Jackson and W. H. Odell, "Sweet Genevieve" (Tucker).
9.42: Humorous male voice quartet—Beckenham Quartet, "When Father Laid the Carpet on the Stairs" (Nelson Jackson).
9.45: Minuet—Band, "Minuet in G" (Beethoven).
9.50: Male voice part-song and chorus—Beckenham Quartet, (a) "Good Night, Ladies"; (b) "Topical Chorus" (M.S.).
9.56: March—Band, "Distant Greeting" (Doring).
God Save the King.

4YA DUNEDIN (463 METRES)—MONDAY, MARCH 12.

SILENT DAY.

Tuesday, March 13th

1YA AUCKLAND (333 METRES)—TUESDAY, MARCH 13.

3 p.m.: Afternoon session—Selected studio items.
3.30: Talk on "Cooking by Electricity," by a representative of Turnbull and Jones.
4.0: Literary selection by the Announcer.
4.30: Close down.
6.0: Children's hour—Uncle George, birthday greetings, songs, and stories.
7.15: News and reports.
8.0: Chimes.
8.1: Relay of orchestral overture from the Majestic Theatre Orchestra, under conductorship of Mr. J. Whiteford-Waugh.
8.11: Contralto solo—Madame Irene Ainsley, "Kathleen Mavourneen" (Crouch).
8.16: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Finale from Trio in D Major" (Reinecke).
8.25: Tenor solo—Mr. Robert Peter, "The Minstrel Boy" (Old Irish).
8.29: Relay of musical interlude from Majestic Picture Theatre Orchestral.
8.34: Soprano solo—Miss Irene Rogers, "I'm Alone" from "Lily of Killarney" (Benedict).
8.38: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Samson and Delilah" (Saint-Saens).
8.45: Talk on "League of Nations: Child Welfare Work," by Mr. E. C. Cutten, S.M.
9.0: Weather forecast.
9.2: Relay of vocal interlude from the Majestic Picture Theatre.
9.7: Violin solo—Miss Ina Bosworth, selected.
9.11: Contralto solo—Madame Irene Ainsley, "Danny Boy" (Old Irish).
9.16: Baritone solo—Mr. Walter Brough, "Casey the Fiddler" (Wood).
9.19: Instrumental trio—Bosworthy-Hemus-Towsey Trio, "Finale from Trio No. 4" (Mozart).
9.29: Kitchen scene from "The Lily of Killarney" (Benedict), produced under the direction of Madame Irene Ainsley. Cast: Eily, Miss Irene Rogers; Sheila, Madame Irene Ainsley; Haidress Cregan, Mr. Robert

Week - All Stations - to Mar. 18

Peter; Miles na Coppaleen, Mr. Wilson; Father Tom, Mr. Walter Brough.
Haidress Cregan, of the Irish gentry, has been secretly married to a peasant girl, Eily O'Connor, called the Colleen Bawn, and finds himself in an embarrassing position when his mother, to retrieve their fortune, arranges for his marriage with a wealthy heiress. Eily lives with her old foster-mother, Sheila, and Haidress visits her by night. Their signal is "The Moon Hath Raised Her Lamp Above." Sheila's son, Miles, has always wanted to marry Eily, and he has made himself her champion. When Haidress comes with the intention of taking the marriage license from Eily, Miles, along with Father Tom, the old Parish Priest, protects her, and makes her keep the license.
"The Moon Hath Raised"—Father Tom and Haidress Cregan.
"There is a Charming Girl"—Haidress Cregan.
"In My Lone Mountain Valley"—Eily.
"Let the Farmer Praise"—Quartet.
"Believe Me If All Those"—Sheila.
"Certificate Duet"—Haidress and Eily.
"Eily Mavourneen"—Haidress Cregan.
"Thus Kneeling Before Thee"—Quartet.
10.0: A thought.
10.2: God Save the King.

2YA WELLINGTON (420 METRES)—TUESDAY, MARCH 13.

3 p.m.: Chimes of the G.P.O. clock.
3.1: Selected gramophone items.
3.30: Lecturette on "Electric Cooking," by a representative of S. Brown, Ltd.
3.45: Selected gramophone items.
5.0: Close down.
6.0: Children's hour—Uncle Jasper, assisted by party under the direction of Mrs. Thomas, birthday greetings, songs, storiees.
7.0: News session, market reports, and sports result.
7.40: Lecturette—"For the Man on the Land," by a representative of the Agricultural Department.
8.0: Chimes of the G.P.O. clock.
8.1: Overture—Kamennoi-Ostrow" (Rubinstein).
8.5: Vocal quartet—Orpheus Quartet, "Beauty Eyes" (Tosti).
8.10: Saxophone solo—Mr. A. H. Wright, "Saxophobia" (Wiedoeft).
8.15: Recital—Mr. R. Walpole, "You Know What I Mean" (Hayes).
8.20: Instrumental trio—Symons-Ellwood-Short Trio, "First Movement, Trio in B Major" (Brahms).
8.30: Soprano solo—Mrs. Alice Harris, "O, Who Shall Say?" (German).
8.35: 'Cello solo—Mr. Geo. Ellwood, "Hamabdil" (Bantock).
8.42: Vocal duet—Miss Lily Mackie and Mr. Len Barnes, "The Glory of the Sea" (Sanderson).
8.47: Italian mandolin solos—Mr. Lad Haywood, (a) "Dream Boat" (Novello); (b) "The Girl Friend" (Conrad and Donaldson).
8.54: Tenor solo—Mr. Arthur Coe, "You" (Parker).
8.59: Weather forecast.
9.0: Soprano solo—Mrs. Alice Harris, "Softly Awakes My Heart" (Saint-Saens).
9.5: Saxophone solo—Mr. A. H. Wright, "Saxema" (Wiedoeft).
9.10: Vocal quartet—Orpheus Quartet, "Bells of St. Michael's Tower" (Knyvett).
9.16: Instrumental trio—Symons-Ellwood-Short Trio, (a) "Ave Maria" (Kahn); (b) "Melody" (Denza).
9.26: Baritone solo—Mr. Len. Barnes, "Edward" (Loewe).
9.31: Sketch—Pat and Walter, "A Curtain Lecture" (Henry).
9.39: 'Cello solo—Mr. Geo. Ellwood, "Largo from Concerto" (Tartini).
9.44: Contralto solo—Miss Lily Mackie, "I Love the Moon" (Rubens).
9.48: English mandola solos—Mr. Lad Haywood, (a) "The Volga Boat Song" (Koeneman); (b) "Yesterday" (Wilhite).
9.55: Tenor solo, with quartet—Mr. Arthur Coe and Orpheus Quartet, "Never Say Die" (Vaughan).
God Save the King.

3YA CHRISTCHURCH (306 METRES)—TUESDAY, MARCH 13.

SILENT DAY.

4YA DUNEDIN (463 METRES)—TUESDAY, MARCH 13.

3 p.m.: Town Hall chimes.
3.1: His Master's Voice recital.
3.30: Social notes and news.
3.40: Studio music.
4.0: Address on "Cooking by Electricity," by Mr. Butcher, of Messrs. Turnbull and Jones.
4.15: His Master's Voice gramophone recital.
4.30: Close down.
6.0: Children's hour—Big Brother Bill, assisted by Fife and Drum Band, of the Moray Place School, birthday greetings, letters, musical items, and stories.
7.15: News session.
7.30: Address on "Tourist Resorts," by Mr. R. W. Marshall, of the Government Tourist Department.
8.0: Town Hall chimes. Concert by St. Kilda Band, under the conductorship of Mr. James Dixon, and assisting artists.
8.1: March—Band, "Voice of the Guns" (Rimmer).
8.6: Selection—Band, "Melodious Gems" (Rimmer).
8.18: Tenor solos—Mr. C. C. Scott, (a) "Last Rose of Summer" (arr. Moore); (b) "The Minstrel Boy" (arr. Moore).
8.25: Recital—Miss Anita Winkel, "My Financial Career" (Leacock).
8.29: Bass solo—Band, "Cyclops" (Rimmer).
8.35: Humorous solos—Mr. Chas. Rowand, (a) "I Used to Sigh for the Silvery Moon" (Darewski); (b) "Blue Bird" (Nichol).
8.45: Recital—Mr. J. B. McConnell, "A Dicken's Monologue" (Phillips).
8.50: Waltz—Band, "Reflections" (Bordogni).
9.0: Town Hall chimes. Weather forecast.
9.4: Baritone solo—Mr. Reg. Richards, "Kashmiri Song" (Woodford-Finden).
9.7: Selection of hymns—Band.
9.13: Tenor solo—Mr. C. C. Scott, "Molly Bawn" (traditional).
9.18: Child impersonation and recital—Miss Anita Winkel, (a) "The Yaller Dog" (Anon.); (b) "In the Usual Way" (Anon.).
9.25: Selections—Band, (a) "Minuet in G" (Beethoven); (b) "Song of the Wanderer" (Moret).
9.33: Humorous solo—Mr. Chas. Rowand, "Begin As You Mean to Go On" (Lawrence).
9.39: Selection—Band, "Prelude" (Rachmaninoff).
9.45: Baritone solos—Mr. Reg. Richards, (a) "Sleep and the Roses" (Bowles); (b) "Blue Skies" (Berlin).
9.52: Recitals—Mr. J. B. McConnell, (a) "The Thousandth Man" (Kipling); (b) "In Trouble Again" (Foy).
9.57: March—Band, "Boulder City" (Hume).
10.0: God Save the King.

Wednesday, March 14th

1YA AUCKLAND (333 METRES)—WEDNESDAY, MARCH 14.

3 p.m.: Afternoon session—Selected studio items.
4.0: Literary selection by the Announcer.
4.30: Close down.
6.0: Children's hour, conducted by Uncle Tom, birthday greetings, songs, verses, and stories.
7.15: News and reports.
7.45: Talk on "Physical Culture," by Mr. Norman Kerr.
8.0: Chimes.
8.1: Relay of municipal concert from Town Hall, assisted by the Hazell-Sutherland Duo, who will broadcast the following items from the studio:—
Contralto solos—Miss Phyllis Hazell, (a) "A Summer Night" (Thomas); (b) "The Fishermen of England" (Phillips).
Baritone solos—Mr. Frank Sutherland; (a) "Lorraine" (Sanderson); (b) "Youth" (Allitsen).
Vocal duets—Hazell-Sutherland Duo, (a) "Macheta"; (b) "Miserere" from "Il Trovatore" (Verdi).
10.0: A thought.
10.2: Close down.

2YA WELLINGTON (420 METRES)—WEDNESDAY, MARCH 14.

SILENT DAY.

3YA CHRISTCHURCH (306 METRES)—WEDNESDAY, MARCH 14.

3 p.m.: Afternoon concert session—Selected studio items.
4.30: Close down.
6.0: Children's hour—Uncle Peter and Mother Hubbard, greetings, stories, songs, and quartets.
7.15: Addington stock market reports.
7.30: News session.
8.0: Chimes. Relay of orchestral selections from the Grand Picture Theatre Orchestra, under the conductorship of Mrs. K. Black.
The Aeolian Quartet will present the musical play, "Going Up," by Harbach and Hirsch.
8.15: Opening number from "Going Up"—Mrs. Claris Shaw and Aeolian Quartet.
Bass solo—Mr. W. J. Richards, "I'll Bet You" (Harbach and Hirsch).
Contralto and bass duet—Miss Mildred Russell and Mr. W. J. Richards, "I Want a Boy" (Harbach and Hirsch).
Soprano and contralto duet—Mrs. Claris Shaw and Miss M. Russell, "If You Look in Her Eyes" (Harbach and Hirsch).
Tenor solo—Mr. Gregory Russell, "Going Up" (Harbach and Hirsch).
Humorous recital—Miss Winifred Smith, L.T.C.L., "Yes, Papa" (M.S.).
Instrumental trio—Christchurch Broadcasting Trio, two impressions from "Rubaiyat" (Gustav Robert).
Contralto solo and chorus—Miss Mildred Russell and Aeolian Quartet, "Touch of a Woman's Hand" (Harbach and Hirsch).
Tenor and bass duet—Messrs. Russell and Richards, "Down Up, Left, Right" (Harbach and Hirsch).
Soprano and bass duet—Mrs. Claris Shaw and Mr. W. J. Richards, "Do It For Me" (Harbach and Hirsch).
Soprano solo and chorus—Mrs. Claris Shaw and Aeolian Quartet, "Tickle Toe" (Harbach and Hirsch).
Soprano and tenor duet—Mrs. Claris Shaw and Mr. Gregory Russell, "Kiss Me" (Harbach and Hirsch).
Scene and chorus—Mrs. Claris Shaw, Mr. Gregory Russell and chorus, from "Going Up" (Harbach and Hirsch).
Weather report.
'Cello solo—Mr. Harold Beck, "Serenade" (Squire).
Recital of Australian verse—Miss Winifred Smith, L.T.C.L., "Bannerman of the Dandenong" from "Australian Bush Ballads" (M.S.).
Vocal quartet—Aeolian Quartet, "Hip, Hooray" (Harbach and Hirsch).
Bass solo and chorus—Mr. W. J. Richards and Aeolian Quartet, "A Brand New Hero" (Harbach and Hirsch).
Finale—Aeolian Quartet—Final chorus from "Going Up" (Harbach and Hirsch).
Instrumental trios—Christchurch Broadcasting Trio, (a) "Russian Folk Trio" (traditional); (b) "Hungarian Dance" (Delibes).
Fox-trot song—Aeolian Quartet, "Shepherd of the Hills" (Nicholls).
'Cello solo—Mr. Harold Beck, "Village Dance" (Popper).
Fox-trot song—Aeolian Quartet, "Just a Memory" (Henderson).
Relay of orchestral music from Grand Picture Theatre Orchestra.
God Save the King.

4YA DUNEDIN (463 METRES)—WEDNESDAY, MARCH 14.

SILENT DAY.

Thursday, March 15th

1YA AUCKLAND (333 METRES)—THURSDAY, MARCH 15.

3 p.m.: Afternoon session—Selected studio items.
4.0: Literary selection by the Announcer.
4.30: Close down.
6.0: Children's hour, conducted by Peter Pan, birthday greetings, songs, and stories.
7.15: News and reports.
8.0: Chimes.
8.1: Relay of orchestral overture from Rialto Theatre, under the conductorship of Mr. Henry C. Engel.
8.16: Contralto solo—Miss Mina Caldow, "The Little Damozel" (Novello).
8.20: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Trio in F Major, Op. 42, First and Second Movement" (Gade).
8.30: Baritone solo—Mr. Barry Coney, "Nocturne" (Head).
8.34: Flute solo—Mr. Victor Bedford, "Sans Parola" (Clinto).
8.39: Soprano solos—Miss Lola Solomon, (a) "The Starling" (Lehmann); (b) "The Yellow-Hammer" (Lehmann).
8.46: Pianoforte solo—Mr. Cyril Towsey, "Il Lamento" (Moskowski).
8.51: Talk on "Great Authors," by Mr. Clifford Bell.
9.6: Weather forecast.
9.8: Relay of orchestral interlude from Rialto Theatre.
9.20: Contralto solos—Miss Mina Caldow, (a) "In Summer Fields" (Brahms); (b) "The Poet's Life" (Elgar).
9.27: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Peer Gynt Suite" (Greig).
9.34: Baritone solo—Mr. Barry Coney, "Had a Horse" (Korbay).
9.38: Flute solos—Mr. V. Bedford, (a) "Berceuse" (Kohler); (b) selected.
9.45: Soprano solo—Miss L. Solomon, "L'Ete" (Chaminade).
9.49: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Trio in F Major, Op. 42, Third and Fourth Movements" (Gade).
9.58: Baritone solo—Mr. Barry Coney, "It's Very Vexin'" (Sterndale-Bennet).
10.2: A thought.
10.4: God Save the King.

2YA WELLINGTON (420 METRES)—THURSDAY, MARCH 15.

12 noon: Relay of Wellington Racing Club's autumn meeting from Trentham (subject to the permission of the Wellington Racing Club).
6 p.m.: Children's hour—Uncle Sandy, assisted by the Wellington Girl Guides in a "Round the Camp Fire Evening," choruses, novelty items, and birthday rhymes.
7.0: News session, market reports, and sports results.
7.40: Lecturette—"New Zealand's Tourist, Holiday, and Sporting Attractions," by Mr. Black, of Tourist Department.
8.0: Chimes of the G.P.O. clock.
8.1: March—Salvation Army Silver Band, "Herald of Praise" (arr. Dickens).
8.6: Humorous sketch—The Mellow Fellows, "The Side-show" (O'Hara).
8.11: Selection—Salvation Army Silver Band, "Gems from the Great Masters" (arr McAnally).
8.25: Baritone solo—The Baritone Fellow, "The Road to Loch Lomond" (Evans).
8.30: Cornet solo, with band accompaniment—Bandsman N. Goffin, "Happy Day" (Leidzen).
8.35: Song and harmony—The Tenor Fellow and All the Rest, "Old Kentucky Home" (traditional).

