

be heard. Zeesen started at 6.35 a.m. at R8. They were gushy, but a little better than PCJ.

SW could not be heard up till 7.30 a.m. W2XAF when first tuned in at 2 p.m. were R8, with rapid fading. Dance music was heard later from the Rainbow Room of the New Kenmore Hotel, Albany, New York. PCJ were R3 at 2 p.m., increasing to R8-9 by 5 p.m. Reception was spoilt by mush.

On 33 metres at 2.15 p.m. duplex talk was heard at R4. NRH, Costa Rica, was R3 at 2.30 p.m., but were very rough. At 2.50 p.m. some foreign talk and English was heard, including the call NRH. This was followed by an orchestral item at R6. The station went off at 3 p.m. without any further announcement.

W9XF was R2-3 at 3.30 p.m., increasing to R7-8 by 5.27 p.m., when they signed off. W3XAL, from R3 at 3.30 p.m. to R6 at 4.30 p.m., were heard with their "Slumber Hour" music. Another station was heard between 9XF and 3XAL, but too weak to be readable.

GBX and 2ME, at 5.30 p.m., were both at good strength handling post office duplex telephony. KIXR was very weak and rough at 10 p.m. RA97 were R9 at 10 p.m. and R3 on their first harmonic.

Unidentified.

41.6 metres (about), Tuesday, Wednesday, Friday, and Saturday.

35.3 metres (about), Thursday.

33 metres (about), Saturday.

32 metres (about), Monday and Wednesday.

26.7 metres (about), Wednesday.

Reception during the week has been very poor with most stations, clarity being spoilt on many stations by mushiness.

Siam on Short-wave.

FOLLOWING is a report I received from Siam.—S. Conner (Wellington).

I have the honour to acknowledge with many thanks the receipt of your letter dated January 13, 1930, regarding our broadcast transmissions from HS2PJ. The information which you have given me thereon is quite valuable, as our pre-

FOR SALE OR EXCHANGE

The rate for small advertisements under this heading is 1/6 cash for 20 words, and twopenny for every other word thereafter.

FOR SALE.—Short-Wave Set, four valves, screen grid; 3 Willard B Batteries, Wet, 6000 MA; 1 Willard Accumulator, 6-volts; 1 Balkite Trickle Charger, 110 to 230 volts; 1 Willard B Charger; first-class order, received European and American stations on loud-speaker. 30 Ascot Street, Wellington.

"A.B.C." ELIMINATORS, with Westinghouse Rectifiers, make Battery Radio superior to most A.C. Radios. Quotations gladly given. Johns, Ltd., Chancery Street, Auckland.

RADIO Catalogue sent on request—Electric and Battery Radios, Speakers, Batteries, Valves, Motors, Pick-ups, etc. Royds-Howard Co., 553 Colombo Street, Christchurch.

MYSTERIOUS Pocket Lighter. What makes it light? 4/6. Two posted with Spark Pencil, 10/-. Agents wanted. Royds-Howard Co., Colombo Street, Christchurch.

Fading Might be Overcome Interesting Experiments Meet with Success

(By James H. Waiter)

FADING, one of the greatest bugbears in the path of long-distance reception, has long occupied the attention of experimenters, both amateur and professional, but until now the progress that has been made is negligible. Interesting particulars of extensive experiments just concluded on both sides of the Atlantic, however, definitely reveal that fading can be overcome, and will shortly, it is hoped, be a relic of the past.

Data and information harvested during the past few years, formed the basis of the tests which were performed by the Philips organisation. A special programme was broadcast to the United States from shortwave station PHI at Huizen on a wavelength of 16.88 metres. The N.B.C. network re-broadcast the programme throughout the whole of America, being picked up in Europe by special apparatus at Eindhoven, and then passed on to the broadcasting transmitters at Huizen and Brussels by land-line.

Surprisingly good results were obtained at the laboratories, and fading was entirely absent, but the quality of reproduction from the long-wave transmitters at Brussels and Huizen suffered owing to the length of telephone cable connecting them to the laboratories, and the distortion introduced by the number of repeating installations necessary. Nevertheless the relayed programme proved to be by far the most enjoyable yet received in Europe from America.

