

WAVE TRAPS AND WAYS OF REDUCING INTERFERENCE

LECTURE BY MR. E. W. MAHONEY AT IYA

The sensitivity of the set, emphasis-
ed Mr. Mahoney, had a great deal to
do with the selectivity. If we have two
receivers which have equal selectivity,
but the one receiver is much more
sensitive than the other, the more sen-
sitive one may seem to be broader
than the other, but if the volume con-
trol is adjusted that the volume output
of the two sets is the same, the ability
to separate the stations may be the
same for both sets. Again, if you have
a very sensitive receiver, and are located
in a place where the air is crowded
with stations, you are not only likely
to experience interference between
locals, but you will also encounter het-
erodyne whistles from distant stations
in the background. This is impossible
to remedy in the set itself. The only
possible way of this trouble being
eliminated is for the interfering stations
to have a new wave-length allotted to
them.

Any or all of the following ideas and
methods may be tried out by those in-
terested, and eventually you may be
able to find a special method that
suits your receiver best, when it can be
adopted as a permanent feature for
your set. It must be clearly under-
stood, however, that wave traps, etc.,
are not suitable for sets under the four-
valve type and are really best when
used with a more powerful set. The
reason is that when you install a trap
of any type whatsoever, or use a re-
sistance in the circuit, a decrease of
total amount of volume, that is ob-
tainable from the set under ordinary
circumstances, is inevitable, and for
that reason it is more advisable to try
and use the following methods on
smaller sets.

The first method is:—Follow out the
wiring of the set and find out if the
radio filaments are grounded, that is,
connected to the ground connection,
either by a wire soldered in place or by
terminating the grid returns at the
tuning condensers, whose rotor, or
moving plates, are grounded to a metal
panel. In many cases if this wire is
removed an increase in selectivity will
be experienced. It may be found in
some receivers, however, that this will
materially decrease sensitivity, or in
regenerative sets, may allow the re-
ceiver to oscillate, in which case it
would not do to eliminate this connec-
tion. You must use your own judg-
ment in adopting the circuit that will
suit your needs.

Second Method.—Although not now
extensively used and amongst the
newer radio enthusiasts hardly known,
a variometer can be used quite suc-
cessfully to tune the aerial circuit.
Nearly all receivers now use the tuned
primary circuit; that is, the ap-
tenna circuit has no variable element
in its makeup, but consists only of
the antenna and ground and between
them a fixed coil called the primary.
Now the relative action between these
two is as follows:—Radio high fre-
quency currents flowing through the
aerial circuit are induced or attracted
by the fixed primary coil, although
these coils are not touching one an-
other. This is really a rough idea of
the action between the aerial circuit
and the primary, a longer description
not now being desirable. Now to get
back to the variometer. Where it is
possible to use this type of circuit,
it will be found to give not only ad-
ded selectivity, but sensitivity, the
reason for this being that supposing
you are using a set with two condens-
ers of four or less, the method of tun-
ing is always the same. You tune the
secondary circuit until you have the
maximum amount of current flowing
through the receiver. Now it does not
seem possible to increase the maxi-
mum amount of current in face of
this, but it is quite possible, by using
the variometer, to tune the aerial,
when an added gain in volume is pos-
sible and a larger degree of selectivity
is also possible. If you are using the
secondary method of tuning in your
set, the aerial is untuned, or, in other
words, simply acts as a piece of wire
to pick up the high frequency cur-
rents that may be sent out by the sta-
tion. Now by tuning this aerial it is
possible to make it respond to any
wave-length, and to that one alone. So
you can quite easily see that where
the variometer is used it is quite pos-
sible to make it respond to any wave-
length and to that one alone. So you
can quite easily see that where the
variometer is used it is quite possible
to gain selectivity and sensitivity.