Radio valves do not contain a perfect vacuum. The ordinary detector is estimated to hold about thirteen trillion molecules of air. An absolutely perfect vacuum has never been produced. In the highest vacuum thus far attained, less than one ten-billionth of the air originally in the glass bulb remained after the exhaust pump had done its best work.

A simple chemical polarity indicator consisting of a piece of litmus paper moistened in a solution of salt and water is a simple means of determining the positive or negative leads of a battery. By touching the two leads to the litmus paper, one lead will turn from red to dark lavender This will be the negative lead. Litmus is a purple dye, sensitive to acids.

The liner Jervis Bay, of the Australian Commonwealth Line of steamers, which was fitted with a short-wave installation about two years ago, has been in constant communication with the local coastal stations throughout each voyage to London and return, and a direct commercial service is being maintained for the benefit of passengers and their friends on shore. Last October advice having been received that a commercial short-wave station had been opened for ship communication at Burnham, England, communication was established and a service has since been maintained by the vessel direct with England throughout the voyage, Sydney to London and return.

In drilling bakelite, even at ordinary speeds, it is a much better policy to use "high speed" drills, as these will not be damaged by the overheating which is usually experienced. They cost a little more, but their increased life will more than make up for their first cost.

Programmes Continued

8.40: Selection—The Salvation Army Silver Band, "English Melodies."
8.47: Vocal solo—The Bass Fellow, "Limericks" (Manning).
8.52: Humorous recital—Miss Violet Wilson, "Singers and Talkers" (Kent).
8.57: Cornet duet, with piano accompaniment—Conductor Dutton and Bandmaster Jackson, "Anchored."
9.2: Weather forecast.
9.3: A distinct improvement—Two Fellows, "Good Luck and Bad" (Squire).
9.8: Hymns—Salvation Army Silver Band, (a) "The Great Physician";; (b) "Lux Benigna."
9.15: Domestic infelicity—The Henpecked Fellow, "Corp'ral John Bartholemy" (Squire).
9.18: Selection—Salvation Army Silver Band, "Rousseau" (arr. Goldsmith).
9.26: Honest toil—The Poor Fellow, "Stone-cracker John" (Coates).
9.31: Selection—Salvation Army Silver Band, "Over Jordan" (arr. Coles).
8.41: Humorous recital—Miss Violet Wilson, "Mrs. B's Alarms" (Anon.).
9.45: March—Salvation Army Silver Band, "New Zealand" (arr. Scotney).
9.52: Vocal quartet—The Mellow Fellows, "Blue Sky."
9.56: March—Salvation Army Silver Band, "Johannesburg" (arr. Arnot)t.

3YA CHRISTCHURCH (306 METRES)—THURSDAY, MARCH 15.

3 p.m.: Afternoon concert session—Selected studio items.
4.30: Close down.
6.0: Children's hour—Chuckle and Aunt Pat, birthday greetings, stories, and songs.
7.15: News and reports.
8.0: Chimes. Relay of orchestral selections from the Liberty Theatre, under the conductorship of Mr. Ernest Jamieson.
Irish concert by Madame Gower-Burns's Grand Operatic Quartet.
8.15: Mixed vocal quartet—"The Meeting of the Waters" (traditional, arr. Stewart).
8.19: Baritone solo—Mr. Bernard Rennell, "Cruiskeen Lawn" (traditional).
8.22: Instrumental trio—Christchurch Broadcasting Trio, "Allegro Appassionata from Third Trio" (Lalo).
8.32: Soprano solos—Madame Gower-Burns, (a) "The Last Rose of Summer" (traditional); (b) "Killarney" (Balfe).
8.39: Pianoforte solo—Miss Aileen Warren, "Lulla-Lo" (Irish lullaby) (Baron).
8.43: Tenor solo—Mr. Harold Prescott, "Macushla" (MacMurrough).
8.47: Recital—Mr. H. Instone, "Pat Malone Goes Ploughing."
8.52: Contralto solo—Mrs. Ann Harper, "The Kerry Dance" (Molloy).
8.55: Mixed vocal quartets—Grand Operatic Quartet, (a) "When Through Life Unblest" (arr. Stewart); (b) "The Harp that Once Through Tara's Halls" (arr. Stewart).
9.0: Relay of orchestral music from the Liberty Picture Theatre.
9.15: Baritone solo—Mr. Bernard Rennell, "Christening" (Fischer).
9.18: Soprano solos—Madame Gower-Burns, "A Little Bit of Heaven" (traditional); (b) "Come Back to Erin" (Claribel).
9.25: Instrumental trios—Christchurch Broadcasting Trio, (a) "Londonderry Air" (Irish air, arr. Grainger); (b) "Oft in the Stillly Night" (Irish air).
9.35: Mixed vocal quartets—Grand Operatic Quartet, (a) "Let Erin Remember" (arr. Stewart); (b) "Silent, Oh Moyle" (arr. Stewart).
9.41: Pianoforte solo—Miss Aileen Warren, "Irish Selection."
9.45: Tenor solos—Mr. Harold Prescott, (a) "Oft in the Stilly Night" (traditional); (b) "The Snowy-breasted Pearl" (Robinson).
9.49: Recital—Mr. H. Instone, "Taking the Census" (an Irish incident) (M.S.).
9.54: Contralto solos—Mrs. Ann Harper, (a) "Husheen" (Needham); (b) "The Four-leaf Clover" (Brownell).
9.58: Vocal mixed quartets—Grand Operatic Quartet, (a) "I Saw Thy Form" (arr. Stewart); (b) "Sing, Sweet Harp" (arr. Stewart).
God Save the King.

4YA DUNEDIN (463 METRES)—THURSDAY, MARCH 15.

7 p.m.: Town Hall chimes.
7.1: Request gramophone concert.
7.30: News session.
8.0: Town Hall chimes.
8.1: Relay of light orchsetral selection from Octagon Theatre.
8.11: Baritone solos—Mr. F. M. Tuohy, (a) "Vale" (Russell); (b) "To the Forest" (schaikowsky).
8.18: 'Cello solo—Mr. Malcolm Robilliard, "Valse Triste" (Sibelius).
8.23: Contralto solo—Miss Winnie McPeak, "O Lovely Night" (Ronald) ('cello obbligato).
8.27: Pianoforte solos—Mrs. W. Munro, L.T.C.L., (a) "Valse in E Minor" (Chopin); (b) "Largo Sonata in a Major" (Beethoven).
8.37: Bass solo—Mr. E. G. Bond, "The Bandelero" (Stuart).
8.41: Relay of orchestral music from the Octagon Theatre.
8.51: Soprano solos—Miss Rita Holmes, (a) "One Fine Day" from "Madame Butterfly" (Puccini); (b) "Esla's Dream" from "Lohengrin" (Wagner).
8.59: Weather forecast.
9.0: Town Hall chimes.
9.2: Address by Pastor W. D. More.
9.17: Baritone solo—Mr. F. M. Tuohy, "What Am I, Love, Without Thee?" (Adams).
9.20: 'Cello solos—Mr. Malcolm Robilliard, (a) "Coronach" (Barratt); (b) "Plaint d'Amour" (Pillier).
9.29: Contralto solos—Miss Winnie McPeak, (a) "Love's Old Sweet Song" (Molloy); (b) "Arise, O Sun" (Day) ('cello obbligato).
9.36: Pianoforte solo—Mrs. W. Munro, "Venetian Regatta" (Liszt).
9.40: Bass solos—Mr. E. G. Bond, (a) "Mine Enemy" (Rudd).
9.47: Soprano solo—Miss Rita Holmes, "Love and Music" from "La Tosca" (Puccini).
9.50: Relay of orchestral music from the Octagon Theatre.
10.0: Close down.

Friday, March 16th

1YA AUCKLAND (333 METRES)—FRIDAY, MARCH 16.

3 p.m.: Afternoon session—Selected studio items.
4.0: Literary selection by the Announcer.
4.30: Close down.
6.0: Children's hour, conducted by Nod, birthday greetings, songs, recitations, stories.

Perhaps one of the most effective ways in which religious services via radio touch the heart is through their music. The thousands of letters that pour into the larger American stations show clearly that well-known hymns mean a great deal to large numbers.

Interviewed in New York in January, Marconi was asked: "Do you believe that television will enter the homes on as large a scale as radio concerts at the present time?" He replied: "Yes, television will be seen in homes throughout the land, but I do not know how soon."

A London radio writer, in an article in the New York "Radio News," says: "There is not as yet any decided tendency here to call a radio valve a 'tube,' but that will come in good time. We must not hurdle the imagination of stolid materialists who cannot recognise in a pear-shaped bulb any special likeness to a tubular object. When you say 'tube' to a Britisher he thinks of a sewer pipe or the glass tuge of the chemical laboratory, or the subway, which used to be called the 'twopenny tube' because the fare was twopence, any distance. He calls a valve a valve because somebody called a valve a valve; and he has always called a valve a valve, because it is a valve."

A new technical compilation of formulas and tables for the calculation of aerial capacity has recently been prepared by the United States Bureau of Standards. It includes formulas for calculating the capacity of almost every kind of aerial—the single, horizontal (T) wire, single-wire inverted L, horizontal "cage," etc., etc. There are also calculations of capacity of lead-in wires and tables for aerial calculations. New Zealanders who desire to purchase this publication should wire to the Government Bureau of Standards, Washington, U.S.A., for Bureau of Standards Letter-Circular 224.

Marconi was asked in New York recently: "In your opinion, will the present broadcast band of 550 to 200 metres ever be changed to short waves, thus necessitating the scrapping of present equipment?" He replied: "I can see a field for short waves, but they will play their most important role in international exchange of programmes; that is, for long-distance broadcasting. However, I believe the wave-band now used for broadcasting entertainment is well adapted for that use, and I can see no benefit to be gained for the broadcasting stations to operate on channels below 100 metres unless they desire to be heard in foreign countries.

As there is no license fee for broadcast listeners in the United States, the listener being a "beggar" cannot be a "chooser," and has to accept what is handed out by the broadcast stations. In the February issue of the New York "Radio News" a listener writes:—"I would suggest broadcasting a plan asking every radio listener to contribute a dollar (4s. 2d.) towards establishing a fund to cover the cost to stations and entertainers of one or more super-programmes, of, say, not more than two hours' duration. If the stations did not wish to father the idea it could be sponsored by your publication or by a committee of listeners. A big hook-up could be arranged that would nullify any charge of favouritism between stations and, if I am anywhere near correct in my prognostications, the furtherance of this plan would lead to a permanent high-class form of reception which millions of listeners would be glad to pay for." A system of voluntary contributions was tried in New Zealand before the Broadcasting Company was formed. Result—failure.

An American radio writer says of radio-vision—"If the public would care for a rather poor picture we could give it to them to-day, but I think it advisable to move forward nearer perfection before we begin to broadcast pictures. We might be able now to send out pictures comparable in quality to the music radiated in 1920—therefore, you see, we are not yet ready to broadcast perfect pictures. The television problem to-day is to simplify our apparatus. It must be made practical and economical so that it can be used in the home at no more cost than broadcast receivers are to-day. I should say we still have a long way to go." So there!

The electrons, tiny specks of negative electricity, so small that even the most powerful microscope cannot detect them, give the radio valve its ability to promote progress in radio. One scientist estimates that if a drop of water, which includes a vast number of electrons, because of the hydrogen and oxygen within it, was magnified to the size of the earth, each electron magnified in proportion would be about as large as a grain of sand.

Listeners who are troubled by loud howls from their sets when the last stage of audio frequency is brought into operation, although the set functions well when only one stage is used, may be interested to learn that it has been found in a number of cases that seldom does the fault lie in the receiver itself. Usually it is caused by run down "B" batteries. Substitution of new batteries is the only means of determining if this is so in any particular instance. The greater the number of valves employed in the set, the more likely it is to be so.

7.15: Talk on "Motoring," by Mr. Geo. Campbell.
7.30: News and reports.
8.0: Chimes.
8.1: Relay of orchestral overture from Strand Theatre Orchestra, under the conductorship of Eve Bentley.
8.16: Contralto solo—Miss Beryl Smith, "Caro Mio Ben."
8.21: Cornet solo—Mr. Fred. Bowes, "Silver Threads Among the Gold" (Rimmer).
8.26: Baritone solo—Mr. Clinton Williams, "Less Than the Dust" (Finden).
8.30: Instrumental and vocal—Ingall's Hawaiian Instrumentalists, (a) "Honolulu March"; (b) "Honolulu Moon."
8.39: Soprano solo—Miss Alma McGruer, "Fiddler, Come and Play For Me" (Phillips).
8.43: Recital—Mr. Thomas Harris, "By the Yukon Trail."
8.48: Vocal duets—Miss B. Smith and Miss A. McGruer, (a) "Echoing Dreams"; (b) "The Rosary."
8.56: Weather forecast.
8.58: Relay of orchestral interlude from Strand Picture Theatre Orchestra.
9.13: Baritone solos—Mr. Clinton Williams, (a) "O, Mistress Mine" (Quilter); (b) "Stone-cracker John" (Coates).
9.21: Instrumental and vocal—Ingall's Hawaiian Instrumentalists, "Maori Melodies."
9.27: Contralto solo—Miss B. Smith, "Barbara Allen" (Old English).
9.32: Cornet solos—Mr. F. Bowes, (a) "The Farewell" (Hartmann); (b) "Sweet Spirit. Hear My Prayer" (Wallace).
9.40: Recitals—Mr. T. Harris, (a) "Not Old"; (b) "Pink Dominoes" (Kipling).
9.48: Soprano solo—Miss A. McGruer, "Thoughts" (Fisher).
9.51: Instrumental and vocal—Ingall's Hawaiian Instrumentalists, (a) "Lament of the Southern Sea"; (b) "I'll Be Happy."
9.58: Vocal duet—Misses Smith and McGruer, "A Dream of Delight" (Nicholls).
10.2: A thought.
10.4: God Save the King.

2YA WELLINGTON (420 METRES)—FRIDAY, MARCH 16.

3 p.m.: Chimes of the G.P.O. clock.
3.1: Selected gramophone items.
3.30: Lecturette on "Gas Cooking," by Miss Marian Christian, of the Wellington Gas Company.
3.45: Selected gramophone items.
5.0: Close down.
6.0: Children's hour—Uncle Ernest, assisted by the Y.M.C.A. Boy Scouts, jokes, sketches, birthday greetings.
7.0: Chimes of the G.P.O. clock.
7.1: News session, market reports, and sports results.
7.30: Lecturette—Mr. Jackson, "A Royal Hobby."
7 45: Lecturette—Mr. D. G. Paris, of Wellington Centre, A.A.A., "Athletics."
8.0: Chimes of the G.P.O. clock.
8.1: Overture—March, selected.
8.5: Vocal quartet—Wm. Renshaw Quartet, "Thus Spake, One Summer's Day" (Abt).
8.10: Hawaiian duos—Messrs. Berthold and Bent, (a) "Me and My Shadow" (Jolson); (b) "What Does It Matter?" (Berlin).
8.17: Tenor solos—Mr. Wm. Renshaw, (a) "To Daisies" (Quilter); (b) "Erisky Love Lilt" (Kennedy Fraser).
8.22: Instrumental trio—Symons-Ellwood-Short Trio, "First Movement Trio in E Flat" (Hummel).
8.32: Contralto solo—Miss Nora Greene, "My Dear Soul" (Sanderson).
8.37: Pianoforte solo—Miss Glen Carty, "Sonata, Op. 110" (Beethoven).
8.43: Baritone solo—Mr. Thomas C. Wood, "Life's Epitome" (Kenneth Roe).
8 48: Humour—The Two Boiled Owls, "The Two Jacks."
8.57: Soprano solo—Mrs. Amy Dunn, "A Brown Bird Singing" (Wood).
9.2: Weather forecast.
9.3: Lecturette—Editor-Announcer, "Imperial Affairs."
9.18: Duet (vocal)—Mrs. Amy Dunn and Mr. Wm. Renshaw, "Love's Melody" (Barrington).
9.22: Instrumental trios—Symons-Ellwood-Short Trio, (a) "Elegie" (Massenet); (b) "Serenade" (Widor).
9.32: Contralto solo—Miss Nora Greene, "The Lost Chord" (Sullivan).
9.36: Pianoforte solo—Miss Glen Carty, "Caprice" (Chabrier).
9.41: Baritone solo—Mr. Thomas C. Wood, "The Arrow and the Song" (Balfe).
9.45: Hawaiian duos—Messrs. Berthold and Bent, (a) "Southern Blues" (Palekiko); (b) "In a Little Spanish Town" (Wayne).
9.51: Humour—The Two Boiled Owls, "My Idea of Heaven."
9.56: Vocal quartet—Wm. Renshaw Quartet, "Serenade" (Smart).
God Save the King.

3YA CHRISTCHURCH (306 METRES)—FRIDAY, MARCH 16.