THREE directional aerials of the so-called dipole type were erected at the laboratories under the direction of Dr. Balith v. d. Pol, who had predetermined their construction to suit exactly the wavelength of the transmitter to be received. The object in using three aerials at a certain distance from one another was to compensate for the fading effect, for it has been found that fading in various places does not occur simultaneously. That is to say, that whereas fading will be experienced by one aerial, another in close proximity will escape. Each aerial

sent transmission is purely experimental, pending the completion of our permanent broadcasting station. Please find enclosed details of present station. —Yours, etc., Phra Oram, radio engineer.

Schedule of Transmissions.

CALL-SIGN, HS2PJ, wavelength 29.5 metres, power 500 watts, hours of operation, Sundays, from 13.00 to 16.00 G.M.T. The call-sign of the long-wave station is HS11PJ, wavelength 300 metres (1000 kc.), power 300 watts, hours of operation, Wednesdays, 13.00 to 16.00 G.M.T.

Announcements are in three languages, Siamese, English, and French.

was connected to an independent receiver, but the output of all three was combined. It was immediately noticeable that there was considerably less fading, than when only one aerial was used.

In order to avoid parasitic noises, which might be caused by electrical machinery operating in the neighbourhood, the receivers were placed in a cottage in an open space a few miles from the laboratories. The receiving apparatus consisted of ordinary commercial sets which had been altered to function on the super-autodyne principle. Their most noteworthy feature consisted of an automatic anti-fading device, the basic principle of which may be defined as follows:—

THE output of the last intermediate frequency amplifying valve of the receiving set is partly utilised to supply after amplification negative grid bias for the I.F. amplifying valves. The value of this negative grid bias, which also determines the I.F. amplification, is dependent upon the output. The circuit has been so designed, that when the output increases, the I.F. amplification decreases. This naturally results in a decrease of output, and consequently of the negative grid bias, with the result that the I.F. amplification increases again; automatically keeping the volume at the same level. In a nutshell the current is moving in a "vicious circle."

The great value of the experiment lies in the fact that it has definitely opened up the solution of successful shortwave international transmission and reception. Further experimental work is in hand, and it will be interesting to see whether the solution which will finally enable the amateur to entirely forget fading, will be the result of discoveries having a bearing upon the transmitter, or the receiver.

The Radio Knife

Surgical Invention

RADIO in America has been adapted in many novel and ingenious ways to serve the needs of the people, but in nothing more useful than its recent application to surgery. It has been used to provide a bloodless surgical instrument in the form of a radio knife. A patent, covering the circuit used to perform the work, was applied for as early as 1919, and the first public demonstrations of the knife were made about five years ago. Today many of the largest hospitals include it among their surgical equip-

ment, as it has proved very adaptable to certain kinds of operations.

The radio knife is a high-frequency function. The circuit used to furnish the rapidly-vibrating impulses is easily recognisable as a transmitting circuit identical with those used for common messages. The difference is in the fact that the high-frequency currents used in the knife are controlled and directed to the electrodes, which are placed in certain relationships to the human body.

In performing a surgical operation the electrode does not actually come in contact with the flesh. It is kept a fraction of an inch distant, and the high-frequency currents passing from the electrode sear the flesh and separate the tissues just ahead of it. The edges of the flesh are seared to such an extent that the blood is sealed within.

The discovery of the radio knife was accidental. The idea was suggested when it was found that the caps worn by the Navy personnel became hot in the front when worn in the laboratories where high-frequency currents were being generated. The cause was found to be that the metal band across the peak of the uniform caps became heated by the radio-frequency impulses in just the same way as the elements of a vacuum tube are heated when surrounded by a coil carrying a high-frequency current in the modern process of manufacturing wireless valves.

The largest manufacturers of wireless sets in America have recently gone into the manufacture of radio knives to meet the very extensive demand. Surgeons have given their final approval of the new instrument which has been described as "the most humane method of surgery that has ever been known."

ON the shelf of every Radio Listener should be found the RADIO LISTENERS' GUIDE

AN INDISPENSABLE WORK.
NEW EDITION OUT THIS WEEK.
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2/9 Posted.
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we can fit

Our Famous Short Wave Addaphone

Works excellently on all types
of Sets. All-Electric or Battery. Built by and obtainable
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Telephone 20-798.