

THE PRODUCTION OF DIATHERMY CURRENTS

water or gas pipe, is bad. I do not say that you will not get satisfactory results with it while you are using it for reception purposes, especially for long waves, but for short wave work (anything much below 300 metres), I feel quite certain that with very few exceptions if you are upstairs or above ground level it will be very much better to use a Lodge counter capacity.

A question was asked with regard to the energy of the two waves that we saw set up in the experiment. I did not quite get the meaning. What virtually happens is this: the closed circuit drives the secondary circuit and the frequency of the latter is higher than its natural period. Now, inasmuch as you get the energy from the closed circuit, we should expect to get fairly strong oscillations on the higher frequency. Now, when the secondary circuit is in turn putting energy back into the closed circuit, it is oscillating at a lower frequency, and at the same time the energy is very rapidly damped out because of the absorption of the closed circuit. That is what we noticed on the arrangement of the circuit shown. I cannot see quite how it can be otherwise. Of course you must remember that in this secondary circuit you have got a hot wire ammeter that has a resistance of 7 ohms., so that a good deal of the secondary energy will not get back to the primary closed circuit.

Mr. Phillips mentioned the subject of the aerial I fully endorse his remarks with regard to the tacking of an aerial lead-in to the wall.

Another little point which wants a certain amount of attention is the free end of the aerial. It is not a good practice to bring that free end up to a building. The mast does not very much matter, because its actual capacity is very small unless you have a lot of stay wires up, but generally speaking it is a good plan to leave several feet between the free end of the aerial and its support. I think that is also a point for short-wave work.

As to the question of valves *versus* spark and spark *versus* valves, I was rather hoping that perhaps at some very near date we might have another lecture on this subject dealing with the question of C.W. I certainly do not think the subject is one that the Society ought to drop for some time to come, as it is a most important one, and when I was asked to come and discourse on this subject I felt that at any rate the proper thing to do was to go back a little and start with some of the older work and leave it to others, with more experience perhaps, to unfold their up-to-date knowledge on other matters such as reception and more modern C.W. transmission. I think that is all, and thank you very much for your attention.

Short Wave Signals from America

AS stated in our last issue, the Transatlantic Tests, organised by the American Radio Relay League, have caused great interest in America among members of the League. Their decision to send Mr. Paul F. Godley over here as their representative to ensure that the signals be picked up if it is at all possible to get them, is only further evidence of their determination to make the Tests successful.

It is generally believed in America that British amateurs have not suitable equipment for picking up their signals.

In pre-war days when we were limited entirely to short wavelengths, British radio amateurs carried out quite good radio work, but since at the present time we have the licences for 1,000 metres as well as 180 metres, most of us use the longer wavelength. The result of this is in the main that few of us have had much experience in the reception of short wavelength signals, using modern amplifying apparatus. In designing and handling valve circuits, almost as much depends upon working experience as upon the type of equipment used. In this respect the American Amateur is better prepared to receive short wave signals than the average British radio experimenter. Whether or no this receiving equipment will prove better than ours remains to be seen.

Mr. Godley arrived at Southampton in the early hours of Tuesday morning, November 22nd, and after the necessary customs formalities with regard to his wireless gear proceeded to London

to discuss the arrangements made for him, and his proposed programme of operations. At the time of writing, he is now engaged upon preliminary tests to investigate receiving conditions on this side of the Atlantic, before finally deciding upon the location to be adopted for his receiving station.

In the main, the equipment that he will use consists of a standard amateur "Regenerative" receiver and amplifier, and an Armstrong Super-sonic heterodyne apparatus. While of course the latter has greater amplifying qualities, his great aim is to pick up the signals using as nearly standard American amateur equipment as possible—that is, a regenerative receiver with two or three valves.

A word may be added here as to the differences between the usual American and British equipments used by amateurs. In America, receivers of the "Regenerative" type are the most common, either used as single valve receivers, or in conjunction with one or two stages of low frequency amplification (note magnification). The term "Regenerative" receiver indicates an apparatus in which means are provided for "regenerating" the signals, *i.e.*, the incoming signals are amplified by the valve, and the magnified oscillations are fed back again into the grid circuit, so that the valve tends to generate continuous oscillations. A similar effect is of course obtained in ordinary reaction valve circuits—or autodyne circuits—as commonly used in this country. In the American apparatus the plate circuit of the valve is tuned

to the wavelength of the incoming signals, usually by means of a variometer, the feed-back to the grid circuit occurring generally by reason of the inter-electrode capacity of the valve, and by stray capacities or magnetic couplings between the grid and plate circuits.