3 p.m.: Afternoon concert session—Selected studio items.
4.30: Close down.
6.0: Children's hour—Big Brother, assisted by the Girl Guides, birthday greetings, stories, songs.
7.15: News and reports.
7.30: Talk on "Care of the Mouth and Teeth," by a member of the North Canterbury Dental Association.
8.0: Chimes. Relay of orchestral music from the Crystal Palace Theatre Orchestra, under the conductorship of Mr. A. J. Bunz.
The Melodious Four present the musical play, "A Country Girl" (by Lionel Monckton and Paul Rubens).
8.15: Bass solo and mixed quartet—Mr. T. D. Williams and the Melodious Four, "When the Birds Begin to Sing" (Monckton, Rubens).
8.19: Contralto solo—Miss Belle Renaut, "Try Again, Johnnie" (Monckton, Rubens).
8.22: Violin solo—Miss Irene Morris, "Cantilene" (Bohm).
8.25: Soprano solo—Miss Frances Hamerton, L.A.B., "Coo" (Monckton, Rubens).
8.28: Tenor solo—Mr. Russell Sumner, "Yo, Ho, Little Girls" (Monckton, Rubens).
8.31: Humorous recital—Mr. J. P. Darragh, "Guy de Vere's Mix-up" (own arrangement).
8.36: Bass solo—Mr. T. D. Williams, "The Sailor's Life" (Monckton, Rubens).
8.39: Soprano and tenor duet—Miss Frances Hamerton and Mr. Russell Sumner, "Boy and Girl" (Monckton and Rubens).
8.42: Instrumental trios—Christchurch Broadcasting Trio, (a) "Country Dance" (Gade); (b) "Countess of Westmoreland's Delight" (Shield); (c) "Mazurka" (Malling).
8.52: Mixed quartet—Melodious Four, "The Rajah of Bhong" (Monckton, Rubens).
8.57: Contralto and bass duet—Miss Belle Renaut and Mr. T. D. Williams, "Two Chicks" (Monckton, Rubens).
9.0: Weather forecast.
9.1: Relay of orchestral music from Crystal Palace Picture Theatre Orchestra.
9.15: Mixed vocal quartet—Melodious Four, "The Arcadians" (Monckton, Rubens).
9.19: Contralto solo—Miss Belle Renaut, "Under the Deodar" (Monckton, Rubens).
9 22: Soprano solo and chorus—Miss Frances Hamerton and Melodious Four, "Ah! Now I See" (Monckton, Rubens).
9.25: Violin solo—Miss Irene Morris, "Hornpipe" (Mistowski).
9.29: Mixed vocal quartet—Melodious Four, "The Season" (Monckton, Rubens).
9.33: Bass solo and chorus—Mr. T. D. Williams and Melodious Four, "It Will All Come Right" (Monckton, Rubens).
9.36: Contralto and tenor duet—Miss Belle Renaut and Mr. Russell Sumner, "Quarrelling" (Monckton, Rubens).
9.39: Humorous recital—Mr. J. P. Darragh, "Fair Dinkum" (a Coster's recitation) (Nelson).
9.42: Soprano solo and chorus—Miss Frances Hamerton and Melodious Four, (a) "She's Acting"; (Monckton, Rubens); (b) "Now My Story's Ended" (Monckton, Rubens).
9.43: Tenor solo—Mr. Russell Sumner, "My Own Little Girl" (Monckton, Rubens).
9.45: Instrumental trios—Christchurch Broadcasting Trio, (a) "Preamble" (Wood); (b) "Norfolk Folk Tune" (Wood); (c) "Country Dance" (Foulds).
9.55: Soprano solo and chorus—Miss Frances Hamerton and Melodious Four, "I Can Laugh, I can Love" (Monckton, Rubens).
9.59: Bass solo and chorus—Mr. T. D. Williams and Melodious Four, "Peace, Peace" (Monckton, Rubens).
10.3: Contralto solo—Miss Belle Renaut, "Pixies" (Monckton, Rubens).
10.6: Tenor solo and chorus—Mr. Russell Sumner and Melodious Four, "The Sailor Man" (Monckton, Rubens).
God Save the King.

Programmes Continued

4YA DUNEDIN (463 METRES)—FRIDAY, MARCH 16.

3 p.m.: Town Hall chimes.
3.1: His Master's Voice gramophone recital.
3.15: Talk on "Fashions," by Mr. Fullerton, of the D.I.C.
3.30: Afternoon tea music from the Savoy.
3.45: Studio music.
4.0: Relay of music from the Savoy.
4.15: His Master's Voice gramophone recital.
4.30: Close down.
6.0: Children's hour—Big Brother Bill, birthday greetings, letters, songs, and stories.
7.15: News session.
7.30: Address on "Books," by Mr. H. Greenwood, librarian of the Dunedin Athenaeum.
8.0: Town Hall chimes.
8.1: Soprano solos—Miss Roma Buss, (a) "Love's Rhapsody" (d'Hardelot); (b) "I Wonder If Love Is a Dream" (Forster).
8.8: Pianoforte solo—Miss Aroha Allan, "Sonata, First Movement" (Schubert).
8.13: Tenor solo—Mr. L. E. Dalley, "Songs My Mother Taught Me" (Dvorak).
8.17: Recitations—Miss Sheila Neilson, "The War-time Trawler" (Anon.).
8.22: Mezzo-soprano solos—Miss Mollie Andrews, selections from "No, No, Nannette" (Youmans).
8.30: Bass solo—Mr. John Macpherson, "Limehouse" (Hayden).
8.34: Pianoforte solos—Miss Aroha Allan, "Sonata, Second and Third Movements" (Schubert).
8.45: Soprano solo—Miss Roma Buss, "Sweetheart" from "Maytime."
8.50: Tenor solos—Mr. L. E. Dalley, (a) "Take a Pair of Sparkling Eyes" (Sullivan); (b) "Maire, My Girl" (Aitken).
8.58: Recitations—Miss Sheila Neilson, (a) "Coastwise Light"; (b) "The Road to Mandalay" (Kipling).
9.6: Mezzo-soprano solo—Miss Mollie Andrews, "Invitation to the Dance" (Woodford-Finden).
9.10: Bass solos—Mr. John Macpherson, (a) "Young Tom o' Devon" (Russell); (b) "Sincerity" (Clarke).
9.16: Relay of dance music from the Savoy.
10.0: Close down.

Saturday, March 17th

1YA AUCKLAND (333 METRES)—SATURDAY, MARCH 17.

3 p.m.: Afternoon session—Selected studio items.
4.0: Literary selection, by the Announcer.
4.30: Close down.
6.0: Children's hour—Cinderella, birthday greetings, songs, recitations, and stories.
7.15: News, reports, and sports results.
8.0: Chimes. Special Irish concert programme.
8.1: Relay of orchestral overture from the Rialto Picture Theatre Orchestra, under the conductorship of Mr. Henry C. Engel.
8.15: Vocal quartet—Madame Mary Towsey Quartet, "Last Rose of Summer" (Wallace).
8.19: Instrumental trio—Bosworth-Hemus-Towsey, "Trio in D Major, Op. 49, Scherzo" (Mendelssohn).
8.28: Tenor solo—Mr. Peter Rose, "She Is Far from the Land" (Lambert).
8.32: Recital—Mr. J. F. Montague, "Shandon Bells" (Prout).
8.38: Soprano solo—Madame Mary Towsey, "Kathleen Mavourneen" (Crouch).
8.43: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Londonderry Air" (arr. O'Connor).
8.49: Baritone solo—Mr. John Bree, "For the Green" (Lohr).
8.53: Talk on "Old Ireland," by Mr J. J. Sullivan.
9.8: Weather forecast.
9.10: Tenor solo and quartet—Mr. Rose, "Eileen Alannah" (Thomas).
9.15: Relay of orchestral interlude from the Rialto Theatre.
9.30: Soprano solo—Madame Mary Towsey, "The Irish Emigrant."
9.35: 'Cello solo—Miss Lalla Hemus, selected.
9.40: Baritone solo—Mr. J. Bree, "The Mountains of Mourne."
9.44: Humorous recital—Mr. J. F. Montague, "Father Phil's Subscription List" (Lover).
9.50: Contralto solo—Miss Gwenyth Evans, "Molly Bawn" (traditional).
9.54: Instrumental trio—Bosworth-Hemus-Towsey Trio, "Trio in D Minor, Op. 49, Finale" (Mendelssohn).
10.3: Vocal quartet—Madame Mary Towsey Quartet, "The Meeting of the Waters."
10.7: Relay of dance music from the Dixieland Cabaret by The Internationals, under the conductorship of Mr. Clyde Howley.
11.0: A thought.
11.1: God Save the King.

2YA WELLINGTON (420 METRES)—SATURDAY, MARCH 17.

12 noon: Relay of Wellington Racing Club's autumn meeting from Trentham (subject to the permission of the Wellington Racing Club).
6 p.m.: Children's hour—Aunts Gwen and Dot, St. Patrick's Day, selections by members of the Buckle Street Convent, choruses, greetings, and songs.
7.0: News session, market reports, and sports results.
St. Patrick's Night Concert, Wellington Town Hall.
7.45: Relay—Mr. J. F. Skedden, organist of St. Joseph's Church, Buckle Street, will play a selection of national airs on the grand organ from 7.45 p.m. till 8 p.m.
8.0: Chimes of the G.P.O. clock.
8.1: Chorus, "Sweet Vale of Avoca"—Marist Brothers' School Choir, Thorndon.
Song, "Danny Boy"—Miss Whelan.
Song, "Marie, My Girl"—Mr. William Renshaw.
Song, "Come Back to Erin"—Miss Kate O'Dwyer, A.T.C.L.
Trio, selected—Pupils of St. Mary's Convent.
Song, "The Fairy Tales of Ireland"—Miss Kathleen Jansen.
Song, "For the Green"—Mr. Thomas C. Wood.
Song, "She Is Far from the Land"—Miss Frances Morrison.
Dance, Irish Jig, by Olive Anderson, Adeline Burnette, Margaret Oates, Margaret Madden, Nola Stewart, Susie Bremner, Sheila Whitehouse, and Jackie Harris (pupils of Miss Phyllis McMillan).
Organ solo, selected Irish airs—Mr. J. F. Skedden.
Song, selected—Convent pupil.
Chorus, selected—Marist Brothers's Boys' Choir, Tasman Street.
Song, "Kathleen Mavourneen"—Miss Kathleen Jansen.
Violin solos, (a) "Londonderry Air"; (b) "Mazurka"—Mr. Leon de Mauny.
Song, "Exile"—Miss Frances Morrison.
Song, selected—Mr. Dan. Foley.
Song, "Hills of Donegal"—Miss Norah Greene.
Song, "Killarney"—Miss Kate O'Dwyer, A.T.C.L.
Chorus, "God Save Ireland"—Pupils of Combined Marist Brothers's Choirs, with grand organ accompaniment.
After the relay, dance items from the studio will be given.
11.0: Close down.
God Save the King.

3YA CHRISTCHURCH (306 METRES)—SATURDAY, MARCH 17.

6 p.m.: Children's hour—Uncle Sam and Aunt May, assisted by cousins from Ferry Road Convent, songs, birthday greetings, and stories.
7.15: News and reports.
7.30: Sports results.
8.0: Chimes. Relay of orchestral selections from Everybody's Picture Theatre Orchestra, under the conductorship of Mr. Albert Bidgood.
8.15: Special Irish concert programme.
Baritone solo—Mr. E. A. Dowell, "Dear Little Irish Mother" (O'Farrell).
8.18: Pianoforte selections—Mr. Ivan Perrin, "Improvisations of Popular Irish Melodies" (M.S.).
8.23: Contralto solo—Mrs. D. W. Stallard, "Danny Boy" (Weatherley).
8.26: Instrumental trios—Christchurch Broadcasting Trio, (a) "Valse Triste" (Sibelius); (b) "Scherzo" (Eade).
8.36: Tenor solo—Mr. David McGill, "The Minstrel Boy" (arr. Rimbault).
8.40: Song at piano—Mr. E. A. Sargeant, "The Little Irish Girl" (Lohr).
8.45: Soprano solo—Miss Mabel Thomas, "Kathleen Mavourneen" (Crouch).
8.49: Speech—Mr. James Laurenson, "Oration on Irish Valour and Loyalty" (Richard Shield).
8.53: Zither banjo solos—Mr. Jack Oxley, (a) "Come Back to Erin" (Claribel); (b) "The Gay Gossoon" (Ossman).

Mr. Max Howden, the prominent Melbourne amateur transmitter, writing in the Melbourne "Listener-in," says:—"A Japanese station is now working regularly on an approximate wavelength of 39 metres, but I have not yet heard its call sign and whereabouts announced. Listening one evening a man and a woman kept up a continuous monotone (which I took to be their national music) for over half an hour. They were going when I switched on, and still going 30 minutes later, when I switched off. It is rather a novelty to listen to these foreign programmes, but it soon wears off in favour of the local programmes."

Captain Richard H. Ranger, inventor of the Ranger system of photo-radio transmission, in a demonstration and talk before a session of the third annual convention of the Institute of Radio Engineers recently in New York, showed how jets of hot and cold air, playing on a sensitised screen, combine to effect one of the latest and most effective methods of recording photographs transmitted from a distance over radio waves. Captain Ranger, who is an engineer of the Radio Corporation of America, transmitted and received photographs and facsimiles the length of the stage in the auditorium, utilising the "proto-radio-scope," an instrument which makes use of the airjet principle, to record the pictures in a greatly enlarged state. Captain Ranger said that the photo-radio-scope and accompanying apparatus has recently been applied to the facsimile transmission of advertisements, messages, and holiday greeting cards, as well as for photographs.

Accidental reversing of the polarity of the leads from the set to the "A" battery is often the cause of a set's failure. Should these leads be accidentally reversed, great loss of volume usually results. Indeed, in some cases, the set will cease functioning entirely. Remember "like" goes to "like." The battery clip marked (plus), should be fastened to the battery post, or terminal marked (plus), and the clip marked (minus) to that marked (minus). The same rule of connection applies to the "B" battery. Should the "B" battery leads become reversed, however, the set will go absolutely dead, and no sound whatever will be heard from it.

Next time you shake hands with Thomas A. Edison (says the Chicago "Radio Digest") take a good look at the right side of his face. That is the side his genius is indicated. Note the shaggy belligerent eyebrow that will not behave, note the sharp penetrating quality of the eye, the general aggressiveness and push, while the other side of his face is genial and rather docile. These are facts narrated by John E. Garabrant, who has made 1500 photographs of the wizard, and always photographs taken from the right side.

At the third annual convention of the U.S.A. Institute of Radio Engineers at New York recently the first public announcement of a new radio receiving circuit, which permits the reception of the full "side-bands" from a broadcast station's signals without accompanying loss of selectivity, was made by Dr. Frederick K. Vreeland, radio experimenter, when he delivered his paper on the new set before the institute's evening session. The results are accomplished by using a system of balanced resistance, called a "band selector," inserted in the radio frequency stages of a set.

The "A" battery should really never cause much trouble through being run down, but these things do happen; and at times the "A" battery is the unsuspected cause of a set's failure to work. Keep a hydrometer handy and test your battery at intervals, and you will not have trouble from this source.

Owing to lack of support, broadcasting of European music has ceased in Shanghai. An effort is being made to obtain voluntary subscriptions to keep broadcasting going, but the inaugurators have so far met with little success. It is estimated that there are over a thousand European-owned sets in Shanghai, but only 130 have joined the China Broadcasting Association. Chinese music and items are on the air during the greater part of the day, but very few Europeans appreciate Chinese music. The voluntary subscription plan proved an utter washout in New Zealand.

Fifty broadcasting stations and three short-wave transmitters in the United States were expected to broadcast to the world the addresses of President Coolidge and President Machado at the opening session of the Sixth Pan-American Congress recently in Havana, Cuba. It was planned to enable the whole nation to hear the speeches from Cuba through the regular broadcast transmitters, while the short-wave installations, 2XAD of the General Electric Company at Schenectady and 8XK of the Westinghouse Electric and Manufacting Company at Pittsburgh, were to relay the voices of the American and Cuban Presidents to foreign lands.

Dr. A. N. Goldsmith, chief broadcast engineer of the Radio Corporation of America, is planning an extended experimental effort to communicate with Mars. If there are intelligent inhabitants on the planet he believes they will be able to comprehend a dot and dash code if there is sufficient repetition. The plan of attempted communication would involve the use of a huge beam transmitter or a bank of searchlights.