Of course, it must be understood
that any method of reducing interfer-
ence or using a wave trap means an
added control to the set except where
a fixed condenser is used. This meth-
od will be described later on. An-
other means of tuning the aerial cir-
cuit is to use a variable condenser
connected in the ground lead, but
with this must be used a loading coil
in the aerial circuit. The number of
turns of this coil is roughly about the
same as the secondary coils in your
receiver, but it is quite simple to wind
a coil of the solenoid type and just
take a few turns until you find the
best number. At least you should
start off with 60 turns, and if you
find that is too many just reduce the
number of turns by taking off about
three or four at a time. It will take
a little time to determine the correct
number, as it will depend on the type
of receiver you are using and the
capacity of your aerial. If you are
not particularly interested in making
your set very sensitive and merely
wish to add a little selectivity to it,
you will find that if you install a fixed
condenser of 0.0025mf in series with
the ground lead, this will help to
make your set more selective. A
condenser of less capacity may be

found even better, again depending
on the type of receiver, etc.

In connection with oscillating sets
Mr. Mahoney said it is a very hard
task, and a very thankless one, to al-
ways be talking about the one thing
all the time; but evidently, at last,
public opinion is taking shape, and
many of you are beginning to look on
this type of pest the same way as I
am doing, and that is, he must be
eliminated if we wish for the best re-
ception possible. It is bad enough to
have to endure the interference of
static and fading, with consequent dis-
tortions, whilst listening to a station,
without having in addition the con-
tinual howling and squalling of these
parasites of the radio ether. The
Post and Telegraph Department has
tried to assist by forwarding to all
listeners a copy of a stage of neutral-
ised high frequency to be installed
before the detector, and also other cir-
cuits and advice, and the sum total
of this kindly forbearance on the part
of the Department has been nil. They
delight in making the concert that you
are listening to a hideous nightmare
of growls, howls, and shrieks. They
do not receive the station, and ap-
parently do not intend to let anyone
else hear it and enjoy the programme.

There is only one method with these
disturbers of our radio programmes,
and that is to ban them thoroughly
and completely by compelling them to
use a stage of neutralised radio fre-
quency. The time is past for talking
kindly to them and trying to show
them how it should be done. They
must be, as I said before, compelled
to cease from making what should be
an enjoyment into nothing less than a
hideous row. I myself have never
heard 2YA, Wellington, with satisfac-
tion yet, there always being some
howlers doing their best to turn music
and musical items into a series of cat
calls and pig grunts. My advice to
these so-called ether hogs is, shut up
or leave radio alone, and have a lit-
tle thought for those who wish to en-
joy a programme, and can do so, ex-
cept for the efforts of these dear, kind,
thoughtful squawkers.

TESTING OSCILLATION

Many people believe that no interfer-
ence can be caused unless howls and
squeaks are audible in the headset or
the loudspeaker. It should be realised
that howling is an audio-frequency
noise due to oscillation of the most vi-
olent type. Interference can be, and in
most cases is, caused long before the
set reaches this stage. When even mild
oscillation is present energy is trans-
ferred from the set to the aerial; the re-
ceiver thus becomes for the time being
a weak transmitter sending out waves
of small amplitude. As these have usu-
ally a frequency very near to that of
the transmission being received they
heterodyne it and may set up in other
receivers in the neighbourhood a low
continuous note which utterly spoils re-
ception. If the heterodyne produces a
beat that is either above or below audio
frequency no note will be heard, but
receiving sets in the vicinity will be af-
fected. Often there will be a tendency
on their part to oscillate and certainly
reception will be blurred and distorted.
The unmistakable signs of oscillation in
one's own set are these: As adjustments
are made, the received signal grows
very loud, and is accompanied by rush-
ing or rustling noises; C.W. signals
may be heard faintly if any are in pro-
gress on the same wave-length; any
tendency that the set naturally has to
noisiness becomes exaggerated—thus if
faint cracklings are heard normally they
will become very loud and may assume
proportions of atmospherics when oscil-
lation is present.

But there is one absolutely certain
test for the presence of oscillation. This
consists in touching the aerial terminal
of the set with a wet finger. If there
is no oscillation the result will be to
cause signals to fall off, since by touch-
ing the terminal the aerial is earthed to
some extent; but there will not be
anything like a sharp click in the re-
ceivers as the finger makes and breaks
contact. This click is certain proof
that the set is in oscillation and that it
is radiating. Interference produced
when the set is in this condition will
not, of course, be so bad as that which
occurs when it actually howls, still its
effects are fairly powerful, and they af-
fect other receivers at a considerable
distance. During some experiments,
carried out some time ago in conjunc-
tion with a friend who is also an enthu-
siast, it was found that if a microphone
was inserted into the earth lead of a set
oscillating just sufficiently to cause the
clicks referred to telephonic transmis-
sions could be made to a distance of
at least half a mile. All amateurs then
who are engaged upon broadcast recep-
tion, whether from home stations or
from those overseas, should make this
test frequently, and should do every-
thing in their power to avoid giving
rise to interference by allowing their
sets to oscillate even mildly.

