e.f. When "R" is the resistance, "e" is the e.m.f. dropped and "i" the current passing.

3. When neutralising s.g. and ordinary r.f. valves is it correct to tune out a signal when the filament is disconnected and the reaction off?

A.: Note quite. In the first place you do not neutralise a screen-grid valve and secondly, when you are using a set employing reaction, neutralising is done as was described recently in the "Ranger Three" article.

L.D.M. (Feilding): I have a modified Pierce earth system employing five wires leading directly from the terminal of a lightning arrester. Would it be a better proposition to run one wire from the arrester and branch down near the pipe?

A.: There is very little difference in the efficiency of both these earths; probably the first is the better; you have a lower resistance between the lightning arrester and the pipes than when you use the longer single wire.

FIVE VALVE (St. Albans): Would I get a better bass reproduction if I use a baffle on my speaker?

A.: Yes, a baffle would tend to bring out the bass notes, but your speaker is not particularly adapted for use with a baffle. However, if you could manage to fit behind one, so much the better. The bass notes are not always due to the speaker alone. They, to a very large extent, depend upon the amplifier used in the set.

A.J.B. (Waikino): Would two variable condensers of.00016 capacity with two .0002 fixed condensers in parallel do for the "Kestrel Three"?

A.: No; they would be more or less satisfactory without the parallel condenser for the short-wave but, if you use the parallel condenser for broadcast you would find that the band would not adequately be covered. You see you still have a residual capacity of .0002, whereas, if the condenser were acting normally you would have less than .00005. This of course, prevents you covering the band.

DX22.N.W. (Tasman.): What would the aerial sketched out be like? It runs from the top of a cliff about 200 feet high down to the beach?

A.: The aerial would be quite satisfactory. It might be better however, if you could get another mast up on top of the cliff and have your aerial running in its entirety along the top. It will be interesting to get this other aerial up and then compare them.

2.: The gauge of wire enclosed will be quite satisfactory for wiring your house. It is about 18 d.c.c. If, however, you want to move speakers about it would be safer to use an output filter at the set itself, and then you could use fine wire for taking the leads round the house; 24 or 26 gauge would not be too fine.

3.: Is a set harmed when turned on without the speaker connected up, and if the speaker and phones are on the first jack, does it mean that the second audio is not using any current?

A.: It does not harm the set to have it operating without a speaker. It all depends how your set is wired whether the last valve is cut out when you use the first stage jack. In most outfits, the first jack cuts out the last valve. If your circuit is the popular kit set type, then it will be cut out when the first stage is used. Your other point will be answered in the "Diagnosis of Radio."

DX2A (Auckland): Drop a note to the Technical Engineer, "Radio Ltd.," Anzac Avenue, Auckland. He will probably supply you with the circuit for which you ask.

VOLTAGE (Hawke's Bay): What will be the best combination of valves to use in my five valve American battery receiver?

A.: Use four 221's and B605 in the last stage. If you use 605 in the last stage it must be suitably biased. Make quite certain that you have provision on your set for a "C" battery. If there is not, then it will be in your interest to have one put in. It is only a small job.

ROGER (S. Canterbury): What adaption should be made to the "Knife Edge Rejector" described in the 1931 "Guide" in order to discriminate between 4YA and KFI?

A.: Those two stations are on frequencies very close to one another, and it is doubtful if you can get them cleanly separated even with a wave-trap. Your best plan would be to make up the "Knife Edge Rejector," but using formodensers in both places instead of the fixed condenser recommended. The formodenser, which costs about 2/6, can be adjusted to suit any capacity required. It is not possible to use a wave-trap for more than one station, unless something more elaborate is made, such as the dual wave-trap described a few weeks back. Selectivity can often be improved by inserting a fixed condenser of .0002 or .0003 in series with the aerial.

AJAX (Roslyn): American stations can be picked up usually between 4.30 and 7.30 p.m. For more particulars see this month's "Radio Log."