8.57: Soprano and tenor duet (at piano)—Miss Mabel Thomas and Mr. David McGill, "Asthore" (Trotere).
9.0: Weather forecast.
9.1: Relay of orchestral music from Everybody's Picture Theatre Orchestra.
9.15: Vocal solo—Mr. E. A. Dowell, "My Own Wild Irish Rose" (Olcott).
9.18: Pianoforte selections—Mr. Ivan Perrin, "Improvisations on Irish Melodies" (M.S.).
9.23: Contralto solo and choral refrain—Mrs. D. W. Stallard, "I'll Take You Home Again, Kathleen" (Westerndorf).
9.27: Instrumental trios—Christchurch Broadcasting Trio, (a) "The Last Rose of Summer" (M.S.); (b) "The Meeting of the Waters" (M.S.); (c) "Irish Jig" (Holbrooke).
9.37: Tenor solo—Mr. David McGill, "Eileen Allanah" (Thomas).
9.41: Songs at piano—Mr. E. A. Sargeant, (a) "For the Green" (Lohr); (b) "To My First Love" (Lohr); (c) "You Better Ask Me" (Lohr).
9.45: Zither banjo solos—Mr. Jack Oxley, (a) "Killarney" (Balfe); (b) "Merriment" (Morley).
9.48: Soprano solo—Miss Mabel Thomas, "Rich and Rare Were the Gems She Wore" (arr. Rimbault).
9.52: Recital—Mr. James Laurenson, "St. Patrick's Day" ('tis the greatest splash of sunshine right through all my retrospection) (J. O'Brien).
9.57: Soprano and tenor duet (at piano)—Miss Mabel Thomas and Mr. David McGill, selected.
God Save the King.

4YA DUNEDIN (463 METRES)—SATURDAY, MARCH 17.

7.15: News session.
7.30: Address on "Amateur Photography," by a member of the Camera Club.
8.0: Town Hall chimes. St. Patrick's Day concert.
8.1: Relay of orchestral music from the Empire Theatre Orchestra, under the conductorship of Mr. Chas. Parnell.
8.11: Baritone solos—Mr. Arthur Lungley, (a) "Eileen Allanah" (Thomas); (b) "Casey the Fiddler" (Wood).
8.17: Flute solo—Mr. J. Stewart, "St. Patrick's Day" (traditional).
8.20: Soprano solo—Miss Florence Sumner, "An Irish Lullaby" (Needham).
8.24: Cornet solos—Mr. George Christie, (a) "Grey Killaree" (Smith); (b) "Come Back to Erin" (Hoch).
8.32: Tenor solos—Mr. R. A. Mitchell, (a) "By the Waters of Killarney" (Sanders); (b) "O'Donnell Aboo" (traditional).
8.40: Violin solo—Mr. A. R. Watson, "The Kerry Dance" (Molloy).
8.44: Contralto solo—Miss Irene Horniblow, L.R.A.M., "The Last Rose of Summer" (arr. Moore).
8.48: Relay of orchestral music from the Empire Theatre.
8.58: Address on "The Music of Ireland," by Mr. J. P. Ward.
9.12: Baritone solo—Mr. Arthur Lungley, "Farewell, but Whenever" (traditional).
9.16: Flute solos—Mr. J. Stewart, (a) "Birth of St. Patrick" (arr. Garry Moore); (b) "Oft in the Stilly Night" (arr. Moore).
9.21: Soprano solos—Miss Florence Sumner, (a) "Danny Boy" (traditional Irish air); (b) "The Unseen Comrade" (Old Irish melody).
9.27: Cornet solo—Mr. George Christie, "The Farewell" (Harkmann).
9.31: Tenor solo—Mr. R. A. Mitchell, "The Voice from the Green Isle" (Slater).
9.35: Violin solo—Mr. A. R. Watson, "Kathleen Mavourneen" (Crouch).
9.43: Contralto solos—Miss Irene Horniblow, (a) "The Meeting of the Waters" (traditional); (b) "The Bells of Shandon" (arr. Moffat).
9.50: Relay of orchestral music from the Empire Theatre.
10.0: Close down.

Sunday, March 18th

1YA AUCKLAND (333 METRES)—SUNDAY, MARCH 18.

3 p.m.: Afternoon session—Selected studio items.
4.0: A literary selection by the Announcer.
4.30: Close down.
6.0: Children's hour, conducted by Uncle Leo, assisted by cousins from the Beresford Street Sunday School.
6.45: Close down.
6.55: Relay of evening church service from the Devonport Methodist Church. Preacher, Mr. Martin; organist, Mr. Len. Elliott; choirmaster, Mr. F. W. Beck.
During the evening, J. H. Maunder's "Song of Thanksgiving" will be rendered by the choir and selected soloists.
8.30: Relay of Municipal Band concert from the Auckland Town Hall. Bandmaster, Mr. Christopher Smith.
9.30: A thought.
9.32: Close down.

2YA WELLINGTON (420 METRES)—SUNDAY, MARCH 18.

6 p.m.: Children's service, conducted by Uncle Ernest, assisted by St. Peter's Choristers.
6.55: Relay of evening service from the Terrace Congregational Church. Preacher, Rev. Ernest R. Weeks; musical director, Mr. Len. Barnes; organist, Mr. H. Brusey.
8.30: Studio concert.
Vocal quartet—Etude Quartet, "There is No Death" (O'Hara).
Pianoforte solo—Mr. Gordon Short, "Rhapsodie in B Minor" (Brahms).
Baritone solo—Mr. Ray Kemp, "O, My Father" (Dubois).
Soprano solo—Miss Gretta Stark, "Songs My Mother Sang" (Grimshaw).
Instrumental trio—Symons-Ellwood-Short Trio, "First Part of Trio in a Minor" (Tschaikowsky).
Tenor solo—Mr. Frank Skinner, "A Song and a Dream" (Cadman).
Instrumental trio—Symons-Ellwood-Short Trio, "Second Part of Trio in a Minor" (Tschaikowsky).
Contralto solo—Miss Rita Arnold, "I Wonder If Ever the Rose" (Slater).
Vocal quartet—Etude Quartet, "Rest, Gentle Maiden" (Bishop).

3YA CHRISTCHURCH (306 METRES)—SUNDAY, MARCH 18.

5.45 p.m.: Children's song service, conducted by Uncle Sam, assisted by scholars from the Papanui Methodist Sunday School.
6.30: Relay of evening service from the Church of Christ, Moorhouse Avenue. Preacher, Rev. Howard Earle; organist, Miss E. Hepburn; choirmaster, Mr. H. Ames. Choral and solo items included in church service.
The following concert will be given from 3YA studio after the church service:
8.0: Soprano solo—Mrs. Frank O'Brien, "The Dear Little Shamrock" (arr. Rimbault).
8.4: Clarionet solo—Mr. M. E. Withers, "Adagio from Concerto, Op. 107" (Mozart).
8.9: Tenor solo—Mr. Frank Morrison, "God's Garden" (Lambert).
8.12: Recitation—Miss Maiona Juriss, A.T.C.L., "The Gift of Tritemius" (Whittier).
8.17: Contralto solo—Miss Constance Flamank, "The Enchantress" (Hatton).
8.21: Pianoforte solos—Miss Bessie Pollard, A.T.C.L., (a) "Folk Song" (Mendelssohn); (b) "Scherzo Cappriccio" (Mendelssohn).
8.26: Soprano solo—Mrs. Frank O'Brien, "Believe Me If All Those Endearing Young Charms" (arr. Rimbault).
8.31: Clarionet solo—Mr. M. E. Withers, "Mignon" (Thomas).
8.36: Tenor solo—Mr. Frank Morrison, "Vale" (Russell).
8.39: Recitation—Miss Maiona Juriss, A.T.C.L., "White Roses" (Barclay).
8.46: Contralto solo—Miss Constance Flamank, "Entreat Me Not to Leave Thee" (Gounod).
8.52: Pianoforte solos—Miss Bessie Pollard, A.T.C.L., L.T.C.L., (a) "Shadow Show"; (b) "La Reveille-Matin" (1668-1733) (M.S.).
God Save the King.

4YA DUNEDIN (463 METRES)—SUNDAY, MARCH 18.

5.45 p.m.: Children's song service, conducted by Big Brother Bill, assisted by some young singers from Knox Church Sunday School.
7.0: Relay of harvest festival service from Methodist Central Mission. Preacher, Rev. W. Walker; organist, Mr. Chas. A. Martin.
8.15: Studio concert.
9.15: Close down.

Dealing With Amplifier Distortion

A Talk About the Causes

By "Megohm"

SEVERAL correspondents complain of "blasting" and distortion of the output of their receivers, situated a considerable distance from 2YA. This is usually a matter between the last audio valve and the loudspeaker, and without actually hearing their performance it is difficult to say whether one or both is to blame. Every outfit has its limit as to the amount of undistorted volume that it can deliver, and listeners very frequently like to obtain the greatest amount of volume possible from their set. With no reserve of volume whatever, it is a sure thing that blasting will occur just as soon as a speaker gets "worked up," or a band or orchestra arrives at a double-forte passage. Distortion may be noticed just as much on high notes as on low ones, and however low an impedance valve may be employed in the last stage, if volume is being taken without any reserve, blasting or distortion is certain on passages above the average intensity.

If a cone speaker has a "papery" sound, it is not the fault of the cone, but a sure sign that the last valve is overloaded, and the cone enthusiastically responds to the high notes introduced by the overloaded valve. These high notes would be suppressed by a horn speaker. The installation of a power-valve will effect a cure.

Our ears get very insensitive on the very high and low notes, so that unless these are much amplified we do not appreciate them. It is the fault of most amplifying systems that they amplify the central portion of the musical scale quite well, but, according to the particular system employed, they fall off more or less badly on the extremes. And we must drag the loudspeaker into this argument too, for it will not always reproduce perfectly good extreme notes that are put out by the last valve.

Weakness of High Notes.

VERY high musical notes are inclined to be weak when reproduced, partly because they have not been amplified to the same extent as the body of the piece, and partly because the speaker passes them on weakened, or even distorted. This action is noticeable on high violin or piano notes, and whistling. If your outfit reproduces these with volume somewhat proportioned to the whole, then that is good. But the insensitiveness of the ear also creeps in here, and although there may be fair amplification of these high notes, unless it is exaggerated we may only hear them weakly. We distinguish one instrument from another by the overtones or harmonics produced with the fundamental or actual note, and when we get high in the scale we are unable to tell whether we can hear these harmonics or not, and that has a deal to do with the weakness of high notes, and the difficulty sometimes experienced of discriminating between high piano notes and those of a piccolo or a xylophone.

Results on Low Notes.

WHEN we come to the low notes conditions are very similar, though in some ways more difficult. As the ear loses its sensitivity on the low notes, it takes a tremendous amount of energy to make the ear appreciate the sound, and this energy causes a heavy tax on the capabilities of the amplifier and speaker, so that in descending we arrive at a point where it is decided that the "game is not worth the candle," or that it is not worth the expense and bulk of supplying an amplifier that will serve to make properly audible any notes below this point. Our amplifier and speaker, a cone, may be amplifying tolerably well down to 100 or even 80 cycles, but below that it will be attempting to amplify notes, but only producing muffled sound with distortion. The broadcast station may settle the matter for us and decide to cut off at, say 60 cycles, so that if we can bring about some improvement in our lower note amplification, we shall get all there is to get, though in practice the transmitter will be likely to be putting out notes of a lower audio frequency than a receiver is likely to reproduce. And if any transmitter were changed to send out no frequencies below 100, probably a large number of listeners with reproducers weak on the low notes would notice an actual improvement in their reproduction.

Quality of Musical Harmonics.

BUT this cutting off of low frequencies must not be overdone at the transmitter, because although a horn speaker of a certain type may not be able to reproduce such sounds at their actual pitch, it can lead you to believe that it is doing so in this way. Musical sounds are rich in harmonics, as already mentioned, and these give the instrumental quality to the sound. These harmonics, several in number, are all higher than the fundamental note. When a low note comes through a small horn speaker, the latter is probably quite unable to reproduce this note, with a frequency of, say, 60 cycles. If harmonics did not accompany the sound, it is quite likely that nothing of this note would be heard behind the melody. But the horn is able to mislead us by reproducing the harmonics down to the lowest one that it is capable of passing on, and quite likely the lowest one will be somewhat muffled or distorted. Listening to a horn speaker by itself, it is difficult for even a musical ear to decide just what lower notes are being suppressed, owing to the reproduction of their "ghosts" or harmonics, which may easily be considered to be the fundamentals. The only way to realise the difference of reproduction is to sit between an ordinary horn speaker and a cone that emphasises the lower notes. This has been done by the writer, and is a highly interesting study.

Two Loudspeakers Used.

FOR several years the Zenith Company of Chicago has supplied two loudspeakers, a cone and a horn, in all its cabinet sets, and some time ago, as already mentioned in this column, the writer adopted this idea. With the two speakers connected in parallel, and with a good choke filter in the circuit, the tendency for speaker overloading is very greatly reduced, and a much more faithful rendering of the studio items is obtained. But in this method there was still the attempt of the horn speaker to reproduce notes below its ability, and to distort them in the process. As the principle of utilising two speakers is for the horn to take care of the high frequencies and the cone the low ones, it was decided that any attempt on the part of the horn to deal with low frequencies must be suppressed, and this was accomplished by placing a fixed condenser of, say, .005 or .01 capacity in series with one of the speaker leads. The result was a considerable improvement in tone, any tendency to "mushiness" on low notes being cut out. The exact value of condenser must be found by trial, but if too small it will cut out at too high a position on the scale. It is not suggested that every horn speaker used with a cone should be fitted with a series condenser, but the idea is put forward for the experimenter who is continually striving to improve the quality of musical reproduction and speech too, and who is not prepared to sit back and say that his reproduction is "perfect." It may seem a large outlay to many to run two speakers, but it goes a long way towards settling a vexed question. After all, those who have run one speaker for a time and increased the output of their set can help quality reproduction in a way that is probably impossible with any internal alteration of components by purchasing a speaker of the opposite type to the one they already possess. An output filter or transformer is of course essential, and after these improvements have been carried out, further refinements may be gradually carried out in the hook-up. A resistance unit is easily tried in place of a transformer. This idea of two speakers has already been dealt with by the writer, but is good enough to be repeated.

The Effect of Power Valves.

IN the matter of valves, all set-owners have a free hand, so far as the last audio valve is concerned, with the reservation that where dry B batteries are employed the power-valve in the last stage will be limited to a reasonable plate current, in order not to put too much of a drain on the battery. Where a B accumulator or eliminator is in use the consideration of plate current is practically negligible. In such case, if the last audio valve is, say, a 112, and is overloaded, then the substitution of a 171 will effect a great improvement, but the appropriate grid-bias must be provided and kept near the correct voltage by occasionally testing the dry C battery with a voltmeter. Then, as a last resort, there is the 210 type of power-valve, which will handle big volume, but takes from 6 to 7½ volts and 1.1 to 1.25 amps on the filament, and works best on a plate voltage of 200 to 400, taking up to 22 milliamps. This last-mentioned valve, it will be seen, is essentially one for operation from a B eliminator giving high voltage, and where a transformer winding is available for heating the filament, thus saving the necessity for extra A battery voltage to run the valve at its best output.

It should be noted that no receiver giving loudspeaker volume, and employing a 201A tube as the last audio amplifier, is capable of quality reproduction, as there is sure to be overloading and distortion. Receivers giving distorted output will usually be improved by changing the last valve for one capable of handling the volume without distortion. For a 201A a 112 may be substituted, for 112 a 171, and for 171 a 210, but the latter only if high plate voltage is available. At 135 volts on the plate the 112 requires the same grid bias (9 volts) as the 201A, but takes 6 milliamps instead of 2.5 on the plate.

This may be economically run from a dry B battery of not too small dimensions, and the writer knows that some listeners are running 20 milliamp valves off dry batteries of ample proportions, and, needless to say, are getting good results, though the batteries will not last the same time as when running a set with a total plate current of 8 to 10 milliamps.

If you wish to step up from the 112, then the 171 is available. This valve will take a plate voltage up to 180 volts, which requires the high grid bias of 40½ volts, and passes 20 milliamps. At 135 volts on the plate the grid bias is 27 volts, and plate current 16 milliamps. The filaments of the above valves all run off a 6-volt accumulator, but the correct voltage at the filament terminals of the valve-holder is 5 volts. The UX120 is only a semi-power valve, and will not carry any great volume. The filament requires a 4-volt battery, or 4½ volts, 3 dry cells, for which use it is most suited. Plate voltage runs up to 135, 6.5 milliamps being passed.

Gradual Distortion May Creep In

THE most troublesome form of distortion is that which gradually creeps in. When the set is first installed reproduction may be amazingly good, and yet quality will gradually fall off week by week in such a way that it is not noticed by the listener, until it at last gets obtrusive and calls for attention. It is very easy to forget about amplifier valves, yet they may have gone off to such an extent that their emission has fallen much below the point where they can carry the low audio frequencies without distortion. With an eliminator the deterioration of the rectifying valve may be reducing plate current, or a dry B battery may have parted with its quota of milliamps and have a residual voltage not worth consideration. Then there is the grid-bias battery, so easily neglected, yet so important where quality is sought.

It is important to tune in the dials to the exact maximum reading, and reduce volume by other means than detuning with the dials, which may easily introduce distortion. Dimming the R.F. filaments is one of the best means of volume control, which has the advantage of preventing the detector from being overloaded.