Another misconception which is fair-
ly widespread is that interference can
not be caused unless reaction is used.
Nothing could be further from the truth.
A set employing tuned anode or tuned
transformer coupling oscillates very
readily unless the grid potentials are
properly controlled and is capable of re-
radiating even though the reaction ter-
minals are short circuited and the coil
removed altogether. Those who use cir-
cuits of this type therefore should be
particularly on the look out for oscilla-
tion, and should not allow themselves
to be lulled into a false feeling of secu-
rity.

The Children's Corner

By "ARIEL"

DEAR BOYS AND GIRLS,—

We are getting on famously with our "Priceless Wireless Zoo,"
are we not? How do you like our "Smiler"? I think he makes
an admirable second animal, and the prize is carried off by Alma
Chamberlain, Riccarton, this time. I am going to make the closing
date for No. 3, the criticising "Krytik," just a week later, just to
give you a little more time to get in before closing date. Last week
such a lot of "Howlers" arrived after the door was shut, so we will
have an extension till August 31. I think you are all splendid with
your drawings, and when our Zoo is complete, I am going to mount
them all to hang in a row on the wall over my desk.

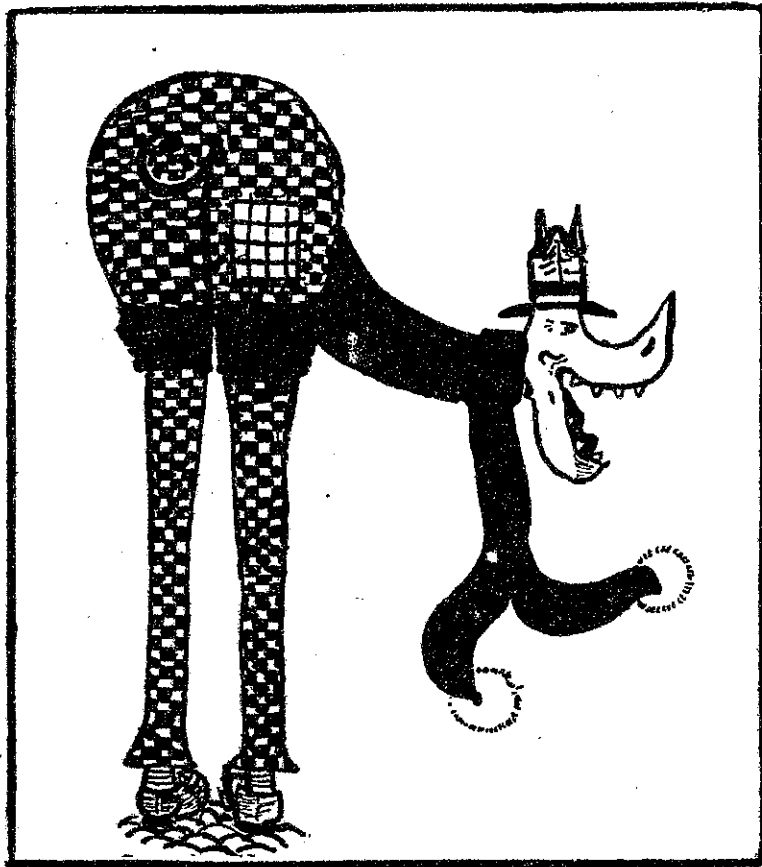
For No. 4 shall we have a "Faydout"? He is a gentle, ghost-
like creature, very timid and "trembly." He never talks aloud—he
only whispers and sighs. There's no accounting for him—he just comes
and goes, and, being so timid, there's no chance of getting hold of him.
Have him ready with his verse by September 14—plenty of time to get
bright ideas!

My family has grown so large in such a short time that I am
beginning to feel like the old woman who lived in a shoe. You manage
to keep me very busy, but so long as you are happy I wouldn't have it
otherwise.

Now, get to work again without delay—there's quite a lot to be
done!—Your loving, ARIEL.

OUR WIRELESS ZOO—No. 2, THE SMILER

Here we have the second inmate for our Zoo. Isn't he a dear?
The prize this week goes to Miss Alma Chamberlain, 25 Rata Street,
Riccarton, Christchurch.



"THE SMILER."

If you have a holiday and nothing else to do,
There's a peculiar beastie I must introduce to you;
He is called the "Wireless Smiler," and is very, very nice,
We really couldn't sell him—no, not at any price!
He smiles and laughs and giggles—Oh! he's such a funny thing!
The only thing that he can't do is talk to you—or sing. . . .
So if you have a holiday, I'll introduce to you
The guileless "Wireless Smiler" at our priceless Wireless Zoo.
—Alma Chamberlain, Riccarton.

OUR LETTERS

Geoffrey Cole, Nelson.—Both your
drawings were good, but not quite
the right kind for our Zoo. I have
taken one of your verses, though. Try
again for the Krytik for August 31.
Thank you for your "Sing a Song of
Sixpence."

J. Jordan, Christchurch.—Thank you
very much for the limericks last week.
Were they all original?

Betty Levy, Wellington.—Have an-
other try, Betty! It was very good
for such a little girl.

Suzanne Riddiford, Havelock North.—
Yours was certainly a dear little
"Smiler," but he didn't have any mouth
or eyes! What a pity! Thank you
for the verse.

Naneye McNie, Wellington.—Why did
you paint your "Smiler," dear? She
would have been better uncoloured, I
expect you have read the rules by now,
so have another try. Thank you, too,
for the verse.

Ronald Satten, Invercargill.—He
really was a beauty, and ever so nicely
drawn. I think you must have put a
lot of work into him, but, you see, he
had no verse, so he couldn't win a
prize. Write a verse next time, even
if it's only a few lines.

"Crystal," Christchurch.—Thank you
for your "Percy" poem. When you
next write, please let me have your
real name instead of a nom de plume.

M. Carter, Hastings.—Draw your ani-
mal on a separate sheet of paper next
time, and do him in ink if possible.

Mervyn Jillings, Hastings.—You were
another of the "verseless" ones! All
our animals have to have a little poem,
too, and I think you could make up a
tiny one if you tried. It isn't so very
difficult. I am so glad you like draw-
ing and painting—the result of the
"Pokkit and Pykk" painting will be out
next week. Will you draw a "Krytik"
for me by August 31?

J. A. Crawley, Dunedin.—I think you
attempted a little too much—just a
simple animal after the style of the
prize-winner would have been better.
Your poem should have had twelve
lines instead of thirteen, but I admire
your beautifully neat writing. Send in

a letter for the competition and just
see how successful you may be!
Elma Clapham, Papatoetoe.—Thank
you for your dear little letter. Yes,
you must have a wonderful time with
your five-valve set. I am so pleased to
know that you have such a good opinion
of our "Corner"! Of course, we couldn't
possibly forget you!

SOME SMILER VERSES.

I love the smiler just like this—
He thinks the world is full of bliss;
He looks at me and seems to say,
"Why sit here moping all the day?
If you'll come with me and play
A game will chase all care away."
—Geoffrey Cole, Nelson.

The smiler is cheery and happy
And never inclined to be snappy;
He will smile
All the while,
And help others to smile—
He's really a dear little chappie.
Suzanne Riddiford, Hawke's Bay.

Smile and the world smiles with you,
Grouch and you grouch alone.
If you wear a cheerful grin
They will always let you in
Where the "groucher" is never
known.
—Naneye McNie, Wellington.

COMPETITIONS

1. Our Wireless Zoo—Drawing and
verse:
"Krytik," closing date August 31
(prize 5s.).
"Faydout," closing date September
14 (prize 5s.).
2. Letter: "What I Like Best About
Broadcasting." Closing date August
24 (prize 5s.).
3. Painting: Closing dates August 24
and August 31 (prize for each—a book).

RULES FOR COMPETITIONS.

1. Draw on smooth surface paper and
use Indian ink, when possible.
2. Write on one side of the paper
only.
3. Attach name, address, and age to
each entry.
4. Use watercolours for painting.
5. Address all entries to "Ariel," P.O.
Box 1039, Wellington, and post early.

PUZZLES AND TEASERS

Here are a few little puzzles—quite
easy ones, but they may amuse you.
In the first one, a number of English
towns are described in separate syl-
lables. For instance: No. 1 is Oxford—
an animal, ox, and a shallow stream,
ford. The others are much the same.
See if you can puzzle them out.

1. An animal. A shallow stream.—
Oxford.
2. A colour in a letter of the alphabet.
3. Another word for trot. What your
dog does with his bones.
4. A number of trees.
5. A stately bird. The ocean.
6. Another word for "modern." A
Spanish wine.
7. Old fashioned word for people. A
hard substance.
8. A popular game, also the name of
a school.
9. A term of endearment. Twenty
cwts.
10. A colour. What hayricks do
when set alight.

SING A SONG OF SIXPENCE

Sing a song of sixpence,
A pocket full of shot.
Four and twenty blackbirds—
I shot the lot.
They were stealing cherries,
We wanted for a pie,
So I took my little gun
And "popped" them on the sly.
(Original) —Geoffrey Cole.

"I THOUGHT I SAW—"

A JOLLY PENCIL-AND-PAPER GAME FOR WINTER EVENINGS.

Are you fond of playing pencil-and-
paper games? One of the best of all
these is writing little, simple verses, all
of which have to begin in the same way.
You can have lots of fun at this game.

Each player is given a piece of paper,
on which he is to write a line begin-
ning, "I thought I saw," and add a
word of three syllables, such as:—

"I thought I saw an omnibus."
The paper is then folded, and passed
to the next player, who writes the next
line, without knowing what the first
one is. Perhaps he will write, "Eating
pickled ham." When he has written
his original line, he has to add, "I
looked again and saw it was," fold the
paper and pass it on. The third player,
who, of course, has no idea what the
first lines are like (except that he has
to rhyme with "ham"), does the last
line.

Perhaps he will write, "An airship
on a tram," or "A pot of raspberry
jam," or anything else ending in "am."
The completed "poem" will read as
follows:—

"I thought I saw an omnibus,
Eating pickled ham.
I looked again and saw it was
An airship on a tram."

In playing this game, you must al-
ways remember that two lines are al-
ways the same, "I thought I saw," and
"I looked again and saw it was." The
player who writes the second line—
"Eating pickled ham"—must write his
last word—"ham"—on the paper when
he folds it over, so that the last player
can see what the rhyme is.

With a company of smart players this
game can be most amusing; and the ab-
surd verses, when read out, will cause
roars of laughter.

ANSWERS

TREX-MENDOUS RIDDLES.

1. Date.
2. Palm.
3. Gum.
4. Beech (beach).
5. Pear (pair).
6. Plane (plain).
7. Ash.

THE MISSING E's.

Were there ever perfect men, ye
clever clergymen, tell me when?

PERTINENT PERCY

Percy made a "one-lung" set,
And he, Sydney, tried to get—
Put such cat-calls on the air,
Others chuckled in despair.
Meetings soon were quickly called—
Result, poor Percy badly "mauled."
So he's satisfied to-day
To tune in for 3YA.
—"Crystal," Christchurch.

BILLY'S GERM

Billy had a little germ,
It's look was hardly pleasant,
And everywhere that Billy went
That germ was surely present.

It got into a scratch one day,
And tried to turn it septic,
But Billy got some iodine
And now that germ's dyspeptic.

Yesterday now is a part of for ever—
Bound up in a shcaf, which God
holds tight,
With glad days and sad days and bad
days which never
Shall visit us more with their
bloom and their blight,
Their fulness of sunshine or sorrow-
ful night.
—Susan Coolidge.

In a court at Bradford, England, re-
cently, an aggrieved broadcast listener
who had threatened to knife his next-
door neighbour for maintaining an os-
cillating set was bound over to keep
the peace for six months.