J.P. (Gisborne): I have recently constructed an electric set, but cannot get it to operate when I use an aerial inside an iron shed. If I disconnect the earth and connect the shed to the aerial terminal, I get more or less satisfactory results, but the stations are somewhat weak.

A.: This is quite understandable. The fact that you are using an aerial inside an iron building and not getting results is due to the iron building shielding the aerial and carrying the radio waves to earth. When you connect the iron shed to the aerial terminal, it now acts as an aerial. You can often get very good results by conecting the ground wire to the aerial terminal and leaving off the ground. In fact we prognosticate that, within a very short time, the new sets will be doing this, so abolishing the outdoor aerial. If you erected a good outdoor aerial and installed a good earth, probably your troubles would disappear.

R.S.D. (Palmerston North): I have an a.c. receiver about 2½ years old and am using four 226 valves, one 171 and a 227. Is this a good combination?

A.: It is as good as your set will allow. You could not use a different combination of valves. It is preferable, however, to have them all of the same make.

2. The earth wire is about 4 feet long, connected to a galvanised iron pipe driven 2ft. 6in. in the ground. Is this satisfactory?

A.: Yes. It may be improved by sinking your pipe a little farther in the earth and keeping it moist. Earths were very fully discussed in an article published about 12 months ago.

BEGINNER (Auckland): I have just erected an aerial 30 feet high with the poles 50 feet apart. I find that I get no better results from the aerial than from a coil of wire alongside the set. I get slightly better results by using the earth wire.

A.: Obviously there is something wrong with your aerial installation. If you are using a lightning arrester in the set, take it out, and then try it. If your aerial is on pulleys, let it down and check up on the insulators, to make quite certain that there is not any leakage to earth. Have you checked over all joints to see that the wires come into electrical contact with one another? Many people, in erecting an aerial, forget to scrape the enamel from the two wires they are joining.

NOVICE (Takapuna): I wish to replace the valves in my set. It is at present using 226's in all stages except the detector, rectifier, and last audio. I see that these are out of date. Are there any others that I can use?

A.: We are afraid not. Your set is designed for the 226 type of valve, and you must use these in all stages except the detector and last. We advise you to replace them, as you have had the set some time. Try first the rectifier and see if that makes any difference. If not, replace them all.

J.W.B. (——): I am using a four-valve Browning Drake and have re-neutralised it for a PM5X, which I find more sensitive, but I cannot stabilise it below 3YA. Should I remove turns on the primary coil?

A. PM5X is quite a suitable valve for the Browning Drake. Generally speaking the number of turns is the same as for the 199. Try a 2 mfds. by-pass condenser between the bottom of the primary coil and the earth. Place the condenser as near the coil as possible. It may be wise to use an r.f. choke between the point where the condenser joins the "B plus" r.f. lead and the "B" battery. This failing, you may slightly reduce the number of turns on the primary coil, as this always has the effect of making the set more stable.

2. Is it possible to switch out the r.f. valve from the panel to avoid taking it out? I have a separate rheostat for it. If so, what would be the connections to the push-pull switch?

A. If the rheostat will not cut the valve out of the circuit (a rheostat can usually act as an off-on switch as well), take one of the connections from the rheostat and connect instead to the push-pull switch. Connect the other side of the push-pull switch to the rheostat.

N.Z. 107W (Wellington): Would you supply the correct number of turns for .0005 condensers with .0002 differential condensers, to be wound on a valve base?

ANSWER TO COME ::::::

2. Should a set squeal on the point of oscillation?

A. If there is a station there it will howl when it is doing this. If there is no station there the trouble is known as fringe howl. It is very annoying and makes tuning difficult. From the sketch of your layout we think that a lot of the trouble is being caused by your having a two-circuit jack on the front panel and also through taking leads from the .0001 condenser used in series with the tuning condenser on to the panel. Stray capacity is always likely to be caused by long leads, particularly with the double-circuit jack. The use of these is not at all wise unless arranged as Mr. Sellens has done in his shortwaver. Even then the leads must be kept very short. Is the "C" battery apart from the set itself? If so, then you have a long straggling lead from the grid return. Bring the grid bias battery into the set itself and so shorten the grid circuit. The use of a ½ mfd. condenser across the "C" battery may possibly help, but the best plan is to bring this battery right into the set.