THERE are many other sources of distortion, but those connected with the last valve and the loudspeaker are the most common, and are at the present time causing anxiety to a number of listeners, which is the reason for this article, which contains much that is not new, but will, it is hoped, be helpful to those suffering distorted reception.

ACTION OF THE SCREEN-GRID

THE UX 222 VALVE

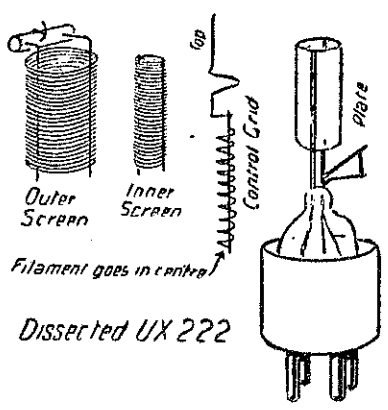
(By "Megohm.")

THE construction of the UX222 screen-grid valve is fairly complex in comparison with the ordinary receiving valve. The extra grid consists of two circular screens of wire, one encircling the outside of the plate, the other inside the plate, between the latter and the ordinary control grid, the lead for which comes out at the top of the valve. In the very centre of all is the filament. The two screen-grids are connected together, and the lead brought out to the ordinary grid connection of the valve base.

The sensitivity of the control exerted by the grid (and hence the amplifying value of the valve) is definitely limited by the cloud of electrons surrounding the filament. If an extra grid is interposed between the filament and the regular control-grid, and charged positively, it will, by virtue of its proximity to the filament, break up the cloud and increase the control range of the regular grid.

The extra grid may also be located between the control-grid and the plate. Here it will require a higher positive charge than before, but it now also serves another purpose—namely, to reduce the troublesome capacity effect between the grid and plate. It acts as an earthed centre plate, splitting the "fixed condenser" formed by the grid and plate into two smaller condensers in series.

As already mentioned, the outer screen encircles the plate completely. The inner section acts both as a space-charge disrupter and as a capacity re-



ducer, while the outer section (which has nothing to do with the stream electrons, because they stop at the plate), serves merely to reduce the capacity between the outside of the plate and the connecting leads, etc. It should be noted that the inner screen-grid is chiefly concerned in the following remarks.

The "space-charge" spoken of is the negative charge of the cloud of electrons hovering round the filament, and which have been unable to travel to the plate through being insufficiently heated, and so having too low a velocity, and therefore easily retarded by the space-charge. Increased plate voltage decreases the space-charge, which means that more electrons reach the plate. As the control grid is nearer to the space-charge than is the plate, variation in the grid voltage has a greater effect, in proportion, than changes in plate voltage, so that small grid voltage variations make large plate-current variations, which gives the amplifying effect.

Now, this space-charge is actually detrimental to the working of the tube, and the cause of its low efficiency, because its repelling effect is added to the repelling effect of the grid, and so any change in the repelling potential of the grid is only a partial change in the whole repelling potential. If we could wipe out the space-charge altogether, and leave the grid with the only negative charge, then grid variations would have a much greater percentage effect upon the whole negative charge, and the amplification factor would at once rise from 6 or 8 to perhaps 30. This because the change in repelling effect of the grid is complete in itself, and no energy is wasted in "gingering up" the drowsy encumbrance known as the "space-charge," which has now been cut out by the interposition of the positively-charged extra grid between the plate and grid.

In ordinary valves, 85 per cent. of the plate voltage is used in overcoming the space-charge, and the remaining 15 per cent. in establishing plate current, so that by removing the space-charge the 85 per cent. of high-tension voltage needed to overcome it may be in future saved, and the valve will operate with only the 15 per cent. required to establish current through the valve. This means that where 100 volts was formerly applied to the plate, with the screen-grid 15 volts, would give an equal result. On the other hand, instead of thus reducing plate voltage, and getting equal results, we may in practice keep the plate voltage as before, and thus obtain increased amplification from the greater electron stream from filament to plate that is affected by the grid voltage variations.

It is by placing a positive charge at the point where the negative charge accumulates that the extra (inner) grid obliterates the space-charge. The extra grid is really doing part of the work of the plate, but by its position near to the source of the trouble it is able to do this part of the work more efficiently than the plate can.

This is a brief description of the two main points in the action of the new valve.

TIPS AND JOTTINGS

(By "Megohm.")

A CORRECTION.

In a recent article on two-valve amplifier a misprint caused "2 inches" to appear as the diameter of the tuning-coil for the crystal. Further down the same page, however, the correct diameter, 3 inches, was mentioned.

B ELIMINATOR SUCCESSES.

SINCE publishing the success of a Christchurch constructor of the "Record" B eliminator, we hear of several others that have been running satisfactorily for some time. Naturally many constructors will not think of sending in a report of their success, but the writer is just as pleased to hear of such as he is to help any constructor who is confronted by a difficulty.

GLOW-TUBE EXTRAVAGANCE.

THE use of a "glow tube" regulator in B eliminators sometimes improves the stability of the R.F. circuit, and reduces the tendency to "motor-boating" and oscillation on the audio side, but unless the eliminator will give an extra 30 milliamps without too much of a drop in voltage, the "glow tube" should not be used. Such regulation is therefore only attained at the expense of a heavy drain on the eliminator output.

A CARTRIDGE CHARGER WARNING

LISTENERS who have employed a bulb rectifier battery charger always connected to the battery so that switching on the current to the charger would set the battery charging, must remember that if they change over to a Raytheon A charger, they must provide a switch to open the charger circuit. The cartridge rectifier may allow a drain of as much as 180 milliamps to pass if left connected to the battery when not charging, and this leakage will run down an A battery in two or three days. A d.p.d.t. switch to throw over for set or charger is the best arrangement.

THE LOUDSPEAKER POSITION.

COMMENTING on the excellence of the few loudspeakers, and the need for improvement in the many, "Radio Broadcast" says: "It is our opinion that improving the loudspeaker will spell trouble for the designers, manufacturers, and owners of a.c. sets. With a Balsa (wood diaphragm) loudspeaker which we operate with a Western Electric 540-AW unit out of a single 171 tube with about 160 volts on the plate, the average a.c. set is too noisy for pleasure, although on other loud speakers the hum is inaudible. In other words, the a.c. tube either marks the limit of loudspeaker development, or the newer and better loudspeakers will force a.c. tubes to deliver signals unruffled by a.c. hum. We hope the latter, for the average loudspeaker of to-day is less than 5 per cent. efficient, considering the entire audio band to be passed."

The League of Nations as a Factor in World Peace

Radio broadcasting undoubtedly takes a high place as a definite factor in world peace because through it the barriers of distance and misunderstandings are reduced. Another force working definitely and objectively to the same end is the League of Nations and listeners from 2YA were recently afforded the opportunity of learning something of the League's work from a New Zealander on its permanent secretariat, Mr. J. V. Wilson. The main points of this address are here reproduced.

THE League of Nations, to which nearly all the States of the world belong, does many things for the common good of its members. To name a few examples among many, it works to prevent the spread of disease, to adjust economic and labour conditions between nations, to suppress evils like the drug traffic. It is in everyday, unspectacular work of this kind that the Assembly of the League and its permanent Secretariat at Geneva (as a member of which I have been honoured by an invitation to address you) is chiefly occupied. If you were to read one of the many pamphlets on the League's work you would, I think, be surprised at the number of tasks with which the League has been entrusted, and at their wide scope—for the League's work is universal, and not merely European, as some people think.

There is, however, one work of the League in which everyone may be expected to take some interest, and that is, what it does to prevent war; and first let me refer to what the League means to Britain, to which, of all countries, peace must remain the supreme political interest.

THE ATTITUDE OF BRITAIN.

AT the last Assembly of the League, in September, the Foreign Minister of Great Britain, Sir Austen Chamberlain, after consultation with the representatives of the other parts of the British Empire, said: "We base our whole policy on the League of Nations." This, or similar declarations, have often been made by the British Government. Moreover, not only the present Conservative Government of Great Britain, but a Labour or Liberal Government would certainly say the same.

Now the British Government has always had the reputation of being realistic in politics, and we may take it that when it declares that it is on the League of Nations that it bases its whole policy and the security of the vast interests it has in its charge, it thinks that it is not building on sand. What does this profession mean? It means, essentially, that we see in the League system a better means of keeping the peace than in the old systems, such as alliances. The kernel of the new system is this: that when a threat of war arises, the Council of the League of Nations shall, on the demand of any one member of the League, meet in order to attempt to effect a settlement. This Council is a body which has a right to be heard in such a case because on it sit the representatives—usually the Foreign Ministers themselves—of the great Powers, except, of course, those two which still remain outside the League of Nations—the United States and the Soviet Union—and also representatives of smaller countries. In the face of so representative a body a State which desires to go to war finds itself condemned by the general opinion of the world, and that is a thing which no nation, however strong, can lightly challenge. Experience shows that even if, in a given crisis, one or two countries would be glad to see war break out, the great majority desires peace to be maintained. The problem is how to make this desire effective, and, by forcing the nations to confer, the League's machinery makes possible, to an extent unknown before, the mobilisation of those forces working for peace. In 1914 Sir Edward Grey tried to anticipate the League system: he asked for a conference of the great Powers, but then there was no obligation to confer.

A PRACTICAL TEST.

THIS system has been put to the test more than once. The latest example occurred two years ago when, owing to a frontier incident, hostilities had actually broken out between Greece and Bulgaria. A telegram from the Bulgarian Government to the Secretary-General of the League of Nations, asking for a meeting of the Council, was received at Geneva about 6 o'clock one Monday morning. Within three days the Council met. The conflict was stopped and reparations were exacted from and paid by the nation which was judged to have been in the wrong. Things would not always work as smoothly as this, but such were the facts in this case.

BUT often, as we know, there is tension between countries for a long time before there is any threat of war. Can nothing be done to relieve this tension before war looms near? The situation, too, is provided for in the Covenant of the League of Nations, which declares that it is the friendly right of any member to bring before the Council any circumstances whatever which threatens to disturb the peace of the good understanding between nations on which peace depends. This "friendly right" has been used many times, with good results. Many gathering storms have been dispersed by early reference of a dispute to the Council, which has been able to use its conciliatory influence. The most recent case is that of a quarrel between Poland and Lithuania, dealt with by the Council at its regular three-monthly meeting last December. By the way, lest it be thought that because neither of these countries is a great Power the dispute itself was of small moment, it may be as well to say that if it had been aggravated it might easily have involved Germany, the Soviet Union, and other Powers. One might say, "Yes, the League is helpful if countries use it, but what of the Great Powers who warn the League off when they themselves have a quarrel?" This "hands off" attitude is certainly not infrequent, but it will not wholly disappear even when the League acquires that full authority to which it is tending, because in a given dispute it will always be a matter of opinion whether a settlement could best be obtained directly through diplomacy, or by a full international discussion through the League. But when a dispute becomes really grave, or war seems imminent, it seems inconceivable that even at the present stage of the League's development it should not be referred to the Council, whether it affected a great Power or a small Power.

IS THERE CO-OPERATION?

SO far I have been dealing with the League's methods of action in crises. Now, people may admit that the new methods are better than the old, but, as methods and machinery are not everything, will feel that no real progress has been made because of a supposed absence of the spirit of co-operation. This objection certainly has weight. Nations have not yet acquired full confidence in one another, and it is well to realise that the growth of this confidence—the sole sure basis of peace—will take time. Take the present concrete problem of the reduction of armaments. Many nations (Great Britain amongst them) desire, both for reasons of economy and for reasons of policy, a big reduction of armaments, and, above all, the cessation of international competition in armaments. The problem is approaching a critical stage, and you will see from the papers that preparations (in which you are taking part, not only as members of the League, but the powers outside the League—such as the United States and the Soviet Union), are being made for a first conference on the reduction of armaments. It is possible that such a conference will achieve little more than a general limitation, and slight lowering of the present scale of armaments. Yet even a slight reduction voluntarily agreed to by all nations will be a gain, and will tend to create that mutual confidence which will make further and bigger reductions possible. In a way, the success of the league in any one of its works is a thermometer which registers the degree of the world's willingness to co-operate. Sometimes the mercury mounts fairly high, sometimes it drops near to zero; the simile is not perfect, because the league thermometer itself helps to raise the temperature. The Geneva atmosphere, of which a good deal—perhaps too much—is said, has helped to solve many tough problems, but it is nothing miraculous, it merely means the spirit of mutual understanding and compromise, which we have long known in everyday life, but are slow to believe to be applicable to international affairs. This readjustment of opinion is taking place more quickly in some countries than in others, and the fact that the league works with growing success in so many fields is assisting it. If you read attentively the newspaper reports of the work of the League, even if you read no more, you will, I think, come to feel that the League has salvaged much of what has good in the aims of those who fought; and when you think in terms of practical politics of what the alternatives are to the programme of co-operation, which the League sets forth, you will, perhaps, feel less surprise that the leading statesmen of this Empire should declare that they base their whole policy on the League: you will realise that the League has already achieved much, and, given popular interest, will achieve more.

I HOPE I have helped to show the progressive nature of the League's growth, and to correct the common idea that it is an organisation maintained at huge expense to announce to the world that there can be no more war. To prevent war is indeed the principal aim of the League, but the League makes no prophecies—it merely works. Its cost, by the way, to the people of New Zealand, is 1½d. per head per year.

Views in Our Mail Bag

Daylight Saving and Other Points.

N. Cole Baker (Port Waikato): I send my comment on Sidey Time, though aware that I am rather late in doing so. From the point of view of the farmer (not dairying), I look at it in the following ways. (1) For working hours, we have always worked by the sun and continue to do so. (2) On holidays it is a decided advantage in town to get to shops, banks, etc., an hour earlier, to country people, who are habitually early risers. A great deal of time seems wasted in the city on a summer morning. When travelling, especially by car, you can get on the road earlier, when travelling is most pleasant, as the hotels will give you a meal earlier, and garages are open, etc. (3) For the radio. We miss all the children's sessions and almost of the news session, and in midsummer, the first hour from the more distant stations. (I don't agree with those who complain of missing the Aussie stations, as they can sit up if they want to.) However, considering the decided advantages of Summer Time, I think the transmission hours should be put off an hour, and the same applies to all indoor entertainments, as there is no benefit to the health of the people to let indoor workers out an hour earlier and then invite them in again to pictures or radio when it is still daylight.

Now for the programmes. They are good, and are improving, but I am afraid the 1YA Trio are not making friends as they should. That they are good musicians, and play high-class music, there is no doubt, but we require education, and they must lead us up gradually. My own standard, which, I think, is fairly representative, includes such works as Bragas' Serenata, Henry VIII Classics (German); Intermezzo "Cavaleria Rusticana," "Faust Overture" (Gounod), "Spring Song," "Melody in F," "Brooklet's Tale" (Jurgmann); "Romance" (Spendsen), "La Paloma," "Blue Danube Waltz," etc. The point is that, as loudspeakers are to be found in average homes, you must supply them with music which sounds natural in that setting, otherwise it has a "canned" effect, and not all music "cans" well, though some does, as, for instance, a brass band always goes well on gramophone or radio.

"P.T." (Rotorua) writes: "Since reporting my reception of KGER, Long-beach, California, I have received confirmation from that station. An extract from the letter reads, "We checked over our programmes of the past and found your reception was correct, and I am enclosing one of our own KGER verification stamps. KGER is operating on only 100 watts." I have received verification of reception from many American stations, but look upon the receiving of KGER as my best effort on the normal wave band. Had the station been heard only the once, I would not have deemed it as such, but I can rely upon receiving the station under average good conditions. At times, now that the days are drawing in, KGER comes through at fair speaker strength. Of course, under the same conditions, KFON, Longbeach, California, is quite as strong as 3YA. In passing, I heard KFON announce just recently that they have received permission and are increasing power to 1500 watts. In that case, they should be received in most parts of New Zealand at respectable strength. The American stations are now thick on my dials. Thirty-seven have been heard during the past two weeks.

High Brow Taste Growing.

Workaday (Christchurch): Despite what all the "lowbrow" people may say, if there is one thing that the Broadcasting Company deserves credit for it is the standard which has been set in regard to music. It will be a sorry day for broadcasting when the powers that be agree to cater for the wishes of only the lowbrows. I am not a highbrow nor a lowbrow—I am just between the two in regard to music, with an inclination of late to qualify as a highbrow. I have been a consistent listener for a long while, and I am proud to say that I have now a keener appreciation of what is good music. So must anyone who listens in to any extent. Judging from my own experience, and many people must be like me, broadcasting must mean a great revival in music, that is, of course, if it is taken full advantage of by all lovers of music. There is no greater medium for the intellectual and artistic uplift of the nation than this modern miracle of radio broadcasting, which takes the best of the world's music right into the homes of the people. Music, such as the lowbrow correspondents want, would have a debasing effect on the people. There are enough influences in that direction already. Such lowbrows are not obliged to renew their licenses. They are really so few that the Broadcasting Company would never miss the loss of their license fees.

