



Vol. IX No. 226

Registered at the G.P.O. as a Newspaper

FRIDAY, NOVEMBER 22, 1929

Two Pence

PRINCIPAL CONTENTS

Special Articles, with Pictures, on German Broadcasting, Music, Art, Crafts, and Scenes of Interest, written by Leading Authorities and Scholars

Heard on the Continent

Foreign Stations in Order of Frequency

Which Station was That?

Replies to Queries

WORLD-RADIO

Station Identification Panel LEIPZIG (Germany) (Revised)

Frequency: 1,157 kc/s.

Wavelength: 259 m.

Power (Aerial): 1.5 kw.

Approximate Distance from London: 537 miles.

Call: "Achtung! Achtung! Hier sind die Mitteldeutschen Sender Leipzig und Dresden..." ("Here are the Central German transmitters, Leipzig and Dresden...")

Man announcer.

Interval Signal: Ticking of clock.

Relay Station:

Dresden (941 kc/s; 319 m.; 0.25 kw.)

A booklet containing a reprint of these panels can be obtained from the B.B.C. Publications, Savoy Hill, W.C.2. Price 1s.

Letters should be addressed to The Editor, "WORLD-RADIO," Savoy Hill, Strand, London, W.C.2.

RATES OF SUBSCRIPTION to "World-Radio" (including postage). Twelve months: Inland 13s., Canadian 13s., Foreign 14s.; Six Months: Inland 6s. 6d., Canadian 6s. 6d., Foreign 7s. Address—"World-Radio," 8-11, Southampton Street, Strand, London, W.C.2.

An Income of £200 a year and a cash payment when you are 65

THAT is what a man aged 30 next birthday may secure by taking out an Endowment Assurance Guaranteed Bonus Policy with the Prudential.

The annual premium would be £35 8s. 4d., but allowing for Income-Tax rebate at 2/- in the £1, and assuming that the rate and conditions of rebate remain unchanged, the

YEARLY OUTLAY WOULD BE

£31 : 17 : 6

(less than 54/- a month)

and in the event of death before 65, £1,000 plus guaranteed Bonus Additions of £30 a year (almost as much as the yearly outlay) would be available for his dependants.

If you would like a Guaranteed Income of £200 a year at age 65, or earlier, Fill in and Forward this Coupon.

1. THE

PRUDENTIAL ASSURANCE COMPANY, LTD., Holborn Bars, E.C.1.

Please send me particulars of an Endowment Assurance Policy with Guaranteed £3% Bonus which will enable me to secure an assured income of £..... at age.....

My age next birthday is.....

Name (Mr., Mrs., Miss.)

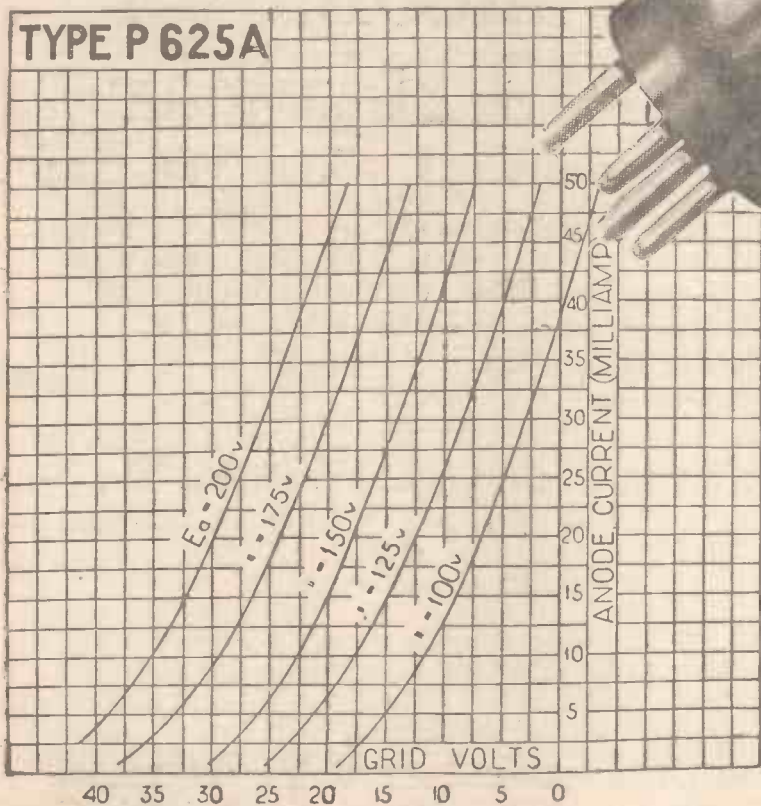
Address

W.R. 22/11/29.

P.P. 107-200.

MAZDA P.625^A

EFFICIENCY AND ECONOMY



MAZDA P.625^A

Type P625A is a super-power valve, and is capable of giving a high power output without distortion. It has been designed for operating cone and moving-coil type loud speakers.

The volume obtained with this valve when used in the final L.F. stage is sufficient for most purposes, whilst the quality of reproduction over the whole of the musical range is bound to please all lovers of good music.

Those who desire a large volume of sound and better quality of reproduction should fit the valve in the final stage of their receivers.

PRICE 15/-

The AMAZING

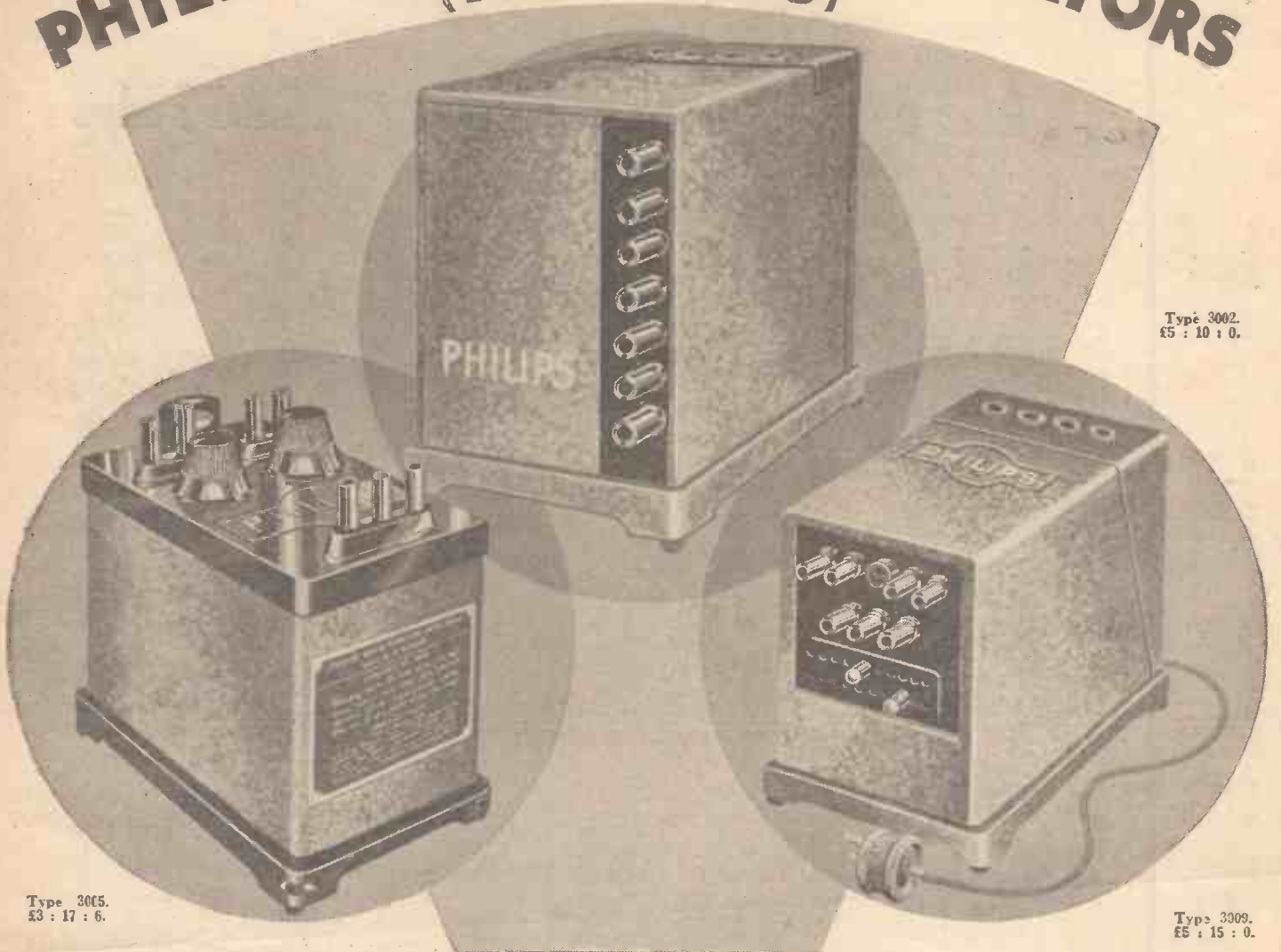
MAZDA RADIO VALVES

SPECIFICATION:

Filament Vo'ts	...	...	...	6.0
" Amperes	...	...	...	0.25
Max. H.T. Battery Volts	...	...	...	200
Amplification Factor	...	...	...	4
Anode A.C. Resistance (ohms)	...	...	...	1,600
Mutual A.C. Conductance (MA/V)	...	...	...	2.5

THE EDISON SWAN ELECTRIC CO. LTD.
1a, NEWMAN STREET, OXFORD STREET, W.1

PHILIPS BATTERY ELIMINATORS (H.T. UNITS)



Type 3002.
£5 : 10 : 0.

Type 3005.
£3 : 17 : 6.

Type 3009.
£5 : 15 : 0.

It is cheaper to use a Philips Battery Eliminator and take your current straight from the mains than to buy rapidly-wasting batteries at frequent intervals. Also it improves reception by the complete elimination of battery voltage-drop and makes your set absolutely reliable.

One of the three types of Philips Battery Eliminators meets your needs. Types 3009 and 3002 work off A.C. mains, Type 3009 giving G.B. as well as H.T. current. For D.C. mains there is type 3005.

For 10/- down you can have any of these on Philips Easy Payment System.



PHILIPS

for Radio

Philips Radio, Philips House, 145, Charing Cross Road, London, W.C.2.

SO EASY TO WORK

. . . SUCH GLORIOUS TONE !

Not just one model, but a whole range of sets and speakers to choose from !



This new Moving Coil Speaker reproduces with absolute fidelity every note in the musical scale, every detail of instrument and voice. By general consent the finest achievement in the reproduction of radio. Cabinet models—type 110 for operation from 6-volt accumulator costs £7.0.0; type 120 for D.C. mains, £7.10.0; type 130 for A.C. mains (with rectifier unit) £12.12.0. Moving Coil Units from £4.10.0.

Particularly simple to work—inexpensive to run—bringing in a wide range of stations—Model 39 is the very latest type of three-valve receiver. Its price, in handsome cabinet, with Marconi Valves, is only £13, or with full battery equipment £15. 15. 0. For A.C. mains, £21. 0. 0.

MUSIC—distinct, flawless in tone—as if you were in the studio itself! Speech—startlingly natural! Britain or the Continent at the touch of a dial . . . both equally clear, equally easy to get. As loud or as quiet as you like; the other dial regulates that.

That's what you get from a Marconiphone receiver-and-speaker. And it's always at the top of its form. For it is made by the men who pioneered wireless from its earliest days; all their skill and experience are put into the making of Marconiphone radio.

Any dealer will gladly demonstrate these sets and speakers. If you do not know of a dealer near at hand, write to the Marconiphone Company Limited, 210-212, Tottenham Court Road, London, W.1.

MARCONIPHONE

The first and greatest name in wireless

Marconiphone radio includes three, four and five-valve receivers to work from electric mains or from batteries. And, of course, the very popular 5-valve portable. Loudspeakers, moving coil and cone, to work from any set.

WORLD-RADIO

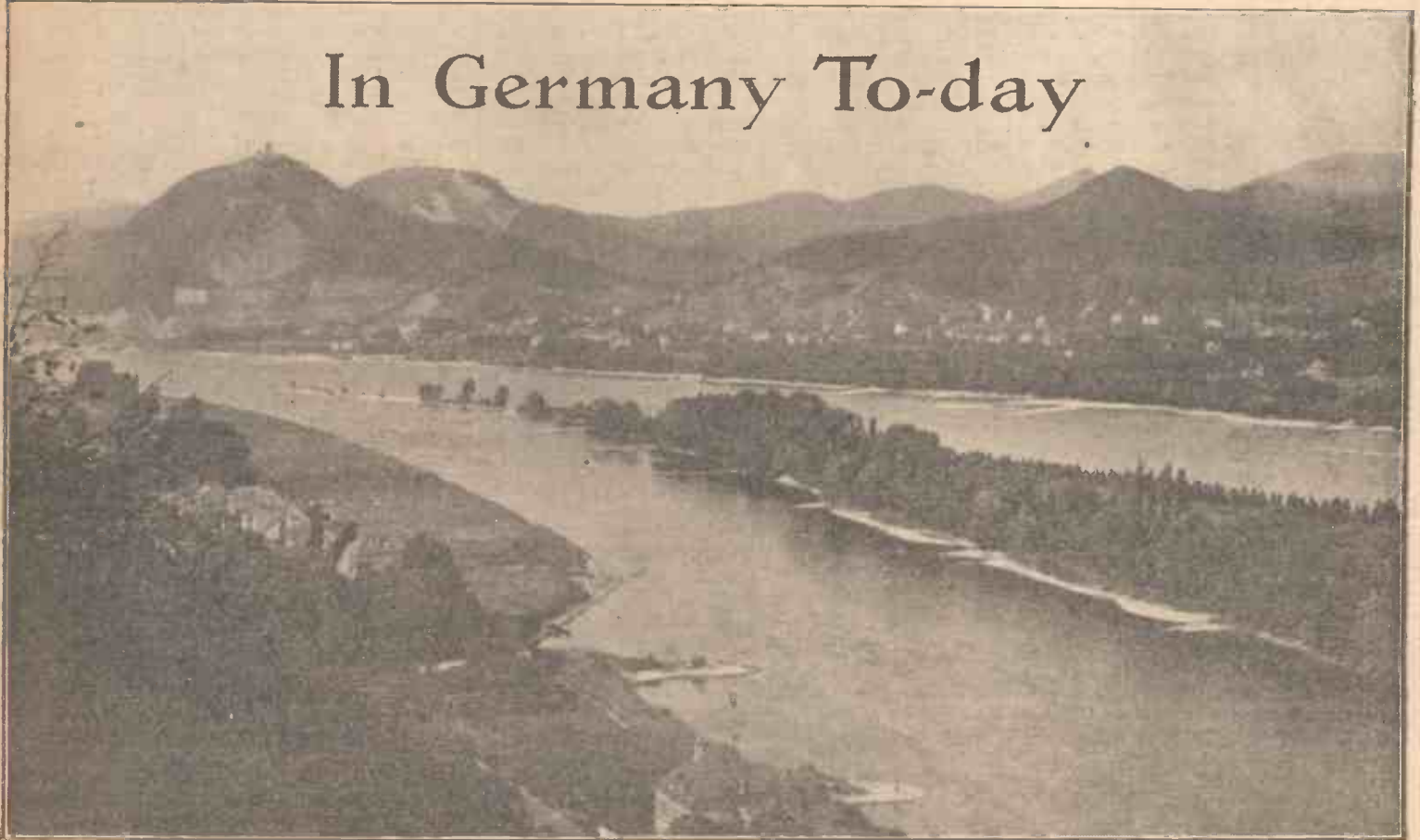
Vol. IX. No. 226.

