

The Children's Corner

By "ARIEL"

DEAR RADIO CHILDREN,—

What a difficult task you set me this week to select a prize-winning picture from several hundred paintings. Such a lot of them were beautifully done, too. Mervyn Jillings, Hastings, heads the list for all-round merit. He is only eight years old, and I am very proud of his success among so many older competitors. The prize for the writing competition goes to C. C. Meikle, Nelson. Nearly all the letter-writers were boys. What happened to my Radio-girls? Surely they are not going to let the boys have things all their own way, are they?

I am glad you all take such a keen interest in broadcasting and appreciate the fact that you live in a very wonderful age. Those of you who make your own sets will perhaps be interested to know that in the Science Museum at South Kensington, London, is a funny-looking collection of coils of wire and scraps of metal, and other apparatus, stuck together with sealing-wax, which looks as if it would be dear at five shillings! This is the very first wireless set ever made, and I'm sure you would all love to have a look at it. It was put together before any of the bits could be bought at a shop, and a good deal of it is hand made. The man who made it was a humble electrician from Wales, named David Hughes, and he also made the very first microphone.

And to think that it was twenty long years before anyone else in the whole world believed in wireless! All this happened about fifty years ago, and the story of how David Hughes tried to convince the great scientists of the day, in vain, is too long to tell you now. You see, ideas sometimes float around in the world of thought till they find an entrance into the right man's mind; and often when they have found a home, that particular man has not the power to convince other great minds of the wonderful discovery he has made. So with David Hughes—he had not the power of expression, and often called things by their wrong names; so, of course, found it impossible to make other people understand him.

Anyway, he lived to see wireless waves growing to recognition and usefulness under Marconi, and I expect that made up to him for his earlier disappointment. Quite a lot of notable work has been done by experimenters who make their own tools and instruments as they go along, so who knows what new discoveries any one of you may make when tinkering with your radio sets!

Next week will see our third Zoo animal, the "Krytik." Some children tell me they don't know what he is, so I'll tell you again. A critic criticises, doesn't he? He is a fault-finding, poke-a-hole-in-everything-kind-of-person beast. Now, do you know how he looks? A "Paydout" is a pale, feeble, ghost-like creature. You must all know what he is like, because he so often puts in an appearance when we are listening-in to our favourite music—it just fades out! In case any of you are going to find these a bit difficult to draw, we will have some really easy ones to follow.

All Wellington radio children will be delighted to hear Uncle Ernest once more at bed-time story hour. I think he will be a new Uncle for the much wider circle made possible by 2YA's high power. Love—ARIEL.

COMPETITION RESULTS

Our competitions are becoming very, very popular—competitors are full of enthusiasm. Here are the results of the two closing on August 24—Ariel.

PAINTING COMPETITION.

POKKIT AND PYKK.
Prize Winner—Mervyn Jillings, 8 years, 416 Brunswick St., Hastings, H.B.

VERY HIGHLY COMMENDED.
Daisy Gallacher, Linwood, Christchurch.

N. Yelland, Birkenhead, Auckland.
Phyllis Ball, Epsom, Auckland.
Peggy Wheatley, Westport.
Irene Flemming, Hāitai, Wellington.

Roxie Abbe, Aramoho.
Florence Olifent, Kelburn.
May Spicer, Carterton.
Zelda Clayton, Gisborne.

Peggy MacKenzie, Queenstown.
Dorothy Tovey, Howick, Auckland.
Rav Andersen, Collingwood, Nelson.
S. L. Holmes, Pendafton, Christchurch.

K. Minsen, Opawa, Christchurch.
Kathleen Nicholson, Remuera, Auckland.
Sidney Hough, Linwood, Christchurch.

HIGHLY COMMENDED.

Allan McNab, Mt. Albert, Auckland;
Norma Strange, Grey Lynn, Auckland;
Nora Fulton, Frankton; Joyce Holland Napier; Jean James, Papakura; Hugh Taylor Opawa, Christchurch; Torry Lamb, Timaru; W. Jameson, Pendafton, Christchurch; Marion Every, Carterton; Edna Hill, Khandallah; Irene Shaw, Remuera, Auckland; Dorothy Walker, Herne Bay, Auckland; Betty Baker, Karori, Wellington; Mary van Asch, Havelock North; Richard Oden, Te Puke, Bay of Plenty; Nola Jordan, Palmerston North; Peggy Bull, Opawa, Christchurch; Jean Collins, Taneatua, Bay of Plenty; Elizabeth Marshall, Takapuna, Auckland; Truda Bayliss, Gisborne; Kathleen Evans, Reefton; Alma Evans, Manukau Harbour; John Jerratt, Epsom, Auckland; Betty Blow, Rongotai; Ronald Caughy, Epsom, Auckland; Newton Cramer, Onehunga; Ngaire Moss, St. Albans, Christchurch; Hilda Purdie, Parnell, Auckland; Marion Marks, St. Clair, Dunedin; Suzanne Riddiford, Havelock North; Doris Golding, Wadestown Road, Wellington; George Schnell, Eketahuna; Mary McLeod, Mt. Eden, Auckland; Douglas E. McEwan, Edeandale South; B. Westall, Lyttelton; Reginald Hancock, Clevedon; Dulcie McIlhin, Takapuna; Cicely Clifton-Mogg, Christchurch.

LETTER COMPETITION

"WHAT I LIKE BEST ABOUT BROADCASTING."

Prize Winner.

C. C. Meikle (12 years), 113 Collingwood Street, Nelson.

What I like best about broadcasting is the making of one's own apparatus, and the honest pride of "getting in" a distant station. This I can do by studiously reading notes by "Megohm" on the construction of wireless parts, and to him I can always refer for information on any detail. His articles on the construction of different kinds of sets are very interesting and instructive for enthusiastic beginners in their new hobby.

I am very interested in the mystery of wireless. To think that the waves from the Sydney town clock have been rippling at our own doors for years unknown and undetected by us, and what other messages may be floating in the boundless ether only waiting for us to detect them.

As the various types of sets are improved, more and more wonders will be opened up before us, for wireless is still in its infancy. By making my own sets I shall, no doubt, learn the principles of wireless and render



MASTER RAY ARNOLD.

Ray Arnold is only twelve years old, but is a very clever little violinist, and gives promise of becoming a great player. He has, on two occasions, taken part in Aunt Diana's concerts at 4YA, and is going to play very soon at an evening concert with grown-up artists. All radio children will be on the look-out for his name in the programmes.

good service in finding and fixing defects in my own and other people's sets.

As the years go past, fading, valves, batteries and all antennae systems will gradually disappear, only to be remembered by the grey-beards of the last generation.

C. C. MEIKLE, Nelson.

Other Views.

These are taken from other competitors' letters. I thought you might be interested to know what other girls and boys like best.

I like your page very much, especially the competitions. The winning drawing of the "Howler" was very good.

At night after tea we go into our sittingroom, where our wireless set is, and tune in the New Zealand stations, and sometimes the Australian ones. The best part of the programme is always the children's session, especially when it's Uncle Jack's turn at 3YA.

After the children's session I like a band or orchestra to play. When there are ukuleles and guitars in the orchestra the music is very nice.

Next to these I like to listen to an account of the market reports, even though I don't understand much of the things said.

Then, unless the programme is to be very good, I go to bed.—Bruce Brock, Hanterville.

Likes the Music.

I am just writing to tell you the thing I like best about the broadcasting; it is the violin and string instruments. The fun I get out of it is to see our dog sit down and toss his head to one side, and it does not matter what you say to him, he will not shift. Another reason why I like the violin is because I think the music is so sweet. My father has also promised to give me a violin if I get my proficiency certificate at the end of the year, and so you may be sure I am working very hard at school. I often wonder when there will be a children's hour from 2YA, because I like the stories, especially the ones from Christchurch.—Frank Willis, Vogeltown.

Can Answer Back Safely.

My father has a five-valve set, and he gets the "Radio Record" every week. I look forward for it now, as I read the Children's Corner. The part I like best is the Children's Session, as I don't sit up late. I have written to all the Aunts and Uncles in New Zealand. Dad and I have great fun listening to the children's stories, as we can answer them back without them hearing us. I think it is good fun trying to get new stations. I am glad that 2YA is getting a Children's Session. Best wishes.—Bruce Jones, Dunedin.

Wonders of Wireless.

For my part, I think, perhaps, of all the wonderful inventions we have in this beautiful old world of ours, wireless comes first on the list. What I like best of all about broadcasting is, firstly, the unselfish nature of the announcer, in giving such enjoyable programmes over the air, and, secondly, the immense comfort one obtains on such boisterous nights as we are at present having. Wireless appeals to me as the most wonderful invention. In this small township of Aratapu, finding no other amusements but pictures, of which one soon tires, I find wireless the most pleasing entertainer I have ever experienced. I have had the pleasure of hearing Dame Nellie Melba sing from Melbourne. I may not have had the advantage of ever hearing this wonderful singer if not for the wireless. I do not think broadcasting is nearly so beneficial to town people as to the weary farmers after a hard day's toiling, because in town one has so very many amusements from which to choose. We owe a great deal to Marconi, the inventor of this great entertainer. Indeed, many homes, hospitals, and out-of-the-way towns would seem lost without this great boon. Our grandmothers and grandfathers, too, who are too feeble to go out, appreciate this power of broadcasting greatly. I cannot help but think of the time and trouble to which the announcers put themselves

for the benefit of others, and hope that we listeners remember that it is very hard to please everybody, and so take and make the best of what others so generously give.—Freda Hempself, Aratapu, North Wairoa.

ANSWERS TO HIDDEN TOWNS

1. OXFORD.
2. READING (red in g).
3. CANTERBURY.
4. SEVENOAKS.
5. SWANSEA.
6. NEWPORT.
7. FOLEYSTONE.
8. RUGBY.
9. DARLINGTON.
10. BLACKBURN.

STRANGE CONTRADICTIONS

I'm strange contradictions; I'm new and I'm old,
I'm often in tatters, and oft decked with gold.
I'm always in black, and I'm always in white,
I'm grave and I'm gay, I am heavy and light,
In form too I differ—I'm thick and I'm thin;
I've no flesh and no bone, yet I'm covered in skin;
Often die soon, though I sometimes live ages,
And no monarch alive has so many pages.
What am I? Answer next week.

MORE JUMBLED NAMES

These are names of well known poets. See if you can straighten them out.

1. NRYNOSTN.
2. LEWLNOCOF.
3. GRINWORN.
4. SIDODAN.
5. BTASK.
6. DFFLRGOC.
7. LOTN.
8. YHIESLL.

Answers next week.

A NEW COMPETITION

Can any one write parodies? Here is one on contrary Marv—not very good one, certainly!

Mary, Mary, quite contrary,
How is your radio set?
Frisco and Sydney, and Paris, we hear—
Have you got London yet?

I think you could turn out something better than that if you tried. Send them in by September 7. If we get some very good ones we might get one of the uncles to recite them over the air—would that be nice?

THINGS THAT CANNOT BE DONE

You can't weigh grams with a grammar,
And you can't cure hams with a hammer,
Do suns with a summer,
Stew plums with a plumber,
Or shear an old ram with a rammer.

A PAINFUL ENDING.

You never hear the bee complain,
Or hear it weep or wail;
But if it likes it can unfold
A very painful tail.

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alone. If he is advised to get a "so-and-so," he should insist on hearing it before he places his order—and after hearing it, it would not be a bad plan to hear some others before finally choosing. Many and varied are the tastes of listeners as regards the tonal quality of broadcast music. Some prefer the higher frequencies to be predominant, others don't mind what they have, so long as they get volume, while still more are dissatisfied if the low notes of the bassoon and organ are in any way cut off, and do not mind losing a few of the higher harmonics. A very few really study the problem, and demand real tonal purity, and these have to get it themselves, as a rule, by suiting the set to the loudspeaker, and vice-versa.

Another point that may escape the listener is that concerning the impedance or resistance of the loudspeaker. This may seem a small matter, but if tonal purity is to be obtained it is really essential that the resistance of the loudspeaker be suited to the impedance of the output from the set, which latter depends upon several factors, such as the anode impedance of the valve used, and so on. Roughly speaking, if the resistance of the loudspeaker is about a quarter of that of the impedance of the output, the set should be capable of giving reasonably pure results. The resistance of a loudspeaker is usually somewhere about a quarter of its impedance, so that a "2000 ohm" loudspeaker has an impedance of about 6000 or 8000 ohms. This is a very rough calculation, and is only very approximately correct, but for the average power valve having about 6000 ohms impedance, the 2000 ohm loudspeaker should be most suitable.

The Hornless Type.

Loud-speakers having only 120 ohms resistance will necessitate the use of a telephone transformer, that is, a transformer with a ratio of 10:1, or thereabouts, will have to be inserted between the output to the set and the input of the loudspeaker in such a

way that a step down in voltage (and corresponding step up in current) is obtained. This is often useful where the loudspeaker is to be used on extension leads, though it is not necessary, as the well-known choke system of feeding the loudspeaker, and thereby isolating it for all except the required L.P. impulses, is quite efficient, and enables long leads to be employed without danger of H.T. leakage or howling, due to capacity leaks between the plate circuit of the last valve and earth.

Finally, the intending purchaser should remember that the hornless loudspeaker, as a rule, appears to give less volume than its earlier brother with the sound conduit, and this is often due, not to insensitivity, but to the fact that the sound is dispensed in all directions, and not led out in one definite direction. The golden rule for success in choosing a loudspeaker is to insist on a demonstration, and not to choose before hearing, not only of the one you fancy, but also several others.

More care should be exercised in the choice of a hornless loudspeaker, especially if it is of the cone type, because blemishes in the way of high or low note suppression due to the set itself may be seriously pronounced when the loudspeaker is coupled to the set.

Extreme care should therefore be taken by the purchaser, whatever loudspeaker he "has his eye on," and it cannot be too much emphasised that he should insist on a demonstration under conditions as nearly like his own as possible, and not choose a loudspeaker solely for its beauty of line, or because the firm that advertises it is "sure to turn out a good one."

If there are children around it is advisable to use a single throw switch connected in series with one of the A battery leads to the set. It should be located high enough on the wall, or in some concealed spot, to prevent the oldest child from reaching it easily. When not using the set throw the switch off.

WHY DO CRYSTALS RECTIFY?

A FEW THEORIES.

Crystals have now been used for the rectification of wireless signals for about twenty years, but it is curious to note that, long before being put to this use, the crystal had been carefully investigated by scientists as a one-way conductor of electrical impulses of high frequency. Despite these facts, the present-day crystal investigator is almost as much in the dark as to how rectification takes place as was his predecessor of pre-wireless days.

Since the introduction of the crystal as a radio rectifier, it has been found to possess other remarkable characteristics which are in every sense quite as mysterious in their nature as its rectifying properties. Besides being able to rectify H.F. currents, there are a number of crystals which are now known to be able to generate oscillations when they are connected in suitable circuits, and, in addition, several varieties of crystalline minerals have recently been shown to possess the extraordinary property of converting light rays into electrical impulses. Other strange and unusual characteristics which are possessed by some varieties of crystals show themselves in the effects of "pyro" and "piezo" electricity. That is to say, crystals possessing these properties are able to generate electrical currents in their interiors when they are either heated or subjected to varying amounts of pressure. Yet here, again, practically nothing is known about the causes of these effects. One can only surmise certain probable actions which might account for the effects.

Theories which have been advanced in connection with crystal rectification may be divided into four distinct classes, as follows:—

1. Theories assigning the cause of crystal rectification to abnormalities

in the electrical conductivities of the materials

2. Electro-chemical theories.
3. Thermal theories.
4. Molecular theories.

Probably the most popular and well-known theories at the present time are those which can be included in the first division. In 1907 Professor Pierce found that a carborundum crystal rectifier appeared to disobey Ohm's law entirely. For instance, with a local potential of two volts applied to it, the crystal passed approximately 35-40 times as much current in the one direction as it did in the other; and, furthermore, it was subsequently discovered that, as the locally-applied potential was increased, the one-way conductivity of the crystal also increased quite out of all proportion. Thus, with a local potential of 30 volts, the carborundum crystal passed 3000 times as much current in the one direction as it did in the other. At the same period other scientists were making discoveries of other crystals with rectifying properties when used in contact with a suitable metal.

One electro-chemical theory assumes that there is present in the surface films at the point of crystal contact a quantity of absorbed air or gas, and it is owing to the peculiarities in the conductivity of this surface layer that the rectifying effect of the crystal is set up.

The best known thermal theory has it that when the oscillatory current passes across the crystal contact a certain amount of heat is produced, giving rise to further minute currents of a unidirectional nature, and it is these currents that flow from the crystal into the headphones of the set.

None of these theories makes the slightest attempt to explain the practically very important fact that many crystals decrease in sensitivity after continued use. Nor do the theories offer any explanation as to why one crystal may be entirely satisfactory in sensitive properties, whilst another crystal of an identical composition and form may be utterly useless for

use in a broadcast crystal receiver.

By floating fine crystal dust on the surface of mercury, and applying a fine cat's-whisker to a particle of the dust, good rectification has been obtained, proving that conditions necessary for rectification must be present in the surface layers of the crystal, and not within its mass.

It appears likely that the true explanation of crystal rectification will be based upon the surface molecular theory, although it has not yet explained how the rectification is produced. Nevertheless, the holders of the theory appear to be making praiseworthy attempts to account for well-known properties of the crystal, which the exponents of the older conception of crystal action almost entirely ignored.

DOUBLE GRID VALVES

Hugo Gernsback, editor of the New York "Radio News," comments:—"While Europe has been generally conceded to be behind American radio progress, it is, nevertheless, a rather singular fact that one vast improvement in radio, the double grid valve, is not only not produced in this country, but is hardly known here. There is no denying the fact that the double grid valve is a great improvement over the American single grid valve. This valve is in great demand, and is very popular in Europe, yet in America the only few samples that are in existence are all imported. Why there should be such a situation has always been a cause of wonderment, and we hope it will be rectified speedily."

Just ruins good radio, when it collects on the sockets and other apparatus in a receiver. Sets that originally worked well, but which gradually lose volume and distance range, oftentimes are caused by a gradual collection of dust which affords a good leakage path from one terminal to another on a socket, coil or condenser. Keep your set in a cabinet and even then frequently dust off the interior. It pays.