Length of Sermons.

Cashmere (Christchurch): I noted in this issue of the "Radio Record" that Professor Shelley, of Christchurch, speaking with reference to the length of lectures, said that the average person could not listen to a lecture over the wireless for longer than a quarter of an hour, and take it in. I hope this remark will meet the eye of all church ministers, and that they will restrict their sermons to somewhere near that length of time. On Sunday evening there was a sermon that must have gone a full 25 minutes—ten minutes too long to please radio listeners, whatever may have been the effect on the congregation. It is worth while for preachers to cater for their unseen audience more than they do. They should also talk more into the microphone.

Radio in Napier.

I read Dr. Ziele's article in this week's issue with much interest, and if it was not for these howlers radio reception would be very good here now. The Australian stations are nearly all coming in here as loud as Wellington, and last evening 2BL and 2FC were roaring in at 8.30 N.Z.S.T. The children's session was plainly heard from 2BL.

Last evening while listening to a talk on "Politics and the Humour of it" from 2YA, I was surprised to hear a man's voice talking very quickly and almost as loud as the speaker at 2YA. I could not understand what this new voice was saying, as it certainly did not sound English to me. Could you or any reader who may have heard this tell me the location of this strange station. The time was about 9 o'clock, and the voice was heard during other items as well. I am very curious to know what station it was.

2FC's relay of 2LO came in here wonderfully well last week, as well as 2BL, 2GB, 3LO, 3AR, 1QG and 2KY. I heard 5CL, Adelaide for the first time last week. The Aussies are good to listen to, as there is no fading. I had a new Aussie station last night, but could not hear the announcement, as static was rather bad. I think it was 2UW. KFON can be heard every evening until about 9.30, but fades very badly.

I think 3ZC is a wonderful little station, as he comes in here very clearly and does not fade. 4YA is as loud as Wellington in the latter part of the evening now. Listeners here will be glad when Daylight Saving comes to an end; as there will be no need to sit up late for Aussie stations, and 1YA and 3YA will come in better also, as they are not very good until dark.

The programmes from New Zealand stations are all that can be desired, but listeners would like to hear orchestral music from 2YA. Could not a studio orchestra be formed and one or two of the big picture theatres be relayed. This would be very acceptable as well as a change from the excess of singing. I have not heard Mr. A. A. Crump and Mr. Barrett and several other clarinet soloists for a long time. Would like to hear a few more clarinet solos, as they are good and come through well.

2YA's afternon sessions are always good, as there is no fading and no static in the afternoon.

Are the Gisborne and Palmerston North Radio Societies broadcasting now, as I have never heard them? and if 3ZC comes in so well I think they could be heard here.

The set I use is a 5-valve, and I am more than pleased with the results obtained in this recent hot weather.

In conclusion, I hope that something will be done to stop howlers in this district and also that 2YA will put on orchestral music in its evening sessions. I hope to hear who the station is on 2YA's wave-length.

News from 2YA on Silent Day.

"Listener-in" (Ohakune).—When I suggested a new hour on Wednesday from 2YA, now silent on that day, I saw no reason why this should compel the staff to work seven days weekly, and although I understand little about the running of a broadcasting station, I think if it could be arranged to broadcast the news on that day the extra cost would be far more than balanced by the great benefit to farmers. Your correspondent from Bay of Islands cannot get 2YA in daylight, so he does not want the other listeners to get in on him. Sour grapes, is it not?

2YA's Reception.

F. J. Shanley (Wanganui).—In last week's "Record" you asked for a report of your transmission. With the exception of the "Maori" night and the 20th, 21st, 22nd, and 23rd of this month, 2YA has not been clear; there being quite a blurred effect. There is quite a striking contrast when turning over to 2BL (Sydney), where the signals come through as clear as crystal. I am quite sure that with vocal items and speech that the artists are too near the "mike." We have found that the artist with a smaller voice comes through much clearer. The Symons-Elwood trios come through well, and are a treat. The band items come through well, as they are at the end of the studio (I was through it at the New Year). Mr. Haywood's mandoline solos the first two weeks were very good, but of late it has been a piano solo, with mandoline accompaniment, which is not fair to the artist, who is good on the instrument. This remark applies the same to other artists where the piano is too loud. You will pardon my plain remarks. I like 2YA very well, and it is only with the hope that your broadcast may be even better that these lines are written.

[If you get 2BL clearly, is there any chance of your set being overloaded for 2YA?—Ed.]

ANSWERS TO CORRESPONDENCE.

"G.S." (Dannevirke).—The particulars of the station are so meagre as to render its identification impossible.

Some Features of Next Week's Programmes

1YA NOTES

Mr. E. C. Cutten, S.M., will give a talk at 1YA on Monday evening. His subject will be the League of Nations' child welfare work.

Solos which Miss Phyllis Hazell will sing on Wednesday evening during the municipal concert in the Auckland Town Hall will be "A Summer Night" and the "Fishermen of England." The duets which she will sing with Mr. Sutherland will be "Marcheta" and "Miserere" (from "Il Trovatore"). Mr. Sutherland's solos will be "Lorraine" and "Youth."

The vocalists for Thursday at 1YA will be Miss Mina Caldow, Miss Lolo Solomon, and Mr. Barry Coney. Miss Caldow's songs will be "The Little Damozel," "In Summer Fields," and "The Poet's Life." Miss Solomon has two pretty songs by Lehmann and one by Chaminade. Mr. Barry Coney's will be Head's nocturne "Had a Horse" and "It's Very Vexin'." Items by the Bosworth-Hemus-Towsey Trio, Mr. Cyril Towsey (piano), Mr. Victor Bedford (flute), with overtures from the Rialto Theatre, will comprise the instrumental section of the programme.

The station announcer will continue his interesting series of talks on "Great Authors" at 1YA on Thursday.

Miss Beryl Smith and Miss Alma McGruer will be singing solos and duets at 1YA on Friday evening. These popular vocalists have chosen songs that will please. So also has Mr. Clinton Williams (baritone). The items to be given by Mr. T. Harris (elocutionist), will be "By the Yukon Trail," "Not Old," and "Pink Dominoes." Mr. Fred Bowes (cornetist), Ingall's Hawaiian Instrumentalists, and the Strand Theatre orchestra will provide the instrumental music.

During the early session on Friday evening Mr. George Campbell will give one of his talks on motoring.

A feature of the broadcast of the Devonport Methodist service on Sunday will be the singing of J. H. Maunder's "Song of Thanksgiving" by the choir and selected soloists.

2YA NOTES

In addition to playing a number of lighter works, the Symons-Ellwood-Short trio will play movements from Beethoven's first trio, Brahms' first trio, a trio by Hummel, and the first movement of the mighty trio in elegiac vein by Tschaikowsky. Music lovers will be greatly interested in comparing the Mozartian light-heartedness and simple harmony of the youthful trio of Beethoven with the deep expressiveness and rich harmony of the trio by the likewise youthful Brahms. This trio is an interesting example of the self-criticism of the very greatest minds. During the last years of his life Brahms revised this trio, his first effort at chamber music, and made a number of alterations to the already long published version, all of which are improvements in the direction of breadth and simplicity. The opening melody is one of very special beauty and the rich harmony of the first movement suggests an orchestral fullness. The whole movement exudes an abandon and ecstacy redolent of vigorous youth, with the exception of a few bars towards the close, in which the 'cello and violin have some bars of heavenly sweetness against a delicate tracery of pianoforte sound.

The first movement of the Tschaikowsky trio is a massive monument in the field of elegiac music. The trio was written in memoriam to the great Russian pianist-composer, Nicholas Rubinstein, and in the first movement dignity of grief contrasts with the song of triumph over death. This is one of the most stirring movements in the whole of chamber music literature.

Miss Ava Symons will play "Caprice Viennois" (Kriesler), "Rondino" (Beethoven-Kriesler), first movement Second Concerto (Weiniawski).

Mr. George Ellwood will play "Hamibdid" (Bantock), Largo from Concerto (Tartini).

On Sunday night Mr. Gordon Short will play one of Brahms' most effective and finest pianoforte solos, the "Rhapsodie in B Minor" (Opus 79).

On Friday evening Miss Glen Carty, winner of the special Beethoven gold medal at the Wellington competitions last year will play the first movement of the Beethoven Sonata, Op. 110, and a whimsical "Caprice" by Chbarier.

Supplementing the excellent programme to be provided by the Celeste Quartet on Monday at 2YA, listeners will have the pleasure of hearing Miss Maynard Hall, of Christchurch, in her interesting "Reminiscences of Hollywood." Miss Hall is a sister of Winter Hall, the actor, and was two years in the famous moving picture city.

Mr. Bert Duttons, with his cornet, and Mr. L. W. Rothwell, with his flute, will pleasantly augment the instrumental section of the Celeste Quartet's programme on Monday.

For their programme on Tuesday, March 13, the Orpheus Quartet have chosen some delightful numbers. The quartets include an arrangement by King Hall of Tosti's beautiful song, "Beauty's Eyes," and also that fine old number, "The Bells of St. Michael's Tower." Though the wedding bells ring merrily, the marriage is not at all happy, and Richard Penlake has to take a stick to Rebecca, his wife. Mrs. Alice Harris sings "O, Who Shall Say," the popular waltz song from "Merrie England," and also "Softly Awakes My Heart," from "Samson and Delilah," in which Delilah uses her wiles to entice Samson into the hands of the Philistines. Miss Lily Mackie will render "I Love the Moon," and with Mr. Len Barnes, "The Glory of the Sea." Mr. Arthur Coe will sing "You," by Phyllis Norman Parker, and a happy song, "Never Say Die," with the quartet chorus

Loewe was the writer of very many fine dramatic ballads, and perhaps the best is "Edward." The mother has bidden her son kill his father, and the impassioned dialogue between the two is well brought out in this number, particularly in the climax, when the son says to his mother: "The curse of hell on you shall fall, such rede ye gave to me." This number will be sung by Mr. Len Barnes at 2YA on Tuesday.

Other contributors to an attractive programme on Tuesday will be Pat and Walter, who will be heard in an amusing "Curtain Lecture," and Mr. Lad Haywood, whose work on the Italian mandolin is widely appreciated.

There is a lot of truth in the old saw "That it doesn't matter what you say—it's the way you say it." What these Mellow Fellows are saying to you, listeners, is somewhat after this wise:—"Don't forget that the Fellow who is doing his best is doing his best

to please you, and he's more sorry than you are that it isn't a better one." Joking apart, the Mellow Fellows are getting better (time, too, they confess!) and they will try and relieve the monotony a little on Thursday, March 15, by giving you, without extra charge, some more of their nonsesse. Our readers will remember that "A little nonsense now and then. . . etc." Note: For the present, the Fellows consider it safer not to disclose identities.

On Friday evening listeners will have another of the ever-popular Renshaw Quartet programmes. The concerted numbers will include a particularly interesting quartet by Abt, "Thus Spake, One Summer's Day," and another "Serenade," by Henry Smart. The solo items will without doubt, conform to the high standard maintained by this talented combination. Miss Nora Greene is to render "My Dear Soul," one of Sanderson's most popular ballads, eminently suited to her full contralto voice, to be followed by Sullivan's "Lost Chord," which will awaken memories in many minds. Mrs. Amy Dunn has chosen "A Brown Bird Singing," by Hayden Wood, one of our modern composers, and she will be associated with Mr. William Renshaw in a duet, "Love's Melody," which will be a particularly pleasing item on Friday.

Mr. Renshaw will include "An Eriskay Love Lilt" among his items at 2YA. This is one of the best known of the Hebridean songs of Mrs. Kennedy Fraser's composition. These songs have a very definite physiognomy and a very definite soul, both of them the result of the constant pressure of a very definite environment upon a people virtually isolated from the general life of Europe.

On Friday, Mr. Thomas C. Wood, of the Renshaw Quartet, always popular with the Wellington audiences and an established radio favourite, will delight with "Life's Epitome" and "The Arrow and the Song," this latter being especially suited to his fine rich baritone voice.

The Two Boiled Owls and Messrs. Berthold and Bent will also be "on the air" with their popular contributions on Friday.

On Saturday, March 10, the Melodie Four will be again heard from the studio of 2YA. Included in the concerted items to be presented is a very harmonious arrangement of the "Birth of the Blues" and an original number, "Interger Vitae," in which the quartet obtains some unique effects which should prove acceptable to listeners-in. So admirable is the blend of these four voices that in this particular number it is difficult to realise that the harmony produced is not that of an organ. Solo items will also be given as follow: Mr. W. W. Marshall (bass), "The Longshoreman"; Mr. S. Duncan (tenor), "A Dream"; Mr. R. S. Allwright (baritone), "Betty and Johnny"; and Mr. F. Bryant (tenor), "At Sundown."

LECTURES AT 2YA

During the week there will be two usual afternoon lecturettes on fashions and cooking.

On Monday evening at 7.40 o'clock Mr. South will give us an interesting talk on "Books Grave and Gay."

At the same time on Tuesday a representative of the Agricultural Department will have something helpful to say to the "Man on the Land."

Mr. Black, on behalf of the Tourist Department, will on Thursday, at 7.40 p.m., have something further to say about the scenic glories of the Dominion, and Mr. Paris will continue his instructive talks on "Athletics."

3YA NOTES

On Monday evening good fare can be expected again from the Bechenham Male Quartet, consisting of Messrs Odell, Archer, Pitman, and Jackson. Bright popular and humorous items always feature this combination's programmes, and make an irresistible appeal to listeners, so that, combined with the entertainment provided by Derry's Band and Miss Mavis Ritchie (humorous reciter), Monday evening's programme will be one of the most popular of the week.

"Going Up," the musical play which became such a rage, will be a feature at 3YA on Wednesday, having been chosen by the Aeolian Quartet for presentation. All the catchy songs of the piece will be sung, and the entertainment provided should, therefore, be of a very bright nature. Solos with chorus accompaniment are prominent. The vocalists will be Mrs. Claris Shaw, Miss Mildred Russell, Mr. Gregory Russell, and Mr. W. J. Richards.

A new elocutionist for 3YA on Wednesday will be Miss Winifred Smith, L.T.C.L., whose items will be "Yes, Papa," and Adam Lindsay Gordon's stirring "Baumerman of the Dandenong," a story of the Australian bush.

The ever-popular "Country Girl," the musical play by Lionel Monckton and Paul Rubens, will be produced for the radio on Thursday. The familiar tunes of the setting, in which the Rajah of Bhong moved, will be sung by Miss Frances Hamerton, L.A.B., Miss Belle Renant, Mr. Russell Sumner, and Mr. T. D. Williams.

Besides the items from the "Country Girl" on Friday, humorous recitations will be given by Mr. J. P. Darragh, "Guy de Vere's Mix-up" and "Fair Dinkum" (a coster item).

4YA NOTES

For band night on Tuesday, when the St. Kilda Band will play at the studio, there is a strong company of assisting artists. The vocalists will be Mr. C. C. Scott (tenor), Mr. Reg. Richards (baritone), Mr. Charles Rowland (humorous songs), Mr. J. B. Connell, and Miss Anita Winkel (elocutionary recitals).

Mr. R. W. Marshall, of the Government Tourist Department, will give a talk on Tuesday evening.

Some fine solos are on the programme for Thursday, when some of Dunedin's foremost artists will be contributing. Miss Winnie McPeate's rendering of "O Lovely Night" will have 'cello obbligato by Mr. Robilliard, one of whose solo items will be the delightful "Coronach." Miss Rita Holmes (soprano) has looked to the operas for her solos this time—"Madame Butterfly," "Lohengrin," and "La Tosca." Pianoforte solos will be played by Mrs. W. Munro, L.T.C.L. The male voices will be Mr. F. M. Tuohy (baritone) and Mr. E. G. Bond (bass).

The weekly address will be given by Pastor More on Thursday.

At 7.30 on Friday Mr. H. Greenwood, librarian at the Dunedin Athenaeum, will talk on "Books."

An hour's splendid programme will be broadcast from 4YA on Friday, after which dance music will be relayed from the Savoy. Contributing to the vocal portion of the programme will be Miss Roma Buss (soprano), Miss Mollie Andrews (mezzo-soprano), Mr. L. E. Dalley (tenor), Mr. John Macpherson (bass), Miss Sheila Wilson (elocution), and Miss Aroha Allan (piano).

A lecture of interest to all amateur photographers will be given on Saturday evening at 7.30 o'clock by a member of the Camera Club.

ASSISTING AVIATION

NEW STATION AT CROYDON.

Among the developments in connection with the new London Air Port at Croydon is an entirely new wireless station. This was erected for the Air Ministry by Marconi's Wireless Telegraph Co., Ltd., to replace the one that has done duty there for the last seven years. The new station consists of a group of four 3-kilowatt wireless transmitters operated in conjunction with a wireless direction finding receiver. The transmitters are capable of telephonic and continuous wave and interrupted continuous wave telegraphic transmission, the wave range being from 600 to 2000 metres. Independent drive circuits maintain constancy of frequency and wave-length. Energy for the transmitters is supplied by a common motor alternator group, the power from which may be switched on to any of the transmitters.

The new wireless direction finding receiver for Croydon, specially designed for this work by the Research Department of the Marconi Company, has remarkably selective characteristics, and incorporates the latest filtering and amplifying devices. It is arranged so that, if required, two or more circuits can be operated on different wave-lengths for the reception of telephony and telegraphy on the same aerials. In order to keep the neighbourhood of the aerodrome as free as possible from obstruction the wireless masts and transmitters are being erected two or three miles from the Air Port and operated by the "remote control" system.

AUSTRALIAN WAVE-LENGTHS

MOOTED ALTERATIONS.

An Australian writer says:—

"The recent Australian Press references to the expressed intention of the Commonwealth Postmaster-General to alter the broadcasting stations' wavelengths suggests a topic for discussion. It is a very important topic, and was frequently mentioned last year by various witnesses before the Royal Commission on Wireless. The unsatisfactory arrangement of the wavelengths operating to-day is a hindrance to the best enjoyment of the services; and it is really surprising that the authorities have not made some simple and very desirable changes before this. Apparently they are now preparing to give us a change—let us hope it will be a reasonable and permanent change.

"Broadcasting in Australia has suffered more than one setback owing to wavelength changes. The first upset in 1923 and 1924 was due perhaps more to the "sealed set" idea of reception than to the wavelength. But then the sealed set scheme was based on particular wavelengths. Later on in 1924 and 1925 those wavelengths, known as the long wavelengths were abandoned. Such wavelengths as 1720 metres and 1100 metres were found to be giving but little satisfaction, and when 3LO changed from 1720 to 371 metres the real boom in broadcasting began.

HOW ARE THE WAVELENGTHS STIPULATED?

"It seemingly never has been clearly shown why the long wavelengths were given to the Australian stations. One suggestion is that the long wavelengths would be better for country reception; but the failure of broadcasting to progress in Western Australia, where the long wavelength of 1250 metres is still in use, does not support that theory. There is room for an interesting discussion of the relative efficiency of long and short wavelengths, but that is not my purpose here.

"The broadcasting companies cannot select their own wavelength: they are given by the Postmaster-General's Department, which is the authority that controls all wireless matters. And as the indiscriminate use of wavelengths would lead to obvious confusion, some such central authority is essential. Apparently the stations now operating were given wavelengths so arranged as to guarantee some degree of freedom from interference by themselves and by stations on ships which communicate with shore stations."

Prince Purachatra, of Siam, has cabled 3LO, Melbourne, that the special short wave programme from that station recently was clearly audible throughout Bangkok. His Royal Highness, who is a keen wireless enthusiast, is establishing a short wave broadcasting station in Siam, and will welcome reports from listeners. The wavelength of his station is not announced.

RADIO ON THE BEACH

AN AUSTRALIAN INNOVATION.

Visitors to Cronulla, a N.S.W. seaside resort, this summer are considerably impressed with an extensive radio and loud-speaker instalment on the public beach, where thousands congregate. The installation comprises four power loudspeakers on different parts of the beach, which can be heard over a radius of a quarter of a mile. The speakers are used for the reception of radio programmes, music, sporting announcements and everything else that is broadcast. Also it is used for announcements by the surf authorities. Such apparatus is specially useful at carnivals. Instructions to bathers are issued from the loudspeakers from an observation point. The installation was provided by the Sutherland Shire Council. An interesting feature is that this radio set is independent of all batteries, deriving its power direct from the electric mains. It is believed to be the first of the kind in Australia, but the utility of such arrangements in the way of entertaining the public, and also in giving any directions that may be necessary is so apparent that it is probable that similar provision will be made on other beaches.

GENERAL MOTORS HOUR

An interesting radio development in the United States is that the powerful motor corporation, General Motors, has inaugurated a weekly programme of one hour's duration on Monday evenings, from 9.30 to 10.30, through 28 different stations, intended to give complete coverage of the United States and Canada. This hour on the air will be known as the "General Motors' Family Party," and special progammes will be sponsored by particular divisions of the General Motors' organisation. It is expected that the plan will increase the good-will of the public to the corporation.

The blue lights which make the towers of 4QG, Brisbane, so conspicuous by night sometimes require a certain amount of attention. Recently some of the lights burned out, and the chief engineer, Mr. F. W. Stevens, climbed to the top of the towers to replace them. He took the old lamps out and while putting in new ones, a globe slipped out of his hand, and crashed to the roof of the building 100 feet below. Mr. Stevens, descending from the tower head, walked across the roof to pick up the pieces. Imagine his surprise when he found the lamp lying quite intact on the concrete roof. It had struck the roof with the base, and beyond a slight dent in the metal portion, was quite unharmed.

NEWS FOR THE CHILDREN

MUSICAL COMPETITION

SUCCESSFUL AT 1YA

The children's "Musical Questions" competition was brought to a close on Saturday, February 18, and the winner was Mabel Turner, of Avondale South, Auckland. The entries were very numerous, though rather less than for the "Do you Know" competition of last month. The winner's answers were right in every instance, and besides that, the paper and the writing were specially neat, and these points also counted in her favour. Master Leonard Kennerley, of New Lynn, was specially commended for his extremely neat paper and his remarkably fine writing. He was wrong in only one answer, otherwise he would have been the winner. A great number of other competitors were highly commended for good papers and neatness. The idea of the competition was that there had been a "Radio" wedding, and the children had to guess, from hearing the tunes played over several times on the air, the bride's name, the groom's name, where they met, etc., etc. It was great fun for everybody, and many were the mistakes made by the little listeners. Here is a list of the questions (16 of them) and the correct answers:—

QUESTIONS.

1. What was his name?
2. What was her name?
3. Where did they meet?
4. What was she wearing?
5. What was he?
6. What was the bridesmaid's name?
7. What was the groomsman's name?
8. What was the bride's bouquet composed of?
9. What did they say of the bride?
10. What did they have for the wedding breakfast?
11. What did they say to the guests after the breakfast?
12. What time did they stop merry-making?
13. What did he say to her when they arrived home?
14. What was the first wedding-present?
15. What did the guests say when leaving?
16. Where did they settle down?

ANSWERS.

1. Barney Google.
2. Polly Wolly Doodle.
3. Way Down Upon the Swannee River.
4. Dem Golden Slippers.
5. The Jolly Miller.
6. Nelly Bly.
7. Tom Tom the Piper's Son.
8. Blue Bells of Scotland.
9. Ain't She Sweet?
10. Cockles and Mussels.
11. Girls and Boys, Come out to Play.
12. Three o'clock in the Morning.
13. Polly, Put the Kettle On.
14. Little Brown Jug.
15. Bye Bye Blackbird.
16. Home Sweet Home.

In announcing the result "Genial Jimmy," who says he will be known in future as "Sunny Jim," complimented the competitors on the general improvement shown in writing and in neatness. In a close contest the winning or losing of the prize, he said, might easily turn on these things.

Happy Birthday Greetings in Verse

Bet and Peggy, girlie twins
With little brother Fred,
Listening in to birthday rhymes
That Uncle Sandy said.

Peg and Betty, here's for you
On this your birthday fair,
In the front-room cupboard find,
Two presents waiting there.

Uncle Sandy's birthday greetings to Betty and Peggy Dagger, of 360 Esplanade, Island Bay.

Children's Sessions for Next Week

AT 2YA.

MONDAY: Toby and Jeff have a diverting hour this week. Pupils of the Queen Margaret College, who have before given "Joy germs" over the air, will again appear. Toby and Jeff have stories and skits for all.

TUESDAY: Uncle Jasper's hour. Following in his train will be a merry party of minstrels—a party arranged by Mrs. Thomas.

THURSDAY: Uncle Sandy and the first appearance of the Wellington Girl Guides. It is hoped that the weather is to be fine for the "Camp fire evening" otherwise we shall have to tuck ourselves away among the bushes and thence tell our "round the fire" yarns.

FRIDAY: Uncle Ernest and the Y.M.C.A. Boy Scouts—"The Jolly Good Cheer" boys let us call them. They'll keep you merry for the hour.

SATURDAY: St. Patrick's Day, Auntie Gwen and Auntie Dot will have the Buckle Street Convent assisting them with choruses appropriate to the occasion.

HAPPY MOMENTS AT 3YA.

MONDAY, 12:—Uncle Jack and Aunt Edna. An hour of delightful songs and stories to brighten the end of a perfect school day.

WEDNESDAY: To-night we have Uncle Peter who tells Brer Rabbit stories so delightfully, and Mother Hubbard who sings such lovely songs for the little folks. A tiny tots' band is to come from the Cathedral Grammar School. Don't forget to listen with all your ears.

THURSDAY: Girls and Boys, here's Chuckle and Aunt Pat again. Recitations and pianoforte items by little cousins.

FRIDAY: Hurrah and three cheers for the Girl Guides. Under the direction of the District Captain we are going to have a camp-fire evening with Big Brother Peterkin and Aunt Pat to read stories and tell jokes and limericks.

SATURDAY: St. Patrick's Day and Aunty May and Uncle Sam are going to be assisted in songs and chorus by members of the Marist choir, while the Convent Ferry Road Orchestra is going to provide orchestral music.

SUNDAY: Children's song service. Uncle Sam and members of Papanui Methodist Sunday School.

AT 4YA.

TUESDAY: Big Brother Bill will have the Moray Place School Drum and Fife Band to help with his programme.

FRIDAY: Willing helpers again this evening for Big Brother Bill—Ray with his violin, Joyce and the piano, Margaret and Fluffy. Mr. Jack Ledgerwood will tell of doings at the boys' camp.

A BRIGHT IDEA

Do you know that it is now possible to actually see just where a wireless message is coming from? A wonderful invention has been thought out by the Radio Research Station, Slough, England, consisting of two frame aerials, which are mounted at right angles to each other. When the signals are received, they are made to operate a cathode, or negative ray beam, which causes a bright spot to appear on a screen of light, showing the actual direction from which the wireless message comes.

LAUGHING BROADCAST

A real live Kookaburra, or Laughing Jackass, has arrived at Melbourne, and his laughter is to be broadcast every Wednesday for a few weeks. His name is Jacko, and he is now four years old, and laughs at the slightest provocation. He evidently sees a joke in everything, and it is very difficult to subdue his infectious laughter. This little fellow has been trained to laugh since he was a tiny baby, and he apparently intends to do his job well.

At his first rehearsal the other day, he did not suffer in the slightest degree from microphone fright. Little Miss Kookaburra happened to be there, and she and "Jacko" rendered perhaps the most novel duet ever produced. The real and mimic laughs blended perfectly, and became a rare laughing competition. When Miss Kookaburra first started her laugh, "Jacko" stopped short, and looked at her in that quaint way, as only a Kookaburra can look. He appeared to wonder what kind of a "bird" Miss Kookaburra was, and then, as though he saw the joke, burst out afresh, laughing and cackling and gurgling and chuckling in sheer abandon with Miss Kookaburra, but "Jacko" laughed last.

WIRELESS IN A WALNUT SHELL

A miniature wireless crystal set, which fits into an ordinary walnut shell, has been made by an English boy of fifteen years. It is quite complete in every way, and works two pairs of headphones at a distance of a mile and a half from the relay station.

A LIMERICK.

The people who live in Siberia,
Of snow become weria and weria;
But a young Eskimo
Just dotes on the snow,
And thinks everything else is inferia.

—E.L.B.

LOOSE-END LIMERICKS

Re-arrange the words in italics to form rhymes:—

A SCHOOLBOY told one of his chums
He thought "maths" much worse than sour *slump.*
Asked what work he liked best
the same fellow *scondsfee.*
He liked nothing better than *muss.*

A SEAFARING fellow of Dover
When asked by a strange cattle-*verrod.*
If he'd voyaged to Calais
Said "Yes, *trallynau,*
I've been over, over and *vreo.*"

A YOUNG lady named May Lulu Huckle
Only laughed when she lost her shoe-*kleeub.*
When her mother said "Don't,"
She replied, "Right, I *tow'n,*
But if I mayn't laugh may a *cleckhu?*"

GROUP OF YOUNG PERFORMERS AT 3YA.
Members of the New Brighton Methodist Church Juvenile Choir, who frequently sing for Uncle Sam at his children's sessions on Sunday evenings.

Ferry Road Convent Boys' Orchestra, which will play during the children's session at 3YA on St. Patrick's Day. Back (left) Earl Keane, L. McMenamin, Neil Smart. Sitting: Lola McMenamin, M. Tobin. Third row: Huia Collins, Colin Smart, Des. Lagan. Front: Reggie Nelson, Albert Henderson. Absent: L. Collins.

A WIRELESS PIANO

A remarkable piano has been installed at the American station WRNY.

It consists of a keyboard of 26 ordinary piano keys. When one of the keys is pressed it switches on a vacuum tube which produces oscillations with a definite musical pitch. Each note of the vacuum tube which it controls is arranged to give a different pitch, so that there is a complete scale of musical notes. As these notes are perfectly pure, and there are no overtones, the music is clearer than that of the flute.

The Pianorad, as it is called, is probably the first of a new type of wireless musical instruments.

THEY MIGHT "CATCH" LIGHT

"I'm going to play a match," says Dad.
Now, tell me where the catch is.
If that's all right for Dad to do
Why mayn't I play with matches?

CONTENTED.

I like the hippopotamus
Because it seldom makes a fuss:
It doesn't long for lots of things
It hasn't got, like bikes, and swings,
And snowballs (here we start to shiver)—

It merely wants a muddy river
Where it can wallow, soak, and roll—
The hippo has a simple soul!

—E.L.R.

THE BEST WAY

Have you ever been to the Land of Nod
By the famous Sleepy Train,
Which runs each night from Here to There,
And brings you back again?

You step aboard when you go to bed
A yawn is the fare, my dear,
And they bring you back without further charge
When you come from There to Here.

WIRELESS IN NEVER NEVER LAND

In the Never Never Land of Australia, as they call the Northern Territory which reaches down through bush and desert to the dun plains of South Australia, a new hospital has just been opened to mitigate the loneliness and the dangers of that great space.

A settler there may have a very happy and prosperous life, but he always lives dangerously because he is so far from his few neighbours in times of trouble. There are no buses from Adelaide or Port Darwin to the homesteads of the Never Never Land's farms; and no railways that are anywhere near. For hundreds of miles there are no signs of civilisation except a single telegraph line.

The wireless, which every day binds the waste and silent places of the earth closer together, is changing all that. At Alice Springs, where the new hospital has been built by the Australian Inland Mission, wireless has been installed. With the hospital's equipment go also the services of motor-cars and an aeroplane, so that now the remote settler in need can call the hospital up by wireless and in a few hours will receive help.

Many a settler, and many a settler's wife, on the hundred-square mile farm, where they wrest a living from the droughty land, will bless the hospital at Alice Springs and think of it as an oasis in the desert.

AN APTLY-NAMED QUARTET

The members of the 3YA vocal quartets, Mrs. Claris Shaw, Miss Mildred Russell, Mr. Gregory Russell, and Mr. W. J. Richards, have decided to name themselves the "Aeolian Quartet." This is a singularly appropriate designation for a quartet singing over the air. The word comes from the ancient Greek, and is derived from "Aeolus," the mythic god of winds. Its actual meaning is "aerial," or the production of the air of winds. Most of us have heard of an Aeolian harp, an instrument consisting of a box on or in which are stretched strings, on which the winds acts to produce the notes.

The Aeolian Quartet have in active rehearsal the whole of the vocal score of that very popular musical comedy "Going up," and this will be put on the air in the near future. Also, this quartet will give listeners-in a programme of that charming operatta, "La Mascotte" very shortly.

HOW WIRELESS WAS BORN

Everything has a beginning somewhere, usually a small one, often so small that no one takes much heed of it. When you turn the knobs of your wireless set to-day to tune in, you are really putting into practical use the laws that a Frenchman named Faraday spent years and years of thought in working out. It was on Christmas Day, 1821, that Faraday discovered that a magnet could be made to move when suspended over a coil of wire through which an electric current was running. Ten years later he produced a piece of apparatus that was the real beginning of all wireless apparatus to-day. He showed how a current could be induced or set flowing in one wire as the current rose and fell in another wire placed near it.

Two of the most important beginnings of wireless were created by Faraday—the inductance and the condenser. His also was the idea of the electric valve, although, of course, he never lived to see one made.

Marconi Discusses the Future of Radio

2YA drew upon an impressive interview with Senatore Guglielmo Marconi, G.C.V.O., D.S.C., from the pen of Frank Parker Stockbridge in the "Saturday Evening Post" for an interesting quarter of an hour recently to fill in the time usually devoted to Imperial affairs. This summary is so excellent that we reprint it for the benefit of those who did not hear or who may wish to review at leisure the views expressed.

THIRTY-TWO years ago I began to experiment in methods of generating, transmitting, and receiving the electrical impulses known as Hertzian waves. The result was what we at first called wireless telegraphy, or simply wireless, which is now known to the whole world as radio.

Since 1901, when I first succeeded in transmitting inteligible signals across the Atlantic, much of the knowledge which we thought we had on the subject has had to be revised and nearly all the methods then in use have been discarded. A few examples will illustrate the changes which have come about, and possibly help to make the present status of radio and its possibilities for the future more clear to the non-technical mind.

Radio transmission, as everybody knows, was formerly much better at night than in the daytime. This has been changed by the most modern methods, so that the exact reverse is now true.

Formerly the radio worked better in the high latitudes; the modern radio is more effectively operated in the tropics.

WIRELESS IN REVERSE GEAR.

Once radio transmission was better over sea than over land; now the most efficient long-distance radio communications, extending halfway around the earth, are chiefly over land, while much shorter distances over sea offer greater obstacles.

In the early stages of development radio transmission over short distances was easier and simpler than at long range; now long-distance transmission is the easier and less expensive.

"Wireless has gone into reverse gear," said an American friend the other day, "and we don't know what it is going back into."

We can tell, however, by the direction in which it is going, the nature of some of its future manifestations if we do not try to look too far ahead. Long-range predictions are always hazardous, especially when they deal with a development so dynamic as that of radio. I have had my share of ridicule for forecasts which I made in the infancy of the art, although I have always tried to be conservative in the role of prophet, and those early predictions have since become realities.

To the younger generation it may sound incredible that general scepticism, on the part of both the scientific world and the general public, greeted my prediction that eventually every ship would be equipped with wireless and that thereby such disasters as the sinking of the French liner Bourgogne, with the loss of almost every soul on board, would be averted. That was ten years before Jack Binns won deserved renown by summoning aid by radio to the sinking Republic, fourteen years before the heroic Phillips went down at his post on board the Titanic, sounding his S.O.S. to the very last. It is a great satisfaction to us who took part in the development of wireless, not so much to have triumphed over that early scepticism as to have provided the means whereby thousands of lives have been saved at sea.

The public mind to-day in respect to radio is the reverse of sceptical. Whereas at first it expected nothing, now the tendency is to expect too much. I would hesitate to say that any of the expected miracles is impossible; that is a word which must be used cautiously in discussing any phase of man's command of the physical forces of Nature. I would simply say that many things which the public is ready to accept as among the possibilities of wireless are not yet within the range of the engineer's mental vision, but I may point out some of the developments to which, I believe, we may confidently look forward before long, which are themselves sufficiently interesting and important for the time being.

NEW USES FOR RADIO.

THE prime use of radio has always been, still is, and is likely to continue to be, as a means of communication between individuals or groups otherwise widely separated. At first this communication was indirect, through the medium of the Morse code—wireless telegraphy. Later it was found that the human voice could be transmitted as well by radio as over a wire, and wireless telephony was developed, establishing a more direct communication. From this discovery sprang broadcasting, whereby the individual communicates simultaneously not with one person alone but with millions.

Broadcasting was the first achievement of radio—if we except communication between ship and shore—which could not be duplicated by the use of wires. Direction finding at sea and in the air, the control of mechanism, and the ignition of explosives at a distance have been proved feasible, as has the transmission of drawings, photographs, and writing in facsimile. In all these functions of radio, development and improvement are constantly going on.

I look forward, moreover, to certain radically new uses of radio. I refer to television and to the transmission of power. Before going further into these possibilities, however, it is necessary to describe the recent advance in the earliest of all applications of radio, the wireless telegraph, for it is upon these developments that the expectations of the future are based.

SHORT STEPS FOR GREAT DISTANCE.

THESE developments consist of, first, the utilisation of short electrical waves, very much shorter than those in general use up to a few months ago, and, second, the adoption of devices in the nature of reflectors, whereby these short waves are transmitted in one principal direction, in a beam which diverges at but a slight angle from the focal point at which the waves are generated. This directed short-wave system—or beam system, as it is also called—is now in service between England and the British Dominions, of Canada, South Africa, Australia, and India, the installations of these services having been made in November, 1926, and March, May, and August, 1927, respectively. In October, 1927, wireless communication between England and the United States was established by the directed short-wave, or beam, system.

By short waves I mean impulses having a wave length of less than 100 metres. Practically all American broadcasting stations use waves of from 200 to more than 600 metres in length; commercial radio telegraph systems for long-distance operations, such as communications between ship and shore or across the sea, use waves of much greater length, up to 3600 metres or more. The tendency until recently has been toward increasing the wave-length in the effort to gain distance.

THIS tendency has been completely reversed. Much greater accuracy, higher speed, and more efficient operation, all at very much lower cost of installation and operation, are now achieved by the use of directed short waves over the longest possible terrestrial distance, which is half way around the earth. Between England and Australia, communications are now conducted on a wave-length of only twenty-six metres—slightly shorter than that, to be accurate. The services to Canada, South Africa, and India use wave-lengths of sixteen and a fraction metres, or between thirty-two and thirty-five metres, the choice being determined by technical considerations. The point is that it has been found that very much shorter waves than were in current practical use a year ago, are now found to give far more satisfactory radio operation over immense distances than long waves give.

The development of the short wave is, in fact, a return to the original experiments of Hertz, upon which all wireless communications are based. Hertz used only short waves in his classical research.

It was not until 1916 that I began to feel that we perhaps had got into a rut, and commenced experiments anew with shortwaves, with the able assistance of my engineering associate, Mr. C. S. Franklin. These experiments were continued until 1922, when I made the first public announcement of our conclusions. Those conclusions, were that very short waves, properly directed, possessed properties which made them superior to long waves in certain respects. It had been believed that the range of the short waves in the day time would be very short; that their night ranges would be variable and subject to long periods of fading and hence unreliable for commercial purposes; and that any considerable stretches of intervening land, especially if mountainous, would greatly reduce the distance over which it might be possible to communicate.

WE discovered that these beliefs were wrong; that the daylight ranges were very much greater than had been anticipated; that the night working was much more reliable than had been believed possible; that fading was not at all serious and that the great strength of the signals received indicated that the night range would probably be much greater than anyone, myself included, had ever before expected. We found, too, that static, even in the tropics, was much less troublesome with the short waves than with the longer waves then universally used for long-distance transmission.

Some remarkable results were achieved in 1923 and 1924 with waves of from ninety-seven metres down. The most important of these was the discovery that the shorter the wave, the longer its range by daylight, but that very short waves had a comparatively short and unreliable range during darkness.

ANOTHER important discovery, already anticipated, was that very small amounts of power sufficed for very long range communication. Without the use of a reflector, messages were sent to Canada, New York, South America and Australia on a thirty-nine metre wavelength with an energy of only twelve kilowatts at the transmitter. To Japan intelligible signals and messages were sent from England with only one-fifth of a kilowatt, or about the power required to light five ordinary incandescent lamps. When it is considered that as high as 1000 kilowatts of power is used for long-wave transmission, the economic saving, if we could make the short waves do the work as well, is apparent.

As a result of these demonstrations, the directional short wave, or beam, system was adopted by the British Government to provide a better and quicker means of communication between the mother country and the dominions than then existed, and a year of experience with the first of these services to be installed—that between England and Canada—has proved highly successful, as also has the briefer experience with the systems operating between Australia, South Africa, India and England. There is no doubt that, through the establishment of the beam system, intercontinental telephone rates will be greatly reduced.

THE operation of the beam system thus far, although it is still subject to further improvement and development, provides a sound basis for conservative forecasts of the future of radio communications.

With the overcoming of the major difficulties in transmission, which has already been accomplished, we shall see radio increasingly used instead of wires in the establishment of telegraph lines in the undeveloped parts of the world. I do not look to see it displace existing telegraph systems—to supplement and extend them perhaps, but in the older civilisations the wire systems will continue to be operated for land lines. But over the great continents of Asia, Africa, and South America, where immense spaces of undeveloped country lie between the settled regions, I think it reasonable to doubt whether wire telegraph lines will ever be constructed. The reliability of the shortwave system already approximates that of the wire, and with the closing in of the angle of reflection, which is rapidly being accomplished, the element of secrecy, the only other advantage which wire systems have over radio, will be approached.

I BELIEVE that in a very short time, perhaps within a year, we shall see a great increase in the speed of transmission of intercontinental messages, as well as a great reduction in their cost.

Twenty-five years ago I predicted, among other things, a telegraph rate of a cent a word between Europe and America. Considering the decline in the purchasing power of the cent, that is not likely now, but I think we are close to realisation of a much lower rate than the lowest now in force. This I expect to see accomplished by the telephotographic, or facsimile, system, which has just emerged from the laboratory stage.

THE facsimile telegraph device transmits at high speed, over the radio waves, an actual picture of a message or document in perfect detail. A message covering a sheet of paper of the size used in a typewriter can be transmitted in a matter of seconds over any distance. Such things have been done in a small way heretofore, but not with the greatest speed or the lowest possible cost. With the general adoption of this method, the Morse code will become obsolete. Telegrams will be charged for by the square inch and there will be no limit to the number of words which may be written on a page. The person addressed will receive an exact facsimile copy of the original, whatever its errors or omissions. This system will lend itself to secret codes based upon the spacing and arrangement of the words; sketches and drawings can be embodied in telegrams at the minimum of cost; lengthy press messages can be forwarded as cheaply as a short private cablegram is now sent.

In the field of broadcasting, the directional shortwave system will be utilised not alone as a telephone system but for actual broadcasting within the angle of reflection. As soon as the projected telephone system is added to the existing beam telegraph system, it will be possible to make a broadcasting hookup by means of which the entire English-speaking world can be brought within the range of one speaker's voice. And on the other hand, by adjusting the reflector to take in a predetermined angle, broadcasting can be limited to a particular sector of the map.

A LITTLE farther in the future, but perhaps much closer than we now realise—certainly not very far off—will come television. We are very close to the commercial application of laboratory experiments which have proved successful in America and Europe in transmitting actual scenes by radio. This is something quite different from the projection of a picture; it is the projection over a distance of actual objects in motion. I see no obstacle save the economic one to its extension over any possible terrestial range.

Once television is made available, it will be possible for people in Calcutta, say, actually to watch the running of the Derby, Chicago, San Francisco and the rest of the world can look on while heavyweight boxers contend for the fistic championship. Not only the spectators in the Yale Bowl but the whole world can see the classics of the gridiron. The coronation of a king, the inauguration of a president, every great spectacle and pageant can and will, I believe, be made visible to all who care to see them, wherever they may be.

Like flying, television has been one of humanity's dreams from the beginning of time. We have realised flight; we are about to realise this other cherished ambition.

I DO not imagine that the application of television—in its earlier stages, at least—will take the precise form which some of the depicters of Utopia have described. It is not likely to be possible, for a very long time at any rate, to sit by one's own fireside and tune in one's private television receiver to watch a horse race or a prize fight as one now listens to its description over the home radio receiver.

NEW MOVIES.

THAT may be done by a few men of wealth, but I am afraid that the cost of an adequate receiving installation will be too great for the private means of most. It will be not only possible, however, but commercially practical in every way for theatres to throw these actual pictures of current happenings upon the screen, just as they now show motion pictures of them long after the event; and this may be done at an admission fee little if any more than now charged.

This may not seem at first impact to offer anything greatly different from the present news reels, but there is an important psychological difference. The spectator to-day, viewing the motion picture of a past event, knows beforehand, through the newspapers, from listening to its description broadcast by radio, just how it came out, which horse, which boxer, which team won. With television, the spectator in the theatre, 1000 miles or half the world away from the actual scene, will see it as news, as a contest the outcome of which is still in doubt. He will have all the thrill and suspense for which people travel long distances and spend large amounts.

I LOOK for great development of the use of the radio beam for direction finding at sea and in the air. The radio is already in successful use for this purpose, and there has been and is now going on an extensive application of it as a guide to flyers. It will simplify navigation greatly when a ship can traverse any given great circle route under the constant guidance of a radio beam; the aberrations of the magnetic compass and the necessity for solar observations will both be done away with.

I anticipate great development also in the control of mechanism from a distance by means of directed short waves. By the control of mechanism at a distance I do not mean the transmission of the actual motive power of the mechanism, but merely the opening or closing, under the influence of the radio beam, of electrical circuits which serve to start or stop the machinery. Nobody has as yet transmitted actual power by radio, but I trust I may not be regarded as too visionary when I say that that, too, is among the future possibilities of radio.

EVERY LITTLE BIT ADDED.

WE still have much to learn about radio. We cannot to-day even name with certainty the medium through which the electrical waves are transmitted; it is no longer fashionable in scientific circles to speak of the "ether," and we are forced to fall back upon the vague expression "space." Though we have gone a long way toward overcoming the handicap of static, there is still a long road ahead to travel in that direction. We know that all electric impulses are affected directly or indirectly by the sun, but just why and how we are not sure. Sun spots and magnetic storms, the aurora borealis and other phenomena of Nature, not yet fully understood, affect the wireless just as they also affect the cables and the land telegraph lines. The mysterious phenomenon known as fading has not yet been satisfactorily explained.

TO no one man belongs the credit for what has already been achieved by radio; thousands of scientists and engineers, professional and amateur, have contributed to the development of the art to its present stage. Thousands of others are constantly at work trying to solve the problems which remain unsolved, to discover new methods, new applications, more economical and more efficient apparatus. From the laboratory of any of these workers there may emerge, without warning, something so radically new as to set all our present calculations at naught. For that reason no one has a right to say that anything which might conceivably be accomplished by radio is impossible.

WHAT has been accomplished is the extension of our somewhat limited human senses. To-day we hear and speak to one another halfway around the world; to-morrow we shall see one another through mountains and across oceans.

Here is a new means of communication, unlimited in its scope and possibilities, against which no frontiers can form a barrier to the most precious of all human privileges—the free and unrestricted exchange of ideas. And that, I maintain, is the only force to which we can look with any degree of hope for the ultimate establishment of permanent world peace.

PARALYSED VALVES

CAUSE EXPLAINED

PRESENT-DAY valves, for the most part, have so-called thoriated tungsten filaments, the action of which, even at this late date, is not fully appreciated by the average listener.

The electronic emission of the thoriated tungsten filament depends upon the presence of a layer of thorium atoms on the outer surface of the filament. It will be noted that, unlike the oxide-coated filament found in some valves, the thoriated tungsten filament is not merely thorium-coated, but it is permeated throughout its entire mass with the rare element thorium.

During Normal Operation.

During the normal operation of such a filament the thorium on the outer surface is gradually evaporated, reducing the emission current, and, if permitted to continue, rendering the valve short-lived. However, while the heat of the filament serves to evaporate the thorium particles on the surface, it is also boiling fresh thorium particles out of the mass and up to the surface. Thus the surface is being continually replenished. Just so long as the filament voltage is not increased beyond 10 per cent. above the rated value, this evaporation and replenishing process continues at an equilibrium rate, so that a constant layer of thorium is maintained on the surface.

Valve Becomes Paralysed.

When subjected to an over-voltage on the filament, however, the evaporation becomes excessive, so that the valve accordingly becomes more or less paralysed. Operating these valves at sub-normal voltages is also liable to paralyse them slowly, as the filament temperature is then so low that the process of boiling out the thorium from the interior of the filament becomes abnormally retarded. Hence it is important that the thoriated tungsten filament valves be operated strictly at their rated voltage, by means of hand rheostats with an accurate voltmeter, or, better still and simpler, by means of amperites, the self-adjusting rheostats.

WRNY'S SHORT-WAVE

SCHEDULE OF TRANSMISSIONS.

Since WRNY's short-wave transmitter at Coytesville, New Jersey, went on the air recently (says the New York "Radio News"), many listeners have inquired for information concerning the station's operating schedule and its exact transmitting wavelength. For the benefit of these correspondents and other radio fans possessing short-wave receivers, the following information has been prepared by the WRNY operating staff.

The programmes of WRNY, originating in studios in the Hotel Roosevelt, New York, are broadcast on 30.9 metres (9700 kilocycles), at the same time that they are radiated on the station's regular broadcast wave, 326 metres (920 kilocycles).

CALL SIGN 2XAL.

The short-wave transmitter has been asigned the call letters 2XAL. The full operating schedule is as follows all hours are Eastern Standard Time, five hours earlier than Greenwich Time):

Tuesday, 7 p.m. till midnight.
Wednesday, 4 to 9 p.m.
Friday, 7 to 11 p.m.
Saturday, 7 to 10 p.m.
Sunday, 4 to 6 p.m.

The signals of the WRNY short-wave transmitter have already been reported in all parts of the United States, many parts of Canada, in practically all the countries of Europe, and in Australia. Listeners hearing the station are requested to send report cards to the WRNY offices in the Hotel Roosevelt, New York City.

Printed and published for the New Zealand Radio Publishing Company, at the registered office, Dominion Avenue, Wellington, of the Wellington Publishing Company, by Archibald Sando, of 47 Freyberg Street, Lyall Bay, FRIDAY, MARCH 9, 1928.