Registered at the G.P.O.
as a Newspaper.

FRIDAY, NOVEMBER 22, 1929

TWO PENCE

In Germany To-day



The Rhine, showing the Drachenfels Ruin and the Siebengebirge
"The castled crag of Drachenfels Frowns o'er the wide and winding Rhine."

A blending of all beauties; streams and dells,
Fruit, foliage, crag, wood, cornfield, mountain vine,
And chiefless castles breathing stern farewells
From grey but leafy walls, where Ruin greenly dwells.

And there they stand, as stands a lofty mind,
Worn, but unstooping to the baser crowd,
All tenantless, save to the cranny wind,
Or holding dark communion with the cloud.
There was a day when they were young and proud;
Banners on high and battles pass'd below;
But they who fought are in a bloody shroud,
And those which waved are shredless dust ere now,
And the bleak battlements shall bear no future blow.

* * * * *

The castled crag of Drachenfels
Frowns o'er the wide and winding Rhine,
Whose breast of waters broadly swells
Between the banks which bear the vine,
And hills all rich with blossom'd trees,
And fields which promise corn and wine,
And scatter'd cities crowning these,
Whose far, white walls along them shine,
Have strew'd a scene, which I should see
With double joy wert thou with me.

* * * * *

The river nobly foams and flows,
The charm of this enchanted ground;

Deutsche Botschaft,
9, Carlton House Terrace,
London, S.W.1.
November 18th, 1929.

Sir—I have heard with great pleasure
of your intention of devoting the forth-
coming number of WORLD-RADIO
mainly to Ger-
many. I am con-
vinced that this
will still further
increase the num-
ber of those who
both in England
and Germany are
eagerly listening
to the programmes
sent out by the
stations of the
other country.
There can be no
doubt that broad-



(Lafayette) casting, owing to
its truly international range of appeal,
goes a long way towards making the
nations understand and appreciate each
other, and thereby bringing them nearer
together. I am, Sir, Yours faithfully,

The Editor,
WORLD-RADIO.

R. L. L.
German Ambassador.

And all its thousand turns disclose
Some fresher beauty varying round:
The haughtiest breast its wish might bound
Through life to dwell delighted here;
Nor could on earth a spot be found
To Nature and to me so dear,
Could thy dear eyes in following mine
Still sweeten more these banks of Rhine!

Here Ehrenbreitstein, with her shatter'd wall,
Black with the miner's blast upon her height,
Yet shows of what she was, when shell and ball
Rebounding idly on her strength did light:
A tower of victory! from whence the flight
Of baffled foes was watch'd along the plain:
But Peace destroy'd what War could never blight,
And laid those proud roofs bare to Summer's rain—
On which the iron shower for years had pour'd in vain!

Adieu to thee, fair Rhine! How long delighted
The stranger fain would linger on his way!
Thine is a scene alike where souls united
Or lonely Contemplation thus might stray;
And could the ceaseless vultures cease to pray
On self-condemning bosoms, it were here,
Where Nature, nor too sombre nor too gay,
Wild but not rude, awful yet not austere,
Is to the mellow earth as Autumn to the year.

BYRON'S Child Harold.

BROADCASTING

Six Years' Progress in Berlin

From a Small Room to a Giant Building

By FRIEDRICH GEORG KNÖPFKE, General-Director of Funk-Stunde, A.G., Berlin

1923

September-October. The time of the inflation. The chase after the dollar. The mark counts only in millions. At this time German broadcasting is born. Only limited equipment is available, and listeners have to be won over—a relatively hard problem, for they have to pay sixty gold marks a year (in a single payment!). Therefore, the money in hand has to be used very thriftily and cautiously. A room on the fourth floor at Potsdamer Strasse, 4, is at our disposal as a studio, and—divided by a horse-blanket stretched in between—this must also be shared with the technical operators, so that really only a room about 11ft. by 12ft. remains for the entertainers. It has tissue paper on the walls, replaced later by coarse cloth. The ceiling is prepared for acoustics with twine and strips of paper hanging down from it. An upright piano, a gramophone, chairs, and music-stands furnish the room, and then—the sensation!—the Carbon Microphone. So it starts. The gramophone is used as the stand for the microphone, and when the speaker is taller than the microphone, a thick directory is placed under the latter. On October 29, at the beginning of broadcast entertainment, the number of paying listeners was zero; by December 31, 1,025.

1924

The Technical Staff gets a separate room for their equipment. Thus we can enlarge. The studio is now 22ft. by 12ft. The walls and ceiling get a covering of flannel. The old carbon microphone is replaced by one of a later pattern.

Enthusiastic mail from Germany and abroad! A new modern studio (45ft. by 22ft.) is now planned. We are ready about Christmas, when we say farewell to the little old room where we conquered Berlin and Germany, and I think made our mark in the world. Soon after (April) the listeners' tax is settled at two marks per month, the sudden rise starts. In

April, just 3,520 paying listeners, and by the end of the year, 220,592!

1925

Now we are in the new studio. Fifty to sixty people in the orchestra are accommodated easily. The largest plays (150 members of the company) can run smoothly. The acoustics are marvellous, and the new Reisz microphone puts every other one in the background. Without rest, working mostly fifteen hours a day, the whole station advances. Now the Broadcasting Orchestra and Chorus are founded. But even the new place becomes too crowded. Again we must plan. Another whole floor is taken over. A large room, 58ft. by 29ft., is designed for the second studio. Plans are made, thrown aside, new ones are sketched and worked out, and thus we close the year in a *mêlée* of construction, inconveniences and holiday programmes, but, as a compensation, 443,607 paying listeners.

1926

High-pressure work all along the line! The new studio is finished with wood panelling—not, however, entirely getting away from the flannel. An organ is ready for big performances. Electrical wiring is installed for sound effects, and a water tub proves very good for producing the sound of natural rain, and motor-boats, and similar effects. Sound-proof booths outside the studio make it possible to observe the effects. And then, one day, everything is ready.

The first large play, *The Acoustic Film*, is performed in the presence of the Press. The opera, *Tristan and Isolde*, proves the capabilities of the new room. How Parsifal sounded! Unanimously a great success. All Germany, and even all Europe, pays acknowledgment. By December 31, 561,549 paying listeners.

1927

A year of industrious work and the programmes grow. From three of our studios we broadcast our plays, dramas, and operas. Very often we have to use the courts and stairway halls. Already plans for a new, large building are in

view. And yet we have to make the best of the studios we have. At the end of the year we decide to centralise the whole technical part, and at the same time, to prepare for a new studio. So the year of 1927 closes, with more hard work, and 616,634 paying listeners.

1928

The whole first floor of the building at Potsdamer Strasse, 4, is turned over to us. The various control rooms are centralised, and the new studio (49ft. by 26ft.) is ready for use. The new wood panelling is of walnut. For the placing of the microphone, a "Schäffers tent" is built.

Now we have three large studios; nevertheless, nearly every day we encounter new difficulties. Especially we find the need of rehearsal rooms, and very often have to rehearse in the rooms of a nearby restaurant. The problem for a large broadcasting building with the most modern studios becomes more and more acute. We decide to accept an offer from the city of Berlin to erect our new house in the environs of the Exhibition grounds in the western part of the city. In the meantime, at the end of 1928, the number of our listeners has come up to 711,752.

1929

May 29, 1929, we lay the corner stone for the new giant building. By the end of 1930, the building should be ready for our use.

The entire first and second floors are exclusively for the Funk-Stunde, the broadcasting company of Berlin. The remaining floors are for the Broadcasting Commissioner's offices, and the Reichs-Rundfunk Gesellschaft, the holding corporation for the German broadcasting companies. Four large studios are in preparation. Comparative studies of large concert halls in London, Paris, Budapest, and Copenhagen serve as models. Until then, we have to try to get along as well as possible. Since the summer of 1929, a large concert-hall in the building at Potsdamer Strasse, 9, has been used constantly as a reserve. While writing these lines, the German broadcasting listeners number 2,843,560, and 762,845 of them from the Berlin district.

Six years of German broadcasting have passed. Another year in the old quarters, and by taking over the new building and beginning work there, the eighth year will mean a big advance in German broadcasting.

How the Service Grew

IN his broadcast speech on October 29 of this year—the sixth anniversary of the inauguration of the first German broadcasting company—Herr Knöpfke, the Funk-Stunde's General-Director, mentioned, as an indication of the conditions prevailing in October, 1923, the figure of the first German broadcasting licence fee. It was 60 gold marks. In November, 1923, some weeks after the Funk-Stunde began its service, a proposal—very unfavourably received but afterwards adopted—was made to stabilise the currency on the basis of 20 billion (20 million million) marks to the pound sterling. At this rate the cash savings of twenty million pre-War German millionaires would have been required to make the sum of £1. The country was practically bankrupt. And it was in these circumstances that German broadcasting began its uninterrupted career.

Technically, considerable progress had already been made. As early as 1920 Königswusterhausen was giving occasional broadcasts. Many people remember these transmissions, and they were undoubtedly a great stimulus to radio listeners, who built their primitive sets in order to listen to the concerts broadcast on Sundays and holidays. Herr Erich Schwarzkopf, a member of the great engineering firm, whose works

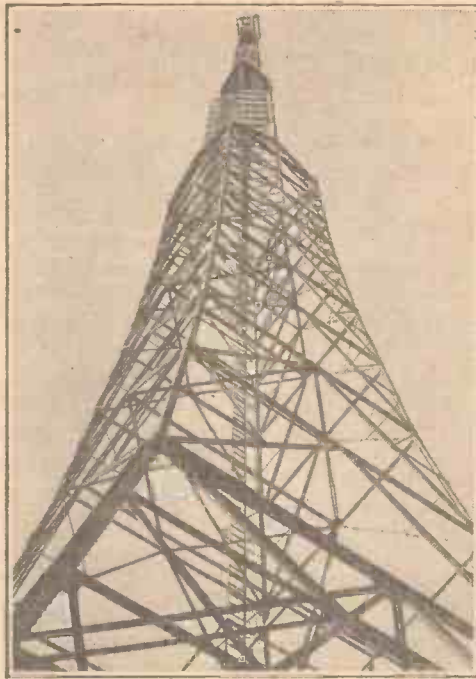


The Aerial masts, Flensburg Station.

every visitor by rail to Königswusterhausen will have noticed on the way, was one of the first broadcasting announcers in Europe. Not until October 29, 1923, however, did the first broadcasting company, the Funk-Stunde A.G., of Berlin, begin its regular transmissions. People in Germany nowadays describe the interest they aroused, and how the performances of crystal sets were compared like conflicting reports of the latest news; but I have not actually met anyone who produced 60 gold marks for the privilege of listening to the broadcasts. Nevertheless, at the end of 1923, the official number of broadcasting subscribers in Berlin was something like 2,000. The half million was topped at the end of the following year (by which time the licence fee had been reduced to its present level of 2 marks monthly), and the first million was reached in December, 1925. There were two millions at the end of 1927. The third million, if not already attained, is expected to be reached very shortly. The commercial growth of the broadcasting organisation is, as Herr Knöpfke truly remarked, without precedent in Germany. At the present moment, the organisers of German broadcasting, and not least the "creator of German broadcasting," Dr. Hans Bredow (who celebrates his fiftieth birthday concurrently with the German number of *World-Radio*), may look back on six years of successful achievement.

They are also, incidentally, looking forward to developments which may in certain respects increase the interest felt abroad in the German stations.

One of the first principles established by the founders of the German system was its investment as a *Kulturgut* in the whole *Reich*. That is to say, the whole of Germany, as represented by the central Government in Berlin (the central Government is now entirely distinct from the Government of Prussia), is in the last resort responsible for German broadcasting. From the first, the German Postmaster-General, the *Reichspostminister*, has been the head of the system. No wireless apparatus, receiving or transmitting, may be used in Germany without the Post Office licence. Under the Postmaster-General is appointed, as his direct representative, a *Kommissar* for the whole *Reich*, who is Dr. Hans Bredow, the *Reichsrundfunk-Kommissar*. From the latter naturally proceeds, as his executive, the *Reichs-Rundfunk-Gesellschaft*, a body which in some ways may be compared with the B.B.C. in England. But before the "R.R.G." was founded, and even before the official nomination of the *Reichsrundfunk-Kommissar*, the various provincial broadcasting companies had already come into separate existence and begun their service: the Funk-Stunde A.G. (Berlin), as mentioned, on October 29, 1923, and eight other companies, with headquarters at Leipzig, Munich, Frankfurt-on-Main, Hamburg, Stuttgart, Breslau, Königsberg, and Münster (now Cologne), during 1924. The Deutsche Welle G.m.b.H., the company controlling the national station, or *Deutschlandsender* at Königswusterhausen, began its service on January 7, 1926. The companies thus independently formed at once acquired a characteristic they have never since lost—that of being to a certain extent autonomous. It is perhaps most accurate to say that their autonomy lies in all cultural matters. Financially, they are now under the ægis of the R.R.G. (which represents and promotes the interests which are clearly common to all the companies); politically they are under their local Government and the Government of the *Reich* in Berlin; in technical matters they are served by the General Post Office, the *Reichspost*—Bavaria having its own special branch of the *Reichspost* for this purpose. In all questions relating to the programmes, however, they are—in so far as political issues are not raised—independent. This is particularly necessary in Germany, because, as is generally realised, Germany is still an empire, or union of states. Before the war there were four kingdoms in Germany, and the Emperor was not officially "Emperor of Germany," but—a subtle but deliberate distinction—"German Emperor." He remained King of Prussia just as the kings of Bavaria, Saxony, and Württemberg remained kings of their own states. And to-day President von Hindenburg is "German President" and not "President of Germany." From a purely political standpoint it might, in fact, be easier for the B.B.C. to extend its functions to India than for the central authorities in Germany to govern unreservedly the German broadcasting companies. It is interesting to note, by the way, that the four kingdoms of the pre-war *Reich* still divide among themselves the broadcasting stations. Prussia (with its proportionately large population), including Hamburg, and also including the national station at Königswusterhausen, near Berlin, has seven; the other three naturally fall in the capitals of the three former



Leipzig Station: Worm's-eye view of one of the masts.

kingdoms—Munich (Bavaria), Leipzig (Saxony) and Stuttgart (Württemberg). As these various states have their own history, traditions, and culture (and are even not without a certain quality which, for want of a better name, is known in Germany as *Particularismus*—a quality which nowadays the co-operation of the broadcasting stations is doing its best to keep in its place, just as formerly did the co-operation of the crowned heads), the necessity of a decentralised system was apparent from the first; and for this reason, although the English system was carefully examined, it was decided to build the German system on other lines. Not one, but ten companies were formed. With the addition of the eleventh, the co-ordinating *Reichs-Rundfunk-Gesellschaft*, the system reached completion.