3. Could you furnish working instructions for building a moving coil loudspeaker?

A.: These were published in the "Radio Record" some years ago, but unless you are very lucky you will not be able to get a copy. If you call at our office and ask to see the file copy, it is possible you will be able to jot down particulars sufficient for you to be able to make up the speaker.

FOXY (Wellington).: I have a commercially-made a.c. receiver. What valves should I replace my present ones with when they are done?

A.: We cannot tell you, as you have not stated what make your receiver is. With a.c. valves there is very little chance of variation. You must replace the valves with precisely the same type, though you may select a different make. For instance, if you are using 226 type valves, then you must replace your present ones with these, though you can use any of the several makes there are on the market. However, keep to the better-known makes, as it is not wise to use just anything in the way of valves.

2. What would be the cost of having headphones attached to my set?

A. Very little. If you did the job yourself—and the instructions were given very clearly in the "Radio Record" a little time back—the cost would be less than 10s. However, phones would not enable you to reach out much farther. What you cannot hear on the speaker with an a.c. set, you rarely hear on the phones. Atmospheres and set noises usually manage to drown out weak signals.

IMPOT. (Rangiora).: My set has dead spots over the larger portion of the dials. Could you tell me the cause and remedy?

A. Dead spots over the greater part of your dials, in a set such as the Browning Drake, are caused usually through a defective valve or through the condenser vanes touching. Examine your radio frequency and detector condensers very carefully, turning the vanes in and out through their whole circuit. Watch carefully to see that the vanes do not touch at any place.

2. What type of Philips valves can be used with 135 volts "B" and 6 volts "A" for a four-valve Browning Drake?

A.: 1st radio A609, detector A615, audio A609, power valve B605. The last valve must be biased by 12 volts.

ANZAC (Christchurch): I have recently replaced the valves in my set and for the first time have heard three American stations faintly. Is this district bad for reception?

A.: Some good logs have been put up in and about Christchurch, but as localities even adjacent vary greatly it is impossible to say if you are getting good results. It seems as though, for the type of set you are using, you are not doing at all badly.

2. Our one pole is 40 feet high with an 80-feet aerial direct to the set. The earth consists of a 9-feet iron pipe sunk into shingle. There is an entire absence of soil. Can we improve our installation in any way?

A.: Yes; erect another pole. It is not a good practice to have one mast and bring the aerial from that directly down to the set. If you had another mast 40 feet high, then brought a lead in from that to the set, your results would be very much improved. Furthermore, where you have shingle it is impossible to get a really good earth unless you go to some trouble by earthing an old copper or by driving several pipes into the ground six feet apart. Dress the surface near where the pipes are buried with salt and keep well watered.

3. Our set has blown two condensers in the last eighteen months. Is there a fault somewhere?

A.: Yes. The condensers are not of a high enough break-down voltage. It sometimes happens that the original condensers in the set break down, but if higher test condensers are put back in the set the trouble should not re-occur.

S.W. Broadcast for N.Z.

I HAVE just received a letter from a South American station, El Prado, which contains the following advice:—"We are pleased to advise you that we will transmit a special programme dedicated to our New Zealand listeners on Saturday, October 3, from 11 p.m. to 1 a.m., E.S.T. This will be on Sunday from about 4-6 p.m. N.Z. time. El Prado will operate on a wavelength of 39.80 m. We presume that you will receive this letter in ample time to notify all radio fans in advance, and we hope to be repaid by a good number of reports on this transmission. Announcements will all be made in Spanish and English. Address all communications to: El Prado, Apartado 98, Riobamba, Ecuador." I also received a letter from Mr. Payne, the engineer of W3XL, to whom I wrote some time ago for information concerning W9XAA. He writes as follows: "Relative to your inquiry regarding W9XAA. To the best of my knowledge this station operates on a wavelength of 25.34 m., and relays station WCFL's presentations irregularly."—A. P. Morrison (Wellington).