Such a tuned plate circuit gives the maximum amplification that it is possible to secure with a single valve, since the plate circuit under these conditions offers a very high effective resistance to currents of the frequency to which it is tuned. Similar effects are, of course, also obtained with ordinary tuned plate circuits in which the tuning is effected by means of a variable condenser across a fixed inductance, but since the effective resistance of a parallel resonance circuit of this type is proportional to the ratio of the inductance to the capacity of the circuit, the effective resistance of a variometer tuned circuit should be somewhat higher than when a variable condenser is used. The amplification given by the valve will, therefore, also be slightly higher, but not much so if the tuning condenser in the other type is kept small.

Control of the oscillating state of the valve in a regenerative receiver is effected mainly by varying the tuning of the plate circuit since the retroactive coupling is constant.

The principles of the Armstrong super-heterodyne circuits have already been described in these columns*, and the reader is referred to that description for further details.

Attention may also be drawn to a speech made by Mr. Godley at the meeting of the Wireless Society of London, held on Wednesday, November 23rd, in which he outlined the work of the American Relay League, and his views about amateur wireless work in this and his own country. A report of the speech will be found on pages 574—576 of this issue.

P. R. C.

* See *Wireless World*, November 13th, 1920, pp. 581—583.

Changes in French Time Signals

Since November 15th important changes have taken place in the time signals transmitted by the various French stations. Lyons (YN) now transmits rhythmic scientific signals (beats) at 0800; the international signals from Paris (FL) and beats formerly transmitted at 0955 and 1030 have been advanced by half an hour; the two series of beats transmitted by Paris (FL) at 2110 and at 2300 have been replaced by a single transmission at 2200; the non-musical beats at 2330, the only regular service which was still being sent from the old spark transmitter of the Eiffel Tower, has been suppressed; the French signals from Paris (FL) formerly transmitted at 2345 have been advanced by one hour. The only transmissions remaining unchanged are the French signals from Lyons (YN) at 0900, and from Paris (FL) at 1045, and the beats from Bordeaux (LY) at 2000. The following is a table of these changes:

0800 Lyons	(YN)	15,500 C.W.	Rhythmic scientific signals.
0900 Lyons	(YN)	15,500 C.W.	French time signals.
0925 Paris	(FL)	2,600 spark	International time signals.

1000 Paris	(FL)	2,600 spark	Rhythmic scientific signals.
1045 Paris	(FL)	2,600 spark	French time signals.
2000 Bordeaux	(LY)	23,450 C.W.	Rhythmic scientific signals.
2200 Paris	(FL)	2,600 spark	Rhythmic scientific signals.
2245 Paris	(FL)	2,600 spark	French time signals.

The times of the first and three hundredth beats of the scientific signals are now given in Sidereal Time instead of Greenwich Mean Time.

For each series of beats transmitted by Lyons, Paris or Bordeaux, the times of the first and of the three hundredth beat are sent before the following signals from the same transmitter: the time of the beats from Lyons (YN) at 0800 before its French time signals at 0900. Those of the beats from Paris (FL) at 1000 before its French time signals of 1045. Those of the beats from Paris (FL) at 2200 before its French time signals of 2245. Bordeaux (LY) having only one transmission of time signals a day, the times of its beats of each day are sent before its scientific rhythmic signals of the next day. Other details remain as prior to November 15th.

Our Questions & Answers Section

OUR readers will notice that, with this issue *The Wireless World* adopts a different style of printing from that to which we have hitherto been accustomed. The reason for this reduction in size of type is our inability to do justice to some sections of the Magazine owing to lack of space. The section which has contributed primarily to the necessity for this change is the Question and Answers Section.

Recently we have re-introduced the practice, which was suspended for some time, of including the questions with the answers given. Space again was the factor which necessitated the omission of the questions.

In pointing out these things, we do so with the assurance that any suggestions we make which will simplify our work and tend to speed up the publication of replies to questions, will receive the ready co-operation of our readers.

Our suggestions, then, are as follows:—

(1) That questions that can be answered through elementary wireless text books, which should be in the possession of every wireless experimenter, should not be referred to this section.

(2) That readers should not take advantage of the offer that four questions will be dealt with at a time, except in cases of necessity. It sometimes appears that a reader wishes to have one serious question answered, and adds to this two or more questions of little importance.

(3) That each separate question should be set out on a separate sheet of paper, and on one side of the paper only.

If readers will give attention to these little points we feel confident that it will be possible to add greatly to the value of this service by dealing more promptly with questions sent in.