It may be said that the mere work of preparing the programmes locally, even when it is done, as in Germany, by ten different companies formed on a commercial basis, is not a very large "measure of autonomy." But the local independence is strengthened by the character of certain subsidiary bodies known as *Kulturbeiräte* (advisory councils) and *Überwachungsausschüsse* (supervisory committees), the members of which are appointed both locally and centrally. In the case of the *Kulturbeiräte*, the duties

of which are to consult with and advise the broadcasting companies on questions relating to the programmes, the councillors are all chosen by the local state Government after consultation with the company, and the sanction of the Reichs Minister of the Interior in Berlin is then obtained. The Supervisory Committee (which guards against political tendencies in the programmes) has two of its three members appointed by the Local Government, and only one by the Central Government. This shows clearly that the decentralisation of the German system is, within limits, a very real fact. Needless to say, the necessity the local councils, committees, and companies feel themselves under to work in harmony with the central authorities is reciprocal as far as the latter are concerned. A *Kulturbeirat* and an *Überwachungsausschluss* are attached to each of the ten companies.

In regard to the programmes, the companies are brought together by their representation on the Central Programme Council, which meets—usually in Berlin—under the presidency of the R.R.G. The Central Programme Council concerns itself with questions of co-ordination and policy—the former, naturally, as a matter of technical detail, arising the more frequently. It is one of the most important duties of the R.R.G. to promote collaboration between the companies, and thus effect economy in working. This task is naturally rendered easier by the fact that the income from licences would be much less evenly distributed among the companies if each of them received the exact amount of the subscription obtained within its district.

Financially, the German system is in a strong position. The income from licences of the ten broadcasting companies (that is to say, after deduction of the share of the *Reichspost*) amounted in 1928 to 31,500,000 marks (£1,575,000), plus 500,000 marks (£25,000) from other sources. Expenditure was as follows: management costs, 6,000,000 marks (£300,000); taxes, 1,700,000 marks (£85,000); working expenses, 4,800,000 marks (£240,000); programme outlay, 12,200,000 marks (£610,000); and general costs, including the expenses of the R.R.G. and of the national station at Königswusterhausen, 4,100,000 marks (£205,000). 1,700,000 marks (£850,000) was marked for depreciations; dividends at an average rate of 7½ per cent. on the share capital absorbed 282,000 marks (£14,100), and royalties 114,000 marks (£5,700). The balance of about 1,100,000 marks was placed to reserve. About 25 per cent. of the share capital of the companies is in private hands, the remainder being owned by the *Reichspost*, the local state governments and public bodies.

The news service of the German stations is provided by a central organization, the *Drahtloser Dienst A.G.*, or *Dradag*. The *Dradag* is not itself a news agency, but receives all essential news from other agencies and prepares a service for the *Reich*. Apart from local intelligence, the stations do not broadcast any news other than that supplied by the *Dradag*. Another committee, this time central but composed of representatives of all the political parties to the number of over 140, is appointed to ensure impartiality in the news service.

As to the possibility of future developments in the German system, these, if they materialise, may be accepted as the result of Germany's co-operation in the International Consultative Committee, which held its first meeting at The Hague in September and October.

F. G.



Leipzig Station: Studio in the "Alte Boerse"

Listeners' Problems

A Visitor's Impressions

HAVING recently returned from a seven weeks' visit to Germany, with Berlin as my headquarters, I could not help being impressed with wireless listening conditions in general and wireless receiving sets in particular. Other engagements precluded anything in the nature of an investigation, but my conversations with various types of people, and visits to their homes, enabled me to come to certain conclusions, so that which follows must be taken as an expression of personal opinion.

Absent Aerials

The long but pleasant railway journey set me thinking, for I could not help marvelling at the almost complete absence of outside aerials. We have only to call to mind any railway journey in our own country to remember the countless aerial poles of all shapes and sizes, 90 per cent. of them well out of the perpendicular, and looking for all the world as if a gust of wind would raze them to the ground. These eyesores in the back-gardens may be taken as typifying the amateurish methods adopted to provide a means for collecting the all-important energy necessary for the reception of the broadcasting station. In spite of their awful appearance, however, they serve their purpose, so I was naturally keen to make comparisons with the German efforts in the matter of aerial erection, and, bearing in mind their reputation for doing things well, had anticipated seeing businesslike erections guaranteed to withstand the inclemency of the weather.

But no, I had to confess to disappointment, for these tell-tale aerials were not to be seen. Was I to take this as indicative of national apathy towards broadcasting in general, after having personally spent many pleasant hours of enjoyment listening to those extremely fine German stations which usually come in so well in this country on a normal wireless set? Disillusionment was to follow, but not in the way I imagined.

The housing question in the large cities seemed to have been solved by the erection and



"... large dwellings as flats"

utilisation of very large dwellings as flats, and a slight impression of what I mean will be conveyed by the accompanying illustration. Since many families were quartered in each building, a back-garden, as we know it in England, was almost non-existent, so no back-garden, no back-garden aerial. But it did not take me long to find that the wireless industry was quite flourishing. A tour round the shops was sufficient for that. So what form did the aerial energy collector take? Was it a frame aerial or some form of picture rail aerial? A few inquiries and a more critical observation settled the question.

On the roofs of these tall houses, out of sight of the person in the street, were placed not one aerial, but often six or eight, ingeniously contrived to be clear of one another, and these were led into the respective apartments. I trembled to think of the length of the earth lead for, say, the top flat, which of itself would give reception almost equal to that secured with the outside aerial. Indeed, this frequently was the case, an earth connection alone, to a nearby water main, giving all the reception required.

Then again, in a large number of houses I found that the electric light wiring system had been pressed into service by connecting the set to it through a pair of large, fixed condensers. The listeners in all the cases quoted were the unfortunate victims of environment, and there was only one logical outcome, namely, that distant reception was generally at a discount. Some would point out that this should prove advantageous, for it would create a desire to make this semi-local reception of the broadcasting stations within range a joy to listen to; but, speaking generally, this was not so.

Economics versus Quality

Of late we in this country have adopted "quality" as our slogan, with "quantity" as a secondary consideration, so with an ear attuned to this state of affairs, I was frankly disappointed to find that the reproduction of music and speech was far from being all that could be desired. No one will gainsay that the German is musically inclined—witness the popularity of operas and musical festivals!—so to what could one attribute this apparent disregard of really good loud speaker quality? From the visits I paid to the broadcasting studios and stations it was evident that no pains were being spared to make the transmissions the best possible, so the fault was nearer home.

Conditions in Germany cannot be regarded as prosperous, and no doubt some of the trouble was brought about by the absence of the necessary spare cash with which to purchase the best of loud speakers. There was another cause, however, and this was in the wireless receiver itself. Speaking broadly, the quality of the components used in the construction of the average wireless set that I saw was not on a par with those we are accustomed to use in this country. Components seemed to my mind to be made more with a view to price than to performance, and while individually this would not make a great deal of difference in a comparative test, collectively these small differences were bound to be felt.

Few Portables

Then again, the multiple valve is particularly popular, and, while this gives really excellent results, I do not see how it can equal individual valves coupled externally. In many homes one found a set comprising one multiple valve, tuning condenser, and a pair of plug-in coils, so that you can picture how small were the dimensions of the home set. For local reception

Southern Germany

The Beauty Spots

By A. A. GULLILAND.

GERMANY caters for nearly every taste in natural surroundings. If you want the North Sea, go to one of the Frisian Islands, Borkum or Sylt; if you want the sea, without the nuisance of having to run after it when the tide is out, go to the Baltic—to Rügen with its chalk cliffs, or to one of the many popular resorts beloved by the inhabitants of Berlin, Heringsdorf, or, further off, the little town of Rostock. If you want the great open spaces, go to the Lüneburger Heide, which



[Photo: Gulliland]

A view into the Ludwigstrasse, Munich

stretches from Hanover to somewhere near Berlin. If you prefer romance, and heaps of it, I suggest the Harz Mountains, the Valley of the Elbe above Dresden, or the Rhine from Mainz to Cologne. If you want simply the country, I should recommend Brandenburg, to the south of Berlin; if your preference is for large estates, Eastern Prussia will fill the bill. If, on the other hand, you like mountains—not the snow-capped Swiss mountains, but mountains that are green in summer and white in winter,

(Continued on next page)

these are admirable, and when the whole set complete can be bought for the price of one high-class British transformer you can see that the Germans score here.

Realising this question of aerial difficulty arising out of local conditions, one would have thought that portable sets would have been extremely popular but my impression was that this was not so. There are not nearly so many makes to choose from as we have here, and the performance of those available is behind the British set. Cabinets for loud speakers and wireless sets seemed to be made mainly from mouldings, and in the larger sets a tendency towards the drum drive tuning is noticeable.

Taking a broad view, therefore, I was forced to the conclusion that the conditions for wireless reception were somewhat against the individual, and the listener seems to have accepted this as inevitable, with the result that set performance and loud speaker quality have not yet reached the high standard which now prevails within our own shores.

H. J. B. C.

mountains that are difficult to climb because of the many rocks, or mountains up which you can scramble without a guide, mountains that are not far from civilisation—then come to Southern Germany. This sounds like a folder of a tourist company, I know, but it happens to be the truth. Take the undulating hills along the river Main; the Odenwald near Heidelberg; the Bayerische Wald on the frontier between Bavaria and Czechoslovakia; the Black Forest; and, last and highest of all, the Bavarian Alps. Enough for every taste. Such towns as old-world Nürnberg and tiny little Dinkelsbühl and Rothenburg are in Southern Germany, famous Bayreuth is there, Baden-Baden and Kissingen, to mention only two famous watering-places, are there; active Stuttgart, sleepy Heidelberg, and rousing Mannheim are there; and, the largest of all, München, with its beer, its art, and its *Gemütlichkeit* (happy-go-lucky spirit)—all are in Southern Germany.

Many years of travelling through this country, of visiting the towns, of passing quiet days in unknown spots, of trekking by bicycle and by car, have made me familiar with the greater part of it. Still, there are many towns and spots I have not visited, so this article must not be taken as a concentrated guide-book.

Politically, Southern Germany consisted of the Grand Duchy of Baden, of Hohenzollern, of the Kingdom of Württemberg, the Kingdom of Bavaria, and the Grand Duchy of Hessen-Darmstadt. To-day the states remain, but they are all republics with Presidents, except that of Bavaria, which has no President, the Prime Minister acting in a kind of dual part.

From Darmstadt, not far from the Rhine, we go upstream towards Mannheim, and pass along the famous Bergstrasse—in May just one mass of bloom. A little to the east is the Odenwald, where the old Teutons worshipped Odin. Mannheim is just a thriving industrial town, with Ludwigshafen and the Bavarian Palatinate on the other side of the Rhine. The former rulers of Bavaria and the Palatinate are the last direct descendants of the House of Stuart which reigned over Britain until 1688. Then Heidelberg, dear to the hearts of many students, and recently made more than popular by the number of films, plays, and songs about it! The old ruined castle frowns down upon

the town tucked away between the Odenwald and the River Neckar; and the famous rose-tree, hundreds of years old, together with the enormous wine-barrel, are none too pleased, one imagines, to be the constant "sights" thousands of hustling tourists have to see at the dictates of guide or guide-book.

which Bavaria's new high-power broadcasting station is to be erected and following the line of the mountains, we come eventually to the Königsee, Germany's most beautiful lake, and over to Salzburg, in Austria, back past the Chiemsee, where another of Ludwig's dreams was realised, this time in the form of a castle

more costly than Versailles. Next we come to Augsburg, Nürnberg, Bayreuth, then back through beautiful Württemberg, making a slight detour to reach Ulm on the Danube, the frontier between Bavaria and Württemberg. Through the Rauhe Alb, a kind of plateau with an extremely rough climate, we get to Stuttgart, redolent of Schiller, and the Karlschule—in contrast to the new skyscrapers. On to Esslingen, Cannstadt, Marburg, down the Neckar, Heilbronn, past the famous convent Maulbronn, down into Baden, to Pforzheim, the home of famous gold and silver smiths, back to the Rhine, and to where we began!

I know it has been rather a race, but whoever takes this route will see the most beautiful parts of the country, as well as the towns, and will do so without missing very much. And each fresh spot discloses new beauties, new scenery, more restful places.

The quite "undiscovered" ones I am keeping to myself—even though it be selfish, for, otherwise, where would the "undiscoveredness" be? Besides, you may find these for yourselves, or even other untouched spots.



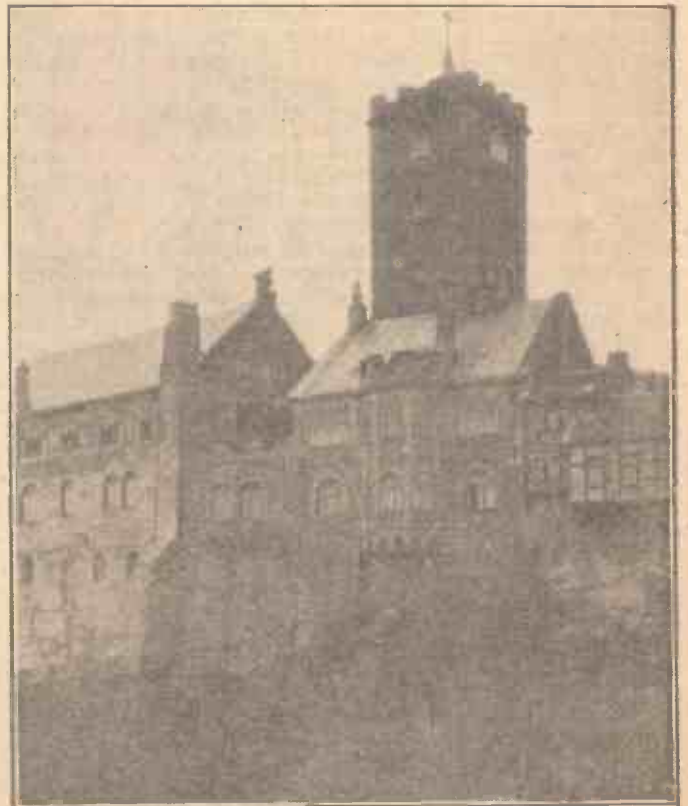
[By courtesy of German Railways Bureau.]

The Castle of Neuschwanstein, in the Bavarian Alps. Built by King Ludwig II.

Back on the Rhine, we come to the capital of Baden, Karlsruhe, and, not far away, Baden-Oos and Baden-Baden, with the wonderful Lichten-thaler Allee, the Yburg, the Merkur, with its funny railway, the quietly-flowing Oos, the Kursaal, the theatre, and people from all parts of the world. Baden-Baden I think is most beautiful in spring, the summer being too warm for my taste. Farther down, there is the little town of Rastatt, then Freiburg-im-Breisgau on the outskirts of the heart of the Black Forest. Freiburg is a dear little old-world town with a university of world renown. From here we go up to the Feldberg, to Titisee, and the many other mountains, lakes, and resorts; then over towards Württemberg, Donau-eschingen, near to which the Danube begins its long journey down to the Black Sea.

Starting from the Bodensee, through the Allgäuer Alpen, where a lot of Germany's butter and cheese comes from, passing near Oberstdorf, famous for its winter sports, past old towns, always keeping along the mountains, we come to Füssen, and round the corner we come upon a castle in the style of the thirteenth century, but built just sixty years ago—Neuschwanstein, built by Bavaria's unfortunate King Ludwig the Second, the great friend of Wagner. Up here, we are told, Wagner composed some of his famous operas, looking down on to the deep blue Alpsee, into which the King nearly threw himself when the guards came to take him prisoner.

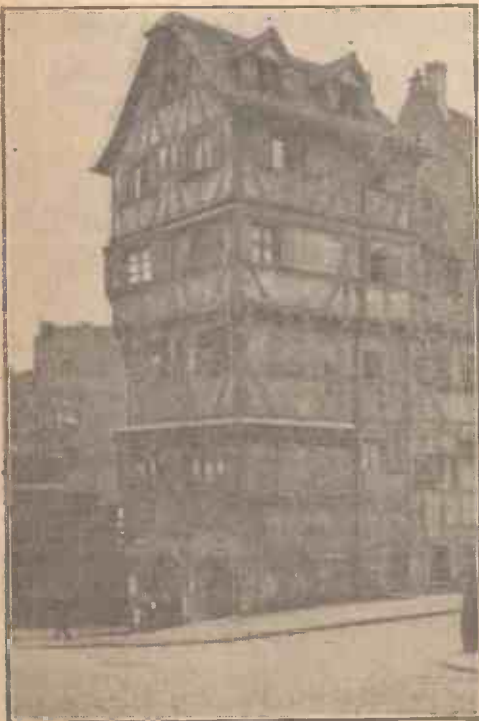
Past Oberammergau, where the famous plays will take place next year, and presently over a steep pass down to the Kochelsee, near



[Photo, Gulliland.]

Eisenach. The Wartburg where Luther was imprisoned and where Tannhauser sang

The Black Forest and the Bavarian Alps are ideal in summer and in winter, as there is ample space and occasion for winter sports, but June or September are not crowded months, and are still warm and fine enough for an undisturbed tour.



[Photo, Gulliland.]

Old Nürnberg. The famous Toblerhaus.

Present-Day Music

By Professor Freiherr HERMANN W. von WALTERSHAUSEN

IN German musical circles there is much talk of a serious crisis in the world of music. The older and conservative school is up in arms against the mischievous younger generation, believing that by the latter's writings music is losing its soul and its nobility. On the other hand, the younger school oppose all tradition, mock and deride the creations of the older generation as out-of-date romanticism, which, by its constant repetitions of expressions of pathos, had run its course and had become reduced to an absurdity. Both schools, the old as well as the new, attribute the existing crisis in part to the fact that the post-War generation has turned its back on things of the mind. How often do we observe during the performance of works by contemporary composers that the public leave the concert-hall. The reason they give when doing so is usually that this music, quite irrespective of whether or not it is written in traditional or modern style, does not concern the people, since the creations of our age have become an art for art's sake, and are without any national or popular foundations.

"New Music"

Let us attempt to find out how much truth these assertions contain. What is this so-called school of "New Music." It is called new not because it is new, but rather because it has a marked tendency—it is written with a view to effect. The history of music shows us a similar trend which was fought about between the two schools known as "Ars Nova" and "Nuove Musiche." The "new music" arose out of attempts to transfer to music anarchical principles of literature and the fine arts. One spoke of "atonal music," indicating thereby a manner of composition which disregarded the traditional rules of harmony. "Atonal music" is now a thing of the past, and, while it did not produce any enduring works, this revolutionary movement resulted in the elimination of a good deal of useless old rubbish. Whereas "atonal music" was at bottom a symptom of a decaying musical language of the nineteenth century, the tendency towards primitive music has an entirely different origin. Music had become super-intellectual. It had lost in rhythmic power, with the result that with a large pro-

portion of the public there developed a desire for a new motive-power in music. The penetration of the primitive and exotic into German music has been observed on previous occasions. It is now nigger music, especially in the form of jazz, which has conquered the field. But this preference for the pure rhythmic music has deeper causes. It is part and parcel of a newly awakened consciousness of the physical, which we observe everywhere around us. German music will be able to learn a good deal from this movement, if only it is capable of attuning the stimulus received therefrom, or combining with its own national temperament.

A New Spirit

"Atonal" and primitive music is undoubtedly a passing symptom of the decadence of the post-War period, but as opposed to that we find the new generation, as well as a considerable section of the truly creative members of the older generation, treading sane and wholesome paths in an earnest endeavour to overcome weaknesses of the last few decades. There is no doubt whatever that the music of the nineteenth century was overladen with intellectualism; but we now observe everywhere signs of striving for a purely musical form, and, hand in hand with it, another movement makes itself very evident. During the last few decades, owing to its all-too-strong declamatory expression, music has unquestionably receded from polyphony. To-day it would almost seem as if a new age of polyphony were dawning. The greater freedom gained from the atonal aberrations aids the independence of polyphony or, as it is styled to-day, of the horizontal part-writing.

Let us admit that a crisis exists; it is not one of collapse, but rather is it to clear a path which will lead us to new goals.

The next few years will show us whether German music is strong enough to find a synthesis of these numerous new currents and stimuli, as they will also show whether the German national spirit is strong enough to free

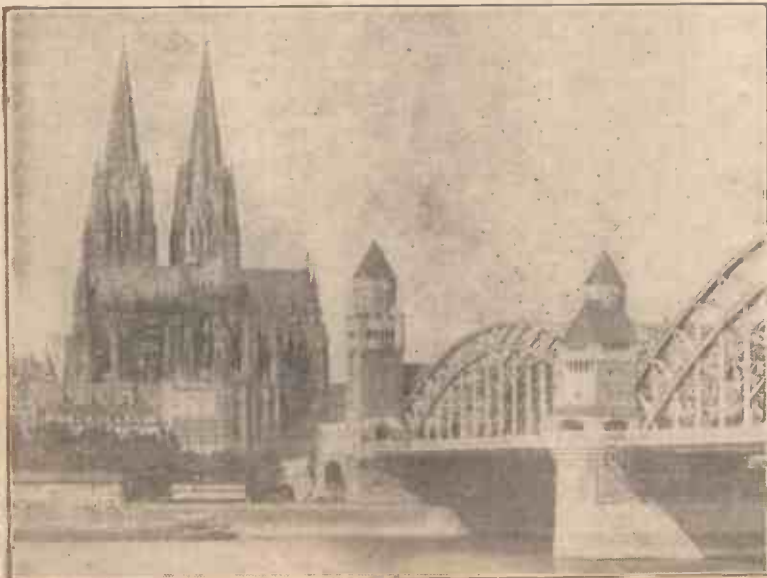
its culture from the many foreign elements that have penetrated it.

A National Revival

I mentioned before that the greatest danger confronting music of to-day lies in the fact that it has become detached from the national spirit. All truly great music has always been national—music that breathes the spirit of the native soil and hearth. Many invaluable efforts are now being made in this direction. Whereas in pre-War years music was rather the privilege of a minority, to-day the urge is to tap the latent musical powers of the whole people with the aid of the school, a renewed activity of choral singing, the forming of musical societies and, last but not least, with the help of broadcasting. We see here a revival of Plato's conceptions of the inherent powers of music to help to form and preserve the State, and, on the other hand, the State is confronted with quite new tasks.

Quite apart from these official movements, the youth of Germany proceeds on its path independently in the so-called "musical youth movement," which arose out of the *Wandervogel* movement. Though many mistakes are being made here, the fundamental ideas underlying this movement are right. Attempts are being made to return to truly national music, to the old folk-song, and to revive the ancient art of *à capella* singing.

All this "new music" suffers from one serious disability. It places aim and school above all else, and it forgets that all true art, and, therefore, all truly new music, is created by individuals and not by "schools." Germany is fortunate enough to possess quite a number of powerful and creative artists, who proceed on their path undeterred by the grotesque dictates of fashion, men and women who are not concerned with the writing of compositions which will satisfy certain schools of thought, but whose aim it is to create works that will endure.



Cologne: the Cathedral and Hohenzollern Bridge.



The Rathaus (Municipal Offices), Cologne. An ancient building, with which several legends are connected.

(By courtesy of Rheinisch Museum.)

Art in Modern Germany

The "New Simplicity"

By Geheimrat Prof. Dr. W. PINDER, of the University of Munich

In an interview with our Munich Correspondent

GERMANY is prolific in Art and in its application to all mediums of expression and to the enrichment of life. Artists, sculptors, architects, workers in applied art, such as goldsmiths, silversmiths, interior decorators, dyers, book-binders, to name only a few, are not only creating new ideas, but are turning them into something worth while.

It is very difficult to say a little without saying a good deal, so that if I leave a great many things and names unuttered this does not mean that they are not worthy of mention.

Let me begin with the painters. There are some typical Impressionists still among us. The bulk of the public still clings to this form of painting, although it is quite *passé*. I would like to mention one name here—Liebermann. He does not belong to our time, but it is with great respect that I say this. A man of about the same age (80 years) may be cited as the opposite of Liebermann. I refer to Christian Rohlf. Formerly an Impressionist, he always went with the times and, unlike Liebermann, changed with the times. One compares Rohlf to Christoforus, as the old generation carrying the young generation of art on his shoulders. Rohlf is typically German, especially his colouring. It would not be right to omit mention of Korinth, who recently died, and whose works have had considerable influence on our very modern art. He already belongs more or less to the Expressionists, but he also began as an Impressionist.

Slevogt, the well-known artist and illustrator, can be regarded as one of the younger (60 years

old) Impressionists, and, as his antithesis, a man of his own age, Emil Nolde, a typical Expressionist.

On the subject of Impressionist plastic art, I would like to say that this form has been done away with completely in Germany. Hildebrand, the famous sculptor, who died some time ago, is a typical representative of the academic style. Now the academic style has few friends in Germany. But this applies to painting without applying to Hildebrand.

If you ask me what is typical of German art, I should say that painting is often the counterpart of musical composition. Take, as an instance, Feininger, an artist and at the same time a composer of fugues, now at the Bauhaus in Dessau. If you look at his work, you seem to see that he not only composes fugues, but that he also paints them. Art is always an expression, but *Expressionismus* is nearer to German taste than any other style.

During the War this style was in vogue. One may name just one exponent, Franz Marc, who fell in the War. It is a curious fact that nearly all the Expressionists were born round about 1880. But most of them, and among them Feininger, have moved with the times, and so we come to the latest style of all, the new simplicity—"Die neue Sachlichkeit." What is *Neue Sachlichkeit*? It is difficult to define, and already there are other new styles about to develop. *Neue Sachlichkeit* is intrinsically a moral style. One sees that the art conscience has been pricking and that it feels ashamed of all the untruths in nineteenth-century art—

ashamed of all the copying from old schools. In architecture, the new style stands entirely on the *Neue Sachlichkeit*.

I should like to say that German painting of to-day is full of vitality, and is represented by many different styles. Nothing has really crystallised; the latest style, *Neue Sachlichkeit*, is already threatened by many others, but this style may be termed the chief one, as far as it is possible to particularise amid the chaos of European styles of painting.

With regard to plastic art—principally sculpture—development has been quieter. One can say that Germany is at present producing sculpture which is both excellent and important. Among numberless sculptors, I will just mention one or two. Kolbe, Lehmbruch (who died not long ago), and Haller Erlach. Sculptors have not been worshipping strange gods, as painters have; and, as I already said, the standard of work is extremely high, many artists having creative gifts and individualism of expression.

In architecture, I think, Germany is at the moment the leading European country. The new school originated in Germany. Wagner and Hoffmann must be mentioned here. Other countries are following our example. Others again are working along independent lines—Holland, for instance. No definite style has gained a permanent place as yet, but the main trend is towards the *Neue Sachlichkeit*, and a revolt against the "fakes" of the nineteenth century.

To sum up, let me say that as regards painting Germany is at the moment in a welter of conflicting styles, at least four principal tendencies receiving recognition, while in sculpture there is less self-consciousness, though the number of excellent artists is very large. In architecture a complete reformation has set in, and we are developing a new style, utterly different from anything that has hitherto been.

What I have said regarding Germany applies also, I think, to Vienna and Austria at large.

The Book Museum

By Dr. H. H. BOCKWITZ, Director of the Deutsche Buchgewerbehau, Leipzig

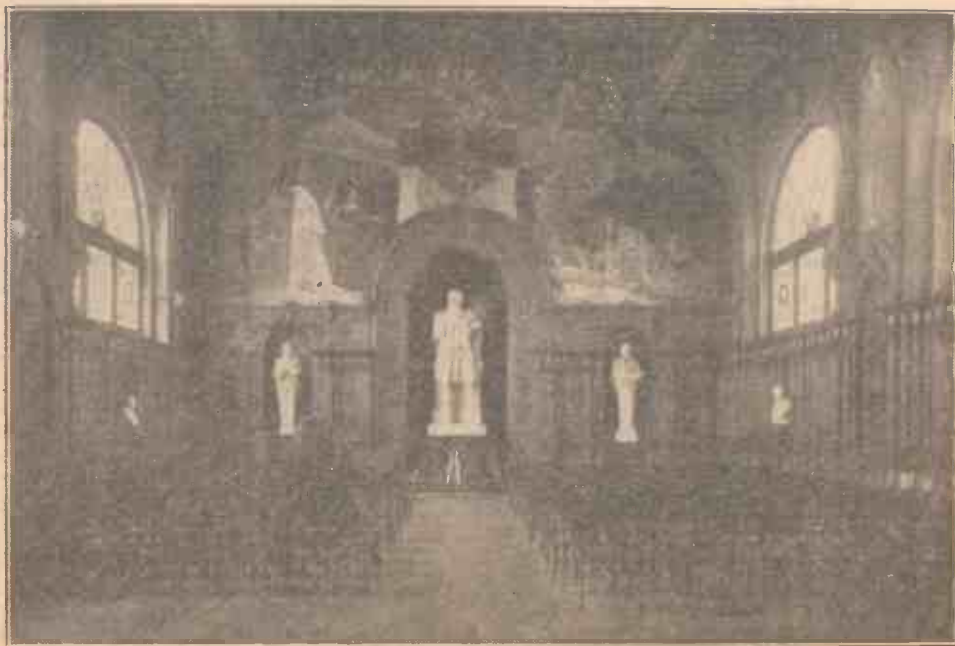
IN the centre of Leipzig's quarter in which this city's tremendous book trade in all its branches is situated, there stands a magnificent building known as Das Deutsche Buchgewerbehau, the seat of the Deutsche Buchgewerbeverein (German Book Trade Federation). This organisation, though not Germany's oldest, is the one which, ever since its formation in 1884, has done most to further the interests of the entire German book industry. At this period the latter had reached a low ebb. Looking at the position in other countries, the Leipzig people found at the end of the nineteenth century, that England had become the leading country, compared with which Germany's production had become rather mediocre. The works of William Morris and his school were taken as a model. Germany recollected the existence of specimens of early printing, the imperishable works of Gutenberg and his successors, a thorough study of which had served as a starting-point in the reforms brought about by Morris and his school. In order to further the artistic development of the book industry, the Federation set itself three tasks: the establishing of a bookcraft museum, the forming of an academy for the graphic arts and crafts, and the furtherance of trade exhibitions.

The Federation attached special importance to the establishment of the Museum, which, in addition to accommodating model printing productions of early days and of those times, was also to demonstrate the historic development of the graphic arts and crafts from their origin to the present day. The Government of Saxony assisted the Federation by putting at its disposal

a unique collection of valuable manuscripts, *incunabula*, and prints of the fifteenth and earlier centuries. This collection had been bequeathed to the State by a Dresden master-tailor, Heinrich Klemm, who had brought it together in the second half of the nineteenth century. In this

way the Museum received a splendid foundation, and it was now able to exhibit the development of the book from the days of the manuscript to Gutenberg and his disciples, and on to the sixteenth and seventeenth centuries. The greatest treasure among these is a specimen, one of the very few existing in the world, of Gutenberg's forty-two line Bible, printed on parchment with numerous coloured initials and miniatures. By the Heinrich Klemm collection an exact study

(Continued on page 812, col. 3.)



The Gutenberg Hall in the Buchgewerbehau at Leipzig

(Altler Helionovian.)

The Goethe Collection

Leipzig University Library's Treasure

By Professor GEORG WITKOWSKI, Director of the Leipzig University Library *

[Professor Witkowski is one of the most famous of German men of letters and a great authority on Goethe.]

THE city of Leipzig, the centre of the German book world, has always possessed, among the owners of its great publishing houses, public-spirited men, who have benefited arts and sciences by munificent legacies. In its museums we find numerous paintings and sculptures, we find the collection of the graphic arts bequeathed by the publisher Lampe, the various collections pertaining to Geography and Ethnology, the important and comprehensive collection of historical musical instruments (next to that in South Kensington Museum, probably the best in Europe) and the many jewels contained in the Museum of Arts and Crafts. But it is only natural that the collection of books should be the cause most dear to the heart of the bookman, and we find that Leipzig is particularly rich in libraries, bequeathed to it by public-spirited citizens. The most important among these are the Peters Music Library, which is housed in a building specially fitted for it and contains the treasures of music literature of all times, to which it is constantly adding, and the Goethe Collection, which was left to the University Library by Herr Salomon Hirzel.

Salomon Hirzel, the son of a noted theologian and professor of philosophy, was born at Zürich in February, 1804. He completed his studies at the Berlin University and, after spending a few years in a publishing house, became partner in the old-established firm of Weidmann at Leipzig. In 1853 it was changed to "S. Hirzel," a publishing house that is to this day one of the foremost in the world. Many monumental publications have been issued under its *agis*. To name only one, the famous German Dictionary, edited by the brothers Grimm of fairy-tale fame, which has served as a model to most languages for works of a similar nature, is still published by "S. Hirzel." Apart from his business activities, Hirzel devoted all his time to the study of Goethe. His first guidance towards this life-work he received from his father, who himself had made a meritorious contribution to the knowledge of Goethe by editing and publishing Goethe's correspondence with Lavater, a Zürich cleric. Salomon Hirzel devoted himself to this task with a fervent devotion and an untiring zeal. He searched for and collected prints, manuscripts, first editions, pictures, and drawings that were connected in any way with the life of Germany's greatest poet. The University of Leipzig, as a recognition of his magnificent work, conferred upon him a doctor's degree, *honoris causâ*, on the occasion of the centenary of Goethe's entering the University of Leipzig.

Three printed catalogues of his collection which Hirzel published in 1848, 1862, and 1874, give us an idea of the gradual growth of this incomparable treasure. He did not intend these for the general public, but rather as a present to some of his friends, who in many cases had been helpful in tracing and acquiring some of these rarities. They all honoured him as the greatest Goethe scholar, the head of the "Stille Goethe-Gemeinde." When he died on February 8, 1877, he left the whole of this treasure to the University of Leipzig as a permanent possession for the unrestricted enjoy-

ment of generations to come. Hirzel's heirs felt a certain obligation to add to the legacy as much as was in their power, with the result that in 1884 a much more extensive catalogue was issued, this time to the public.

When entering the imposing building of the Leipzig University Library, the visitor ascends a broad marble staircase to the noble centre-hall, which is adorned by the famous *Odyssey* pictures, painted by Friedrich Preller. Large portals lead to a great reading-room, to the manuscript, catalogue, and lending libraries; by a smaller door we enter the Temple, containing the Hirzel Goethe Collection as well as the Schiller Library of Alphons Dürs, another Leipzig publisher.

In reverent silence one enters the sacred hall. It is adorned with portraits of Goethe and of



[Johannes Müller.

Entrance Staircase in the University Library, Leipzig

women whom he had loved, with sculptures and drawings, with framed documents, the oldest of which is a newspaper announcement of the christening of the future great man. Through the glass doors of bookcases we look at hundreds of books, all of which are editions of the poet's works, issued by himself, from the modest little booklets of his earliest years to the number of volumes styled "*Ausgabe letzter Hand*," which were the quintessence of the total creations of an unusually fertile life's work of 82 years. But the greatest treasures of this hall, both in value and importance, are the written documents, penned by himself or his relations. They begin with an entry in the family album by Goethe's noble mother soon after his birth; then follow letters written by the boy Goethe and songs by the student Goethe; these are succeeded by his first important comedy *Die Mitschuldigen* (*The Accomplices*), written by him in beautiful calligraphy for his beloved at Sesenheim, Friederike Brion.

As our eyes rest on the faded writings we are not so much conscious of the benefits this collection has bestowed, and is still bestowing, on science and mankind, as of the presence of the spirit of the great one himself and, in a smaller degree, the life-long devotion of the collector of all these treasures, Solomon Hirzel.

We are tempted to look over the remaining rich possessions of the University Library. There is the "Papyrus Ebers," the manuscript 20 metres in length (although this is only half as long as the "Papyrus Harris" in the British Museum) which deals with medical remedies of the old Egyptians; there are 12,000 other manuscripts and 750,000 printed volumes,

But we did not visit here to-day in order to do research work; rather was it with the desire to spend a short hour in quiet communion with the spirit of Goethe.

BOOK MUSEUM

(Continued from page 811)

of the development of the printing arts of Europe from the earliest stages to the present day has been made possible. With Government assistance it is being continuously extended by the acquisition of foreign works. The Museum contains quite a number of works of Morris's Kelmscott and Cobden-Sanderson's Doves Presses, as well as specimens of the Ballantyne, Chiswick, Clarendon, Eragny, and Essex House Presses. The authorities have also acquired several valuable collections, the three most important of these are the Weissenbach, Becher, and Schoppmeyer collections.

The first contains about 500,000 single pages pertaining to the history of the book, originals and reproductions of title pages, book covers, initials, ornaments, marginal decorations, and many thousands of examples showing the various sides of the graphic industries. The Becher collection, which is world-famous, contains about 400 extremely valuable bindings, covering the whole period of printing, and the Schoppmeyer collection is a means of studying the art of miniature painting. Here we find copies of miniatures taken from the most important libraries of Europe. These have been painted on parchment, and the artists have done their work with such perfection that it is most difficult to distinguish the copies from the originals.

The real show piece of the Museum, however, takes us from Europe to countries of the Near and Far East. It enables us to gain a knowledge of the development of the book by the Egyptians, the Assyrians, Babylonians, Greeks and Romans, and the Mohammedans; and we follow the process from the time of the racial migrations, through the early Middle Ages, the invention of the art of printing, and the resulting great development of the bookcraft, to the present day. The library of the Museum contains about 50,000 volumes, all representative works that serve as an invaluable reference library.

The Federation's second task was the forming of an academy of the graphic arts and crafts. It contains continuation schools for the rising generation employed in the printing trade. It has a permanent education committee, which works in conjunction with the Leipzig education authorities. During the winter months lectures are held which are heard by hundreds of students, and there is also a school for librarians.

The third task which the Federation put before itself was that of holding exhibitions. The International Exhibition of Graphic Arts and Crafts of 1914 (the "Bugra") was the first attempt which had been made to give a complete survey of the whole world's book industries from a scientific, historical, and artistic point of view. All civilised nations were then represented, and many of them, such as England, France, and Austria, erected magnificent buildings to house their exhibits.

We find, therefore, that the manifold threads of the German book trade are centralised in the *Buchgewerbehaus*. The artistic, scientific, and historical sides are satisfied by the Book Museum; the technical, economic, and trade sides by the Federation's "Bugra" fairs; and finally, the educational side by its Academy for Graphic Arts and Crafts.

* On Friday next at 8.30, Prof. Witkowski will broadcast a talk from the Leipzig station entitled "New Facts about Goethe."

German Radio Plays

By HANS W. PRIWIN

SINCE the microphone serves as an intermediary between technique and art, it was necessary to evolve new forms of expression. Thus the growth of broadcasting has produced a new art which is based entirely on acoustics—viz., the radio play. The writing of radio-plays—a few years ago a thing quite unknown—has reached a very high level in Germany. At the beginning of broadcasting a special dramatic art which studied the requirements and limits of the microphone did not exist. Moreover, the prominent dramatists in Germany, as in many other countries, considered that broadcasting was lacking in seriousness and did not promote culture. Only when they became conscious of the all-embracing power which the microphone possessed did they begin to write plays which had other qualities than merely that of an acoustically transposed stage effect. During the first years an attempt was made to adapt classical dramas to broadcasting. The well-known German poet, Arnolt Bronnen, transcribed Schiller's *Wallenstein* trilogy for broadcasting, but the success was negligible. The majority of German classical dramas were similarly adapted, but it soon became clear that these plays, depending so much upon optical support, were not very suitable for the microphone.

A new form of art came now into being. Breslau's young Intendant, Herr F. W. Bischoff, one of the first to devote himself to it, designedly took the film as the starting-point. He originated the so-called *Hörfolgen* (radio sequences) which have established his reputation in Germany. These sequences are not actions built up in the form of drama, but are extracts taken from literature—usually modern literature—and are presented under a general heading as a compact whole—as it were, a painting com-

posed of many smaller pictures. The radio sequence to become most popular among all listeners was that entitled *Song*. This English



Herr Victor Heinz Fuchs, one of the foremost writers of radio plays in Germany and author of "Is Mr. Brown Guilty?"

word is here not used in its literal meaning; it conveys to us in Germany perhaps a small poem or an incident from daily life. Bischoff presented songs by Tucholski, Schnack, Mehring,

and others under such general headings as "Love," "Longing," and "The City." These three themes were illustrated by songs accompanied by impressionistic music faintly kept in the background.

But, of course, in Germany there is no lack of radio plays with a continuous dramatic action, the object of which is to entertain and to grip. One of the best-known authors to-day, whose plays are being continuously performed by all stations, is Victor Heinz Fuchs. This writer generally deals with exciting incidents taken from life. His best known play is *Is Mr. Brown Guilty?* which is performed very frequently. Fuchs is one of the German authors who write exclusively for broadcasting.

To-day we find among these writers a number of men who have previously made their names as stage-dramatists. One who has become widely known as an author of intensely dramatic plays, the subject of which is generally taken from the daily life of the people, is Dr. Friedrich Wolf, a young medical man. He has now turned his talents to radio plays. In a play entitled *S.O.S.* he has endeavoured to reproduce the excitement that gripped the world at the time of the disaster which befell the expedition of the Italian airship *Italia* and its subsequent rescue by the Russian ice-breaker *Krassin*. It would be quite impossible to produce this on the stage on account of its exceptional acoustic effects. This radio play, which a few weeks ago had its *première* simultaneously at eight German stations, was an enormous success—especially at Berlin, owing to the splendid production by Herr Alfred Braun. By the way, the first of this kind of radio play was written by a young Berlin journalist, Herr Mendelssohn, in which he described the hunt for a criminal.

German dramatists are continuing their work on these lines. No longer is the view taken that broadcasting is to serve as a light entertainment only, and Germany's greatest dramatists are competing to extend this youngest form of art and to make it a valuable asset to the artistic world.

Radio Reminiscences

A Listener in Germany—Four Years Ago and Now

By ARTHUR G. ALLAN

A FRIEND of mine, a Scotsman, exiled in the south of Germany for the last six years or so, tells me of his experiences there when broadcasting was in its infancy in that country, and of his impressions when returning to set-building and DX work after a lapse of four years, during which all his listening was done on a humble crystal set. I here set down what he told me.

It seems a long time ago now when I began sitting up and taking notice at repeated news in the home papers of a new discovery, a new medium permitting sound to be broadcast throughout a mysterious something called the "ether." A little later, a weekly paper from home took up a regular feature devoted to wireless constructing. Now and then I came across special periodicals devoted to the new hobby. It seemingly had become a kind of craze in Britain. Here, in Germany, one *did* hear of intrepid people "listening," but I never could quite realise, at the time, that it actually was possible to listen to some person speaking or playing at home without a wire connection.

At last, in 1923, the first broadcasting station was opened over here. But sets were at prohibitive prices, for my pocket at least, and there was no local station available. In the spring of 1924 my local station, Munich, came "on the air," and friends and acquaintances told me of the stolen pleasures that were to be had by

wireless listening on sets made of string and cardboard, or so it seemed to me. Slowly, however, the ethics of broadcasting were evolving, and soon it was not considered the proper thing any more to listen without a licence.

In the summer of 1924 I became as radio mad as my friends. Results with a bought crystal-set made me acquire a one-valver. Valve-sets in those days in Germany were fearsome things. The reception wave-band was restricted to 200 to 700 metres, and the sets were all without reaction on the aerial and had to be sealed by the State authorities. Those wonderful people—I still thought them wonderful people then (not belonging to them as yet)—who built their own sets (valve, of course), had to have special experimenters' licences, only to be acquired by becoming a member of the authorised radio-club and passing an examination, about the horrors of which everybody had heard fearsome stories.

I wanted a second valve, but did not want just tamely to buy the new set; I wanted to build it. The great question was whether German nationals in Great Britain were allowed the same privileges as British listeners. Seemingly it was so, for I was granted permission to take out a preliminary "*Audionversuchserlaubnis*," as the experimenting licence was called, which would be granted permanently on passing the examination referred to. Duly impressed by the sup-

posed difficulty of the coming test, I crammed any amount of theory of electricity and electrical physics, and did some experimenting with my first one-valver built on a small cigar box. I still remember the thrill I experienced, on the first day after this had been completed, on tuning into 495 metres and actually hearing a faint voice from Britain telling me that Aberdeen was calling. Always a distance of 1,400 km. with a one-valve reaction-on-aerial (we experimenters were allowed that) set built on the top of an old cigar box with no other insulation.

If I remember right it was in November, 1924, when the summons came. At 6.30 p.m. I went with shaking legs and beating heart. I thought of the terrible consequences if my licence were not to be confirmed. My set, my very own set, would have to be destroyed! The long room was full. At last somebody came round and distributed two large foolscap sheets containing the three questions and space for answering them. I stared and stared again, three simple questions which everyone having ever handled and built a set with some knowledge of exactly what he was doing could answer. I wrote. I got up. With me another man got up. One of the supervisors came round and gathered in our papers with a raising of the eyebrows: "Finished already?" To this day I cannot forgive myself for not having been quicker and having been the undisputed first to finish.

Days passed in agony. They could not possibly have only meant the short answers I gave. They surely wanted a long treatise on each question, otherwise why the amount of space left? I worried, till at last the pink

(Continued in col. 1, page 816.)

Dominion and Foreign Broadcasting Intelligence

CANADA

(From our Montreal Correspondent)

Reception of the Cenotaph Service

The broadcast of the Service at the Cenotaph was successfully relayed by Beam telephony to Canada and re-broadcast by a chain of stations throughout the Dominion. In addition to being transmitted by all the B.B.C. stations, the details of the ceremony, as they were picked up by the microphones in Whitehall, were carried by Post Office land-line to the short-wave Beam station at Bodmin. Thence they were transmitted to the Beam receiving station at Yamachiche, near Montreal, which in turn passed them on to the broadcasting stations of the Canadian National Railways.

The broadcast was timed to include the whole of the Cenotaph ceremony from 10.15 to 11.10 a.m. and Canadian listeners were able to hear the massed bands of the Guards, how the Prince of Wales placed the wreath on the Cenotaph, the service conducted by the Bishop of London, and the stirring "Reveille" and "God Save the King" which concluded the Empire's tribute. The wavelength employed on the multiplex Beam link across the Atlantic was 16.575 metres. The arrangements for this broadcast relay were similar to those made on Sunday, July 7, for the relay of the Thanksgiving Service in Westminster Abbey, which was broadcast throughout Canada and reported by listeners in all parts of the Dominion to be heard as clearly as a first-class local broadcast.

AUSTRIA

(From our Vienna Correspondent)

"Indian Chief McCallum"

It will interest many abroad who have listened to his voice from the ether to know that Professor McCallum, of Vienna University and radio (English) lessons, was made an "Indian Chief" by the veteran Big Chief White Horse Eagle, after he had translated, sentence by sentence, into German, before a very large audience here, a lecture delivered in English by the Indian, who claims to be 107 years of age.

Two Operas a Month

A number of little-known operas, as well as some universally admired, are to be given in the Ravag studio during the next few months. In November we have Humperdinck's *King's Children* and Hugo Roehr's *Coeur Dame*, and in December Anton Dvorak's *Russalka* and Charles Gounod's *Margarethe*—or *Faust*, as we call it. In January we shall have Rossini's *Barber of Seville* and Julius Bittner's *Musikant*, and in February Wagner's *Nibelung Trilogy*, with others to follow in the spring.

DENMARK

(From our Copenhagen Correspondent)

Announcements in Several Languages

The Danish Broadcasting authorities have received requests from listeners abroad to give announcements in foreign languages. The writers mention that the station of Kalundborg is heard very well outside Denmark, but that they would have greater satisfaction from the transmissions if the announcement could be made in the listener's own language. Those responsible are now considering the question of announcing in English, French, and German.

Celebrated Conductor Visits Copenhagen

On Thursday, November 28, at 7.15 till 9.15 p.m., a concert will be given in the big studio

at Axelborg, Copenhagen, under the conductorship of the Italian *maestro*, Egisto Tango; his wife, Viorica Tango, will be the principal soloist of the evening. The programme will consist entirely of Italian music. Signor Tango is well known in Denmark. He has been the conductor of Italian opera companies which have previously visited Denmark by arrangement with the Danish Broadcasting Company. The last occasion was in the spring, in connection with the Royal Theatre. Through these visits Signor Tango has gained great popularity and a very good Press. He is also engaged by the Royal Theatre to conduct an opera during this season. Signora Tango has performed in several big parts during these visits, and has been acclaimed as an eminent opera-singer.

FRANCE

(From our Paris Correspondent)

Fresh Hope for French Broadcasting

Mr. André Tardieu, the new Prime Minister, evidently intends to develop broadcasting in France, and this is giving great satisfaction, both to listeners and the trade. He has not only appointed M. Germain Martin to be Minister for Posts, Telegraphs and Telephones (Postmaster-General), where he will have an opportunity of proceeding with his popular Broadcasting Bill, but he has made the office one of cabinet rank, and in his ministerial declaration, has announced that he will demand a credit of seventy million francs for the purpose of agricultural broadcasting. Details have not yet been supplied as to how this money will be expended, but it is generally admitted that it can very usefully be applied to this purpose.

Eiffel Tower and 5GB

Daventry 5GB, although strongly subject to fading, is heard very well at Paris in the evenings, but lately many listeners have complained of interference. This appears to come from a station having a slightly higher wavelength, and transmitting the Eiffel Tower programme. It does not come from Paris P.T.T., but is probably a harmonic of the long wave station.

Roman Catholics and Broadcasting

At a recent meeting of prominent clerical and lay Roman Catholics, including the Bishop of Meaux, General Caloni, several Members of Parliament, and Father Lhande (who is so well known for his broadcast sermons), wishes were expressed for a closer collaboration with broadcasting authorities, and for the creation of a committee to report any transmissions contrary to Catholic beliefs.

GERMANY

(From our Berlin Correspondent)

Thomas Mann and the Nobel Prize

On Tuesday evening, November 12, news was received in Berlin from Stockholm that the Nobel Prize for Literature for 1929 had been awarded to Herr Thomas Mann, the author of *Buddenbrooks*, and other well-known novels, and on the same evening the Funk-Stunde was able to broadcast a talk by his brother, Herr Heinrich Mann (also a well-known novelist), on the prizewinner's work and career. Herr Mann is the fifth German to receive the Prize. Other talks on Nobel prizewinners broadcast by the Funk-Stunde this week were by Professor Hans Reichenbach, of Göttingen, on the joint-winners of the 1929 Prize for Chemistry, Dr. Arthur Harden (of London University and

the Lister Institute) and Prof. von Euler, of Stockholm; and on the 1928 and 1929 prizewinners for Physics, Professor Owen Willans Richardson (Yarrow Research Professor of the Royal Society and Director of Research in Physics at King's College, London) and Prince Louis de Broglie, of Paris, respectively. Professor Richardson's fundamental Law on the motion of electrons emanating from hot bodies received special notice from Professor Reichenbach.

Picture Reception Enquiries

The Berlin stations, which, it will be remembered began experimental transmissions of still pictures on the Fulton system shortly after the commencement of similar experiments by the B.B.C., are asking their subscribers to inform them whether they are satisfied with the choice of pictures sent and with the quality of the results obtained. With their replies, subscribers are invited to send good examples of the received pictures. The question is also put whether the receiving apparatus used is of shop or home manufacture.

(From our Munich Correspondent)

Film Stars to Face the Microphone

On Sunday, November 24, the well-known German film stars, Gerda Maurus and Klaus Pohl, will tell Bavarian listeners of their work in the film studios in the interval of the concert beginning at 6 p.m. Gerda Maurus has played the female star rôle in nearly all Fritz Lang's great films. "Spies" will be remembered, also "Metropolis" and the latest, "Frau im Mond."

Broadcast Political "Profiles"

On Monday the 25th Munich and the Bavarian stations will include Mr. Ramsay MacDonald, the British Premier, in the series of "Profiles of European Statesmen," which takes place at 5.45 p.m.

A "Symphony in Words"

On Tuesday, at 8.15 p.m. a symphony in words entitled "Das Wasser: Eine Symphonie" by Dr. Alfons Paquet, will be read by Rudolf Hoch from the Bavarian stations. If I am rightly informed, the original German text of the first part of this symphony in words will be found in the Foreign Languages page of this issue. There are four parts in all, bearing the titles: Die Musik der Ströme (The Music of the Streams), Das Schiff (The Ship), Saum und Schaum (Foam), Das gefangene Meer (The Imprisoned Sea).

HOLLAND

(From our Correspondent at The Hague)

Relay Stations for Huizen?

The Catholic Radio Society (K.R.O.) and Netherlands Christian Radio Society (N.C.R.V.), founders and principal controllers of the Huizen station, have applied to the Minister of Waterstaat for permission to erect a number of local stations in various parts of the country for the purpose of relaying the Huizen programmes. It is proposed to make use of the "Gleichwellen" system of common waves. The reason given for this application is that not only in the distant outlying places, but also in some of the large cities (in the latter case, owing largely to disturbances caused by trams and other electric apparatus), reception is lacking in the necessary strength and clearness.

Viâ Ether

Germany and its Treasures

THE Editor has my sympathy in endeavouring to compress within a few pages matter and pictures which shall give even an idea of some of the sides of German life—so various and so full of interest is that great country, containing as it does many evidences of an abounding commercial revival side by side with witnesses of a more leisurely and gracious age. Who that has seen Frankfurt-on-Main—the city of banking—which combines within its boundaries a city of dignified modern buildings and those wonderful houses of old Frankfurt, can forget it? Or Leipzig—the headquarters in Germany of book publishing and printing—which is at the same time the Mecca of the bibliophile, containing in the University Library an unexampled collection of Goethe books and manuscripts. There, too, is the Buchgewerbehaus, of which more is said below. In that city too, is the Reichsgericht, which is Germany's Supreme Court, and a most imposing building. Memories of Wagner, who was born here, and of J. S. Bach, at one time organist and choir-master in St. Thomas's Church, cling to the city. Then Nürnberg—or Nuremberg, as it is better known in this country—a city associated in the mind of all of us with the picturesque figure of Hans Sachs and the competitions for the distinction of Mastersingers, was also the birthplace of Dürer, the artist. But it is invidious to mention even some of the outstanding points of interest in a few places when space forbids the inclusion of others.

The Birth of Printing.

To Germany belongs the distinction of being, if not the actual birthplace of printing—it is on record that it began in Holland—at least the scene of its earliest nurture. Mainz, Cologne, and Strasburg were beyond doubt the towns in which Gutenberg, Ulrich Zel, and others of that small band of craftsmen laboured with such a future benefit for the world as they little guessed at. Even our own William Caxton learnt his craft in Germany, at Cologne. Yes: I fear that, although most of the revolutionary inventions unquestionably first saw the light in this country, we must acknowledge Germany's claim to that supreme discovery, the art and craft of printing. A wonderful collection of specimens of this early printing, as well as of the products of famous presses down to modern times, is housed in that storehouse of the printed page—the Buchgewerbehaus at Leipzig, of which the Director, Dr. Bockwitz, is writing, in another page, a description which will probably be found to be full of interest.

Campbell and Cologne

THE city and district of Cologne have been fairly fully dealt with recently in this journal, so I will not endeavour to enlarge upon their attractions. But some knowledge of the city impresses upon me the vast change it must have undergone since our poet Campbell wrote of it in these terms:—

In Köln, a town of monks and bones,
And pavements fanged with murderous stones,
And rags and hags and hideous wenches,

I counted two-and-seventy stenches,
All well defined, and several stinks!
Ye Nymphs that reign o'er sewers and sinks!
The river Rhine, it is well known,
Doth wash your city of Cologne;
But tell me, Nymphs! What power divine
Shall henceforth wash the river Rhine?

Certainly, there are in Cologne very many unemployed, but there is little evidence of "rags and hags," and, as for "hideous wenches"—shame!

Another Legend

IN his description of Cologne the writer mentioned the interesting story of the Mayor and the Lion: There is another—probably known to many—of which visible evidence exists to-day. In the Neumarkt stands a new building, a prominent feature of which is the representation of two horses' heads apparently looking out of a window high up on the wall. The story goes that, many hundreds of years ago, a beautiful woman, Richmodis von Aducht, who was the wife of a Bürgermeister of the city, when dying, asked that a diamond necklace which she owned should be left clasped around her neck when she was buried. The request, which was duly fulfilled, was overheard by a rogue, who, at a convenient time, visited the grave with the purpose of possessing himself of the treasure. However, as he was unclasping the necklace the body showed signs of life, which so terrified the miscreant that he fled. The woman emerged both from her trance and her grave, and made her way home. Here she knocked at the door, arousing her husband, who, looking out of a window on the third floor, asked who was there. "It is I, Richmodis, your wife." "Impossible! My wife is dead and was buried." On her protesting that nevertheless it was indeed his wife who stood there, the Bürgermeister declared that he might believe her if his two carriage horses should leave their stable, enter his house, and mount the stairs to the third floor. Of course, hardly had he uttered the words when the pair of horses arrived at the door, entered, and a moment later were both looking down from a window in the third storey. To commemorate the event and the restoration to his bosom of the beautiful Richmodis, her husband caused two horses' heads to be carved in stone in the act of looking through the window. The old house has recently been pulled down; but apparently it was a condition of the lease that the new building should perpetuate the legend in a similar manner.

5GB to Relay "Salome" From Cologne

THE sixth anniversary of Belgium's broadcasting will be celebrated by Radio-Belgique on SUNDAY, November 24, when a special concert will be broadcast by the Brussels station. Another most interesting event is the broadcasting by Budapest on THURSDAY, November 28, at 8.40 p.m. of a talk which is being given, if I am rightly informed, under the auspices of the Society for Foreign Relations—a society which, I am told, conducts its deliberations in the English language. The subject of next Thursday's talk is "History of British-Hungarian Relations." I cannot conclude this note without referring to the broadcasting

by the Werag stations, at 7 p.m. on FRIDAY, November 29, of Richard Strauss's opera *Salome*, which will be relayed by Daventry 5GB for the benefit of listeners in this country.

Rubinstein Centenary

IT is a special pleasure to recall the centenary of the birth of Anton Rubinstein, the great Russian composer and pianist, because he is one of the composers whose works broadcasting has tended to rescue from an undeserved forgetfulness. Among the stations paying homage to Rubinstein's memory on THURSDAY are Budapest, Königswusterhausen, Königsberg, and Cologne. Rubinstein was born on November 28, 1829, at Wechwotynetz, in the Province of Podolia. His parents were Jewish, but, as the result of an Imperial ukase issued against the Jews in 1830, Rubinstein was baptised. At the age of nine he performed in public as a pianist in Moscow, and a year later followed to Paris his old tutor, Alexander Villoing, whom in after years he praised as the best teacher of the pianoforte he had ever known. At eleven years of age Rubinstein played before Franz Liszt. Then began for Rubinstein travels in almost every country of Europe. He paid three visits to England—in 1842, in 1857, and again in 1858. He spent 1872 and 1873 in America, and in 1885, after more concert tours in Russia and elsewhere, began a series of historical concerts, given in most of the European capitals. He died on November 20, 1894. As a rolling stone Rubinstein seems to have done pretty well out of his extensive labours. By his will he endowed a double prize of 5,000 marks (£250) to be presented every five years to the best performer and composer of a pianoforte concerto. He was made a knight of the Prussian Order *pour le mérite* in 1891. He wrote an enormous amount of almost every kind of musical work, and also published several books, including his reminiscences. But it is as one of the greatest pianists who have lived that he is chiefly remembered to-day.

"Noise" and Health.

THE President of the Talking Machine and Radio Men's Association in the United States of America has sent out an appeal urging wireless dealers to refrain from allowing loud speakers to blare discordantly. So far from attracting business, he is of the opinion that it does the reverse. Doubtless he was forestalling the efforts in this direction which are certain to ensue from the newly-appointed New York Health Department, one of the aims of which is the suppression of the more blatant forms of noise-making, such as rivetting work on buildings, the screeching of brakes, and loud speakers, both in the home and in the street. Readers of this paper will be aware that in Austria the perpetration of "unnecessary noise" is a punishable offence, the playing of musical instruments, even in the privacy of the home, after a certain hour, being prohibited. Admittedly, "unnecessary noise" is an elastic term, and may be applied by some listeners to dance music and by others to a talk on the ethics of collecting bus tickets.

ETHERVIATOR.

RADIO REMINISCENCES

(Continued from page 813)

Audionsversuchserlaubnis came back with the note: "Definite, on the ground of the passed examination."

That winter I built many sets. I was always changing. Friends told me that I had become impossible, as all I could talk of was valves, coils, resistances, distant stations—Rome, Königsberg! ("Why, last night I got Madrid on one valve!")

1925 saw the abolition of my treasured pink paper. Unknowing boors (so I thought) were now allowed to build sets if they choose. I was disgusted. I built a highly efficient crystal set, discarding everything else. Then other work and long absences, more important examinations, let me partly forget my enthusiasm. I again became socially possible.

Now and then I would read about new circuits, new gadgets, new stations, more power, better programmes. I smiled. I was past all that.

In October, 1928, I became interested in the programmes again. More sedate, not so "fire and flame," as they say here, I yet went round buying those wonderful new components I had been hearing so much about. The result of my work? A three-valver. Still reaction-on-aerial for my aerial is a rather terribly efficient affair, as I now see, when the local station gets too loud. Next, resistance capacity (formerly unheard of), then transformer-coupled L.F. with a lovely new super-power valve. And, finally, a loud speaker! Personally, I still prefer my old headphones, but my friends prefer the L.S.

First night I logged Chelmsford, this time the S.W. station; then Daventry in full cry; European stations where I wanted. My impressions? Quality seems better. Lots more power with the exception of our own stations that are still the same. Any amount of heterodyne interference. Spark and morse interference practically banished from 200-500 metres. The new components? Really wonderful, but more expensive; valves, again, much cheaper. The same kind of coils we used to have, only wound more efficiently (cylinder coils). Listening, I am sorry to say, as an old experimenter, is now a thing for the masses.

Radio in 1909

It is nearly thirty years since a small band of enthusiasts made a transportable receiver. It was wheeled round the streets on a barrow—there were no motor cars to help.

It was like this. Marquis (then Senatore) Marconi had a mysterious house with a pole on the West Cliff at Bournemouth and was trying to call the Isle of Wight.

If a big man like that could communicate for miles, why should we not try a few yards?

So we started. First efforts—to get a throw of a galvo when a Runkorff coil sparked; we had not much material and no great possessions.

The experiment worked across a table—good luck.

Emboldened we constructed a Branly coherer; spent hours filing steel, nickel and silver; sifting the filings and mixing them in various proportions. Then brass rods had to be cut and filed to fit a glass tube—patience. Patience and bad words when sealing the glass!

But the coherer worked, and this made us arrange our transportable as we were getting beyond our neighbour's gardens. Components: a barrow, bamboo rods, some yards of aerial and earth wire and a spike to stick in the earth; two receivers. Receiver No. 1.—A tapping coherer of the Branly type, and No. 2, a Popoff automatic carbon coherer. The first worked like this. Morse signals worked at home by a 6-inch spark coil, the sparks fattened by Leyden jars and bed-post brass knobs, were received

on our improvised aerial; the oscillations passed to earth through the tube of filings which partially stuck together and conducted a current better. Across the coherer was a relay circuit, as delicate as our crude methods would allow. A few milliamps worked the oracle. The relay operated an electric bell and the back stroke of the hammer whacked the tube and de-cohered the filings—shook them up.

This was a poor arrangement for the spark at the bell contact itself cohered the filings and a mechanical spring tapper had to be arranged. The relay did heaps of things besides ringing a bell—exploded gunpowder, started a motor or anything else that could be started by an electric current. And many a practical joke did we play "at a distance" with this receiver.

The other receiver was a Popoff carbon and steel arrangement and this required no tapping, but would do no tricks except receive morse signals.

It was connected just as the more recent crystal and carried a small current from a couple of dry cells. Buzzing signals were heard in 'phones placed across it.

We had no variable condensers or tuning coils. Even in high places in those days, tuning consisted of tapping a coil of wire on a wood frame.

So we trundled along, erecting the pole in some dark or deserted corner; we were not escaping a Post Office licence, but avoided as far as possible the interference of youngsters. We progressed a little farther from home each trip and reached about a mile with our portable, and became of such importance that we were allowed to visit and photograph an early Marconi station—and spoke in morse twenty miles across the ocean!

The lone operator was glad to receive visitors, but equally glad to come and have refreshment at the nearest country "house." Messages were scarce. When asked about lightning—"atmospherics" were not invented then—he said that when the sparks on the aerial reached more than an inch long he just cleared out. We took all this information in—in those days.

Hanging an aerial out of the window and listening to faint morse was a slow job in 1900.

E. W. POLLARD,

The Quarry, Binstead, I. of W.

Letters to the Editor

Butterflies and Wireless

To the Editor WORLD-RADIO.

SIR,—Somewhere about two years ago was published in a monthly scientific publication (which takes considerable interest in wireless), an article describing observations on moths and their methods of communication, which is of interest in connection with the present discussion in *World-Radio*. A female moth was observed, out in the open, to set her antennæ quivering rapidly, whereupon male moths began to arrive. As soon as one of these mated with the female, her antennæ ceased to quiver and thereupon all the approaching males settled down where they chanced to be and so remained quiescent until, a little later, they all rose and flew off in the same direction, presumably in response to a signal from another female. It was suggested that these signals were a form of "wireless" radiation, and if, as I think was stated, the males had arrived from different directions, it seems difficult to believe that it was in response to scent emanations, as such, in the open air, for scent particles would necessarily be wind borne. Also the scent in the air would scarcely cease the moment the female ceased to emit it.

The article further suggested that the wave frequency of these vibrations is comparable to that of visible light rays, and that this is the

explanation of the attraction of artificial lights for moths and other flying insects. It would be interesting to ascertain whether all the moths fluttering round a candle are male.

As there appears to be evidence for the scent theory, is it not possible that both methods exist, either together or alternatively, or that the scent particles are themselves radio-active? That last suggestion would, I think, bring all the observations into harmony.

Yours truly,

J. V. EDMONDS.

West Kensington, London, W.,

November 6, 1929.

Reception in U.S.A. of S.W. Stations

To the Editor of WORLD-RADIO

SIR,—As a very interested reader and subscriber of your weekly *World-Radio*, it has occurred to me that perhaps some of your readers might be interested in American reception of short-wave broadcasting stations throughout the world, in order to enable them to compare the stations they hear with the ones we receive in America.

Of the European stations, PMI and PCJ of the Philips Company and your own G5SW stand out pre-eminently. For regular week-in and week-out reception PMI is our best-received station. Practically any day they are transmitting we can tune them in right at the start of their transmission at 1,300, and hold them right to the close at 1,600, the signal maintaining evenly strong volume during the complete transmission. This station does not seem to be affected by changes in weather as do the stations on higher waves.

G5SW is excellently received here in the summer months, and also in the late spring and early fall. In the summer the signal strength and all-round performance of G5SW is equally as good as PMI, and this station, during the last two years, has been the source of great enjoyment to many of us in America who greatly enjoy the English programmes. Just at the moment, the programmes I especially remember are the Armistice Day service last year and the bells from St. Martin's-in-the-Field, the very splendid service for His Majesty on the occasion of his recovery, the Schneider Trophy race, and the speech of Mr. Philip Snowden at the "Hague Conference," on the Young Plan. The Piccadilly Hotel, the Ambassador Club, and the Savoy Hotel are all well known to us "over the air." Jay Whidden and his Band, the B.B.C. Dance Orchestra, and Ambrose and his Orchestra and the rest all come to us *via ether*. Big Ben is a familiar "timepiece" in America. In the winter time, and even at this time of year, however, 5SW fades off quite early—around 4 p.m. here we must necessarily miss a large part of the programme. Some days this station remains well up above the noise until 7 p.m.; but these occasions are few and far between at this time of year.

With the Australian stations the writer has had particularly pleasant connection. On several occasions the writer has had the rare privilege of speaking to Mr. P. M. Farmer, engineer of VK2ME, and Mr. MacDonald, the chief engineer of that station, *via W8XX*, the Westinghouse Short Wave Station. 2ME is excellently received in America, and the courtesy of the Amalgamated Wireless Company in sending programmes to KDKA to rebroadcast has been the source of a great deal of pleasure to many Americans. We miss 3LO's Sunday afternoon rebroadcasts; but it looks from *World-Radio* as if we must forego the pleasure of listening to this station.

Yours, etc.,

GEORGE H. MORECROFT, JR.

48, Dawson Avenue, Bellevue, Pittsburg, Pennsylvania, November 4, 1929.

SHORT WAVE STATIONS

The times quoted are reduced to G.M.T.

M.	Kc/s	Station
104.5	2780	Perth (Australia), 6 WF, 0.25 kw.
99	3030	Motala (Sweden). Relays Stockholm irregularly.
80	3750	Constantine (Algeria) 8KR. MON. and FRI.
70	4285	Vienna (OHK2). Transmits on SUN. for 15 minutes after each hour from 5 p.m.
67.65	4434	Döberitz (AFK), 5 kw. MON., WED., and FRI., 10 a.m. to 11 a.m. and 6-7 p.m.
62.5	4800	Pittsburg East (Westinghouse Electric), W8XS. Relays KDKA.
61	4918	Radio LL (France).
58	5172	Prague (Czechoslovakia).
56.7	5291	Nauen (AGI), occasionally after 5 p.m.
52	5759	Bergedorf (Germany) AFL, 3 kw.
50	6000	Moscow RFN. TUES., THURS., and SAT., 12-1 p.m.
50	6000	Barcelona Radio Club EAJJ. SAT., 8 p.m. to 9 p.m. News and gram. rec.
49.83	6020	New York, N.Y. W2XBR. Relays WBNY, 1 kw.
49.5	6060	Cincinnati (Ohio) W8XAL, 0.25 kw. Relays WLW from 11.50 p.m., except FRI. and SAT.
49.5	6060	Council Bluffs (Iowa) W9XU, 0.5 kw. Relays KOIL.
49.4	6072	Vienna (UOR2), 0.4 kw. Testing TUES. and THURS., 12.10-1.10 p.m.; WED. and SAT. after evening programme.
49.34	6080	Newark (N.J.) W2XCX. Relays WOR.
49.02	6120	Richmond Hill, N.Y. (W2XE). Relays WABC Weekdays, 11 p.m. to 5 a.m. SUN., 3.50 p.m. to 5.30 p.m.
49	6123	Motala (Sweden). Relays Stockholm daily.
48.8	6147	Manila (Philippine Islands) KZRM. Daily 8 a.m. to 3 p.m. (except Monday).
44	6818	San Lazaro (Mexico) XCS1, 7 a.m. and 7 p.m.
43.8	6850	Georgetown (British Columbia) KRY
43.8	6881	Coethen (Germany) D4AFF. Testing.
43.5	6896	Rome (Italy) IMA. SUN., 4-6.30 p.m.
43	6976	Madrid EAR 110. TUES. and SAT., from 10.30 p.m. to 12 midnight.
42	7142	Perth (Australia) 6AG, 10.30 a.m. and 3 p.m.
41	7316	Radio Vitus. (Austria).
40.2	7463	Lyons (Rhône) YR. Daily except SUN. from 4.30-5.30 p.m.
40	7500	Döberitz AFK (or DOA). 5-7 p.m. daily; occasionally other times.
37	8108	Vienna (EATH). MON. and THURS., 9.30 p.m.-11 p.m.
34.5	8696	Schenectady W2XAC. (General Elec. Co.) Relays WGY to Byrd Antarctic Expedition.
32.5	9230	Sydney (2BL).
32.5	9230	Paris, Eiffel Tower (FL). Time Signal 8.56 a.m. and 8.56 p.m.
32	9375	Berne (Switzerland) EH90C.
31.8	9434	Posen (Poland), 0.25 kw. TUES., 6.50-9.30 p.m. SAT., 6.25 p.m.-1 a.m.
31.65	9479	Paris Experimental Radio, 2 kw. 9 p.m. weekdays, 3 p.m. on Sundays.
31.6	9494	Lyngby (Denmark) (Experimental).
31.48	9530	Denver (Col.) W0XA. Relays KOA, 0.75 kw.
31.48	9530	Schenectady (General Electric Co.), N.Y. W2XAF, 10 kw. (Aer.). MON., 11 p.m. to 5 a.m. TUES., 11 p.m. to 4.30 a.m. THURS., 11 p.m. to 5.30 a.m. SAT., 11 p.m. to 5 a.m. Relays WGY.
31.4	9554	Hilversum, Holland PCJ, 25 kw. THURS., 7-9 p.m., in English; 12 midnight-1 a.m., in Spanish. FRI., 1-2 a.m., in Portuguese; 2-4 a.m., in Spanish; 7-9 p.m., in English. SAT., 1-2 a.m. in Dutch; 2.5 a.m., in English, French, and Spanish; 5-7 a.m., in English.
31.38	9560	Zeesen (Germany). Relays Königswusterhausen daily from 7 p.m.
31.28	9590	Sydney 2FC.
31.28	9600	Bergen LGN.
31	9677	Nairobi (Kenya) 7LO. Daily, 4-7 p.m. Relays 5SW occasionally from 7-8 p.m.
30.91	9700	New York (W2XAL). TUES., 12 mdnt.-5 a.m. WED., 12 mdnt.-2 a.m. FRI., 12 mdnt.-4 a.m. SAT., 12 mdnt.-3 a.m., 0.5 kw.
30.75	9756	Agen. TUES. and FRI., 9-10.15 p.m.
25.6	11,718	Winnipeg (Canada) CJRX, 2 kw. DAILY (except SUN.), from 10.30 p.m.-12.30 a.m. SAT., 6 a.m.-7 a.m.
25.53	11,751	Chelmsford (5SW), 15 kw. (Aer.). DAILY (except SAT. and SUN.), from 12.30-1.30 p.m., and from 7 p.m.-12 mdnt.
25.1	11,800	Pittsburg East (Westinghouse Electric) W8XK. Relays KDKA from 11 p.m. (TUES. and THURS. 10 p.m.)
24.5	12,240	Manila (Philippine Islands) KIXI. Weekdays, 10.30 a.m. to noon.
23.35	12,850	Oakland (Calif.) W6XN. Relays KGO. TUES., WED., and FRI., from 5.30-9 p.m. (G.M.T.), 5 kw. WED., also 2 a.m. to 8 a.m.
23.35	12,850	Schenectady W2XO. TUES., THURS., and SAT., 5-10 p.m. Relays WGY (Tests).
22.2	13,513	Vienna, 0.24 kw.
20.8	14,428	Pittsburg East (Westinghouse Electric) W8XS. Relays KDKA.
19.53	15,340	Schenectady (General Electric Co.) W2XAD, 6 kw. SUN., 7.30 p.m.-4 a.m. MON., WED., and FRI., 3-5 p.m. and 11 p.m.-5 a.m. SAT., 5 p.m.-5 a.m. Relays WGY.
17.34	17,300	Schenectady (W2XK). MON., WED., and FRI., 5-10 p.m. Relays WGY. (Test.)
17.34	17,441	Nauen (AGC).
16.83	17,769	Huizen (Holland) PHI, 40 kw. Usually transmits from 3-5 p.m.
16.8	17,850	Bandoeng, Java, PLF, 30 kw.
16.3	18,404	Kootwyk (Holland) PCK. From 6 a.m.
15.94	18,820	Bandoeng, Java (Radio Service) PLE. WED., 12.40-2.40 p.m.
15.5	19,351	Nancy (France), 9-10 p.m.
15.02	19,973	Buenos Aires (Monte Grande) LP3.

For Long and Medium Wave Stations see p. 846.

Last Week's Log

By "NORTHERNER"

(November 10 to 16)

SHORT-WAVE work has given indication of a slight improvement so far as reception is concerned, although results are still much below normal. In general, there has been little variation throughout the twelve months on this section of the waveband until recently, and apparently the troubles prophesied as likely to be experienced by reason of sunspots are now materialising. The effect is noticed not so much in static as in intensive fading of such long intervals that, according to my observations, maxima and minima signals occur only a few times daily. This state of affairs appears to be world-wide, and it is always a kind of negative satisfaction to hear a commercial station notify a distant transmitter that his signals have rapidly lost strength, thus confirming one's own observations, and incidentally cancelling the necessity of looking over the set for the cause of the fall in signals.

Most stations from the West have been relatively lower than from the opposite direction. W2XAD was heard at times at fair volume early in the evening, but gradually lost strength. From 11.0 p.m. onwards the station was barely audible on most days, whilst W2XAF was in no better case. W8XK showed less reduction, but was nevertheless below normal volume.

Rather oddly, I heard CJRX at Winnipeg early in the week, at weak strength, but since volume at any time from this transmitter is never great, it is perhaps unfair to use this for comparison on such weak signals.

The period of sunset and sunrise, at either the sending or receiving end, appears to have more effect in damping out signals than any other part of the day and, in addition, the reduction of most signals on, say, 25 metres and downwards from 8.0 p.m. or so, with a corresponding improvement on and above 30 metres, still holds good. Neither the German nor Danish short-wave transmissions at about 31 metres have been at all satisfactory, whilst Hilversum on 31.4 metres was little better. Although it may sound odd, the best signals from any parts have been those from Australia in the early morning, those of the late afternoon being slightly weaker.

I have given rather more space than usual to the subject of short-wave reception, thinking that what I say may be of some little help to those new listeners who may be worried by the uncertainty of signals on these high frequencies, and who, most probably and very naturally, are blaming their receiving equipment, from aerial to bias battery. Actually, one can only be patient and hope for improved circumstances. It certainly is the case that one dare not at present invite anyone interested to come along any evening and listen to, say, lunch-time music from New York, with any hope of succeeding. Yet, throughout the summer and up to the recent break-up, it was possible to do so on at least five days per week.

The medium waves show conditions very similar to those I last reported. Transmissions can be heard in great numbers, but the heterodyne situation is rather worse; evidently signals are actually rather stronger. Probably one of the most trying interferences is that noted on 5GB—Langenberg. The very high-pitched whistle does not really spoil the programme, but its presence is noticeable on either station and is an unfortunate irritation.

There is very bad interference in the neighbourhood of Dublin and Katowice; both these transmissions are so powerful that it is not easy to identify which station or stations are causing the trouble. The section from London

(Continued in column 3)

Heard on the Continent

By "CENTRAL EUROPEAN"

ATMOSPHERIC conditions are improving day by day, and European listeners, in consequence, are taking a growing interest in the reception of distant stations. One is pleased to be able to state that during the last few weeks it has become so good that almost every European transmitter of average strength can be heard.

When speaking of reception of distant stations during the last few weeks, special mention must be made of the Swedish transmitters, which have been received, even in the most distant parts, with greatly increased strength. Some of the bigger transmitters—Göteborg and Hörby, for instance—are so powerful that they interfere with the reception of Breslau and Leipzig at a point much nearer to the latter stations. Owing to the excellent atmospheric conditions the range of such Eastern European transmitters as Tallinn, Riga, Leningrad, and Helsingfors, which up till now have been heard very little in Central Europe, has increased considerably. It is interesting to note, by the way, how similar is the musical part of the programmes of these four northern stations. All distant listeners in Central Europe know how well the Hungarian transmitter, Budapest, is heard. An item which has figured in its programme during the last few weeks deserves special mention. It is entitled "World-Journey by Radio" and takes the form of a relay of foreign programmes, but instead of rebroadcasting other prominent stations, Budapest has taken a rather novel line by relaying stations whose programmes have an exotic flavour. For instance, Stamboul was relayed—and very powerfully it came through—and a programme of Turkish music, which was quite unknown to European listeners, was transmitted. On another occasion it was the Moroccan station Casablanca, and we heard a programme of North African music—music which had probably been heard by very few listeners before. Finally there was a relay from New York.

One other phenomenon is worth mentioning. Many listeners may have noticed the unusually powerful transmission of a number of Russian stations during the evening of November 7. Moscow's transmission, for instance, was so powerful that the reception of Königswusterhausen was considerably interfered with even for Berlin listeners.

LAST WEEK'S LOG

(Continued from previous column)

to Frankfurt encloses so many transmissions, all heard at good volume in this country, that one feels high appreciation for those in responsible control, for the very slightest deviation would produce chaos out of what is really, under the circumstances, a remarkably good and stable situation, with very little actual heterodyne.

Fading, below 300 metres, has been a little less pronounced, and stations such as Turin, Moravska-Ostrava, Hörby, Leipzig, Nürnberg, and others come in exceptionally well. The last is scarcely as good as in the past, but Kaiserslautern provides the same programme (relayed from Munich), very satisfactorily, and strangely enough, without audible interference from the three Swedish relays which share the same wavelength. Without doubt the most remarkable "common" wavelength is 288.5 metres, accommodating eleven stations. The singleness of control (they are all B.B.C. transmitters) obviously simplifies the problem to some extent, but results are certainly of very much higher standard than those from other "common" wavelengths.

Foreign Languages

Aids to Listening

GERMAN

The following is the text of the first part of a "symphony of words" written by Dr. Alfons Paquet, the whole of which will be broadcast by Munich and its relays on Tuesday, November 26, at 8.15 p.m.

DAS WASSER.

Eine Symphonie in Worten
von Alfons Paquet

(1.) Die Musik der Ströme

MAN braucht nicht erst an Smetana's "Moldau zu denken, um die Musik einer Landschaft zu vernehmen, deren Seele und Laune das Wasser ist. Jeder Strom gehört seinem Lande als das bleibende, ewig vergängliche Werk der drei grossen Mächte: Himmel—Erde—Mensch. Hier ist nichts Totes. Und das Erkennen der Lebensmacht des Wassers ist nicht nur ein Feld der nüchternen zahlenmässigen Wissenschaft. An den Strömen leben die Schicksalskräfte und werden zu Lied und Sinfonie. Rhein und Donau schufen sich ihre majestätischen Landschaftsräume. Ihr Höhen des Wiener Waldes mit dem Blick auf die Donau in der Ferne, dazu der Hörnerklang, die flötenden Freiluftgespräche der Vögel. Ganz fern vor dem blauen kühlen Himmel stehen die Alpen im silbernen Schnee. Auf dem fernen Strom gleiten die Boote mit ausgestreckten Rudern. Der Strom verdämmert in der Ebene hin zu den waldigen und sumpfigen Ufern Ungarns. Da liegen die alten grauen Schiffsmühlen, da baden die falben Rinder, weisse Hemdsärmel blinken aus den Maisfeldern, auf dem weissen Radkasten des Dampfers, in der frischen Morgenluft stehen Zigeuner, braun wie Inder und stimmen ihre Instrumente. Sie stehen mit dem Rücken zur Sonne, die Köpfe niedergebeugt auf die im Sonnenlicht flimmernde Geige und spielen mit hinreissender eifriger Armbeugung. Vom Lande kaum noch eingefasst ist der Strom wie die Flut auf einer bis zum Rand gefüllten Schale.

Wir fahren auf dem Rhein, wir hören beim Einschlafen in der Kabine die leisen Klaviertöne der Wellen an der Schiffswand—klingendes Pianissimo. Das ist ganz anders als das schwere Brunnengeräusch des Meeres. Hier ist noch nirgends die harte ozeanische Gewalt. Klänge des Landes schweben von den Ufern. Die Züge, die des Nachts in der schwarzen Bergschlucht als glimmende Stäbe vorüberschweben, zeigen auch die Richtung der langsamen, stillen Kähne, der scharrenden plätschernden Dampfer, der dorfnähnlichen Flösse. Oft schauen die Reisenden im Abteil das dreifache Ineinandergleiten von Rheinlandschaft und vorüberbrausenden Gegenzügen. Das Spiel der Läutewerke, das Rollen der Güterzüge füllt das Ohr des Tales, sie brandet zu den Burgen auf, deren schwarze Zinken unterm bräunlichen Pfauenauge des Mondes Schatten werfen. Die Schleppdampfer mit der ausgebildeten Sprache ihrer Dampfpfeifen, ihrer Schiffsglocken und ihrer Flaggensignale, das sind die Fuhrwerke des Wasserweges. Eine Kirmes, Sommers in einer Dorfstrasse am Ufer, mit den Tonwirbeln der Karusselle und der Dampfpfeifen, des Blechorchesters in der Allee, dem ungeduldigen Klingeln der Fähren, den vorüberbrausenden Zügen, dem Warnungsgeschrei der Autos, dem Gejohl der zwanzigjährigen Menschen, das ist eine Musik, die in der ganzen Welt nur am Mittelrhein möglich ist. Danach die beruhigende träumerische Ruhe des Abends, das siebenfältige Echo des Waldhorns aus den Tälern.

An den grossen Strömen ist nicht nur die angewandte Musik zu Hause, nicht nur das Singen der Soprane, das blinkende Lied. Kriegsgefangene Russen begrüsst einst den Rhein, die grosse Marine vor Walluf mit Chorgesängen. Sie gedachten des Dnjepr oder der Kama. Für das Volk sind seine Ströme

der Gegenstand einer leidenschaftlichen Liebe, der Inhalt seines Lebenswillens. Doch der Strom selber in seinem fließenden ungerührten Dasein ist die Mahnung zur Gelassenheit, zur Geduld, zur Besinnung. So gleichen die Wirkungen des Stromes immer wieder der Musik, zu der wir uns hinwenden aus einer Wirklichkeit, die uns wie ein stetes Streben erscheint, zur höheren Wirklichkeit des unbegrenzten Lebens.

In der Musik des Rheins sind die Stimmen des Heldentums, die Stimmen des Geheimnisses, die Stimmen der Phantasie. Dieser grosse Dreiklang führt uns gleichsam zur Person des Stromes, der erst unser wird durch die lebendigen Gefühle, die er weckt, die Nation ist eins mit ihm, wie mit ihrem eigenen Sinnbild; sie findet sich zu ihm hin in allen Augenblicken der Ergriffenheit wie zu einem Vater, der um alles weiss, was das Schicksal über seine Kinder verhängt.

Beethovens Heimat ist der Ort, wo die Anmut der Sieben Berge in die Ebene übergeht. Der Generalbass, die Religion und ein Strom in seiner Landschaft, das sind in sich abgeschlossene Dinge, über die man nicht disputieren kann. Grosse Musik gleicht den Lebenswasserströmen, deren Ufer immer bleiben, auch wenn sie den Ausdruck wechseln. Dieser Ausdruck ist immer Menschennähe, so sehr auch der Strom das Alltagswerk der Menschen bei Seite lässt und sich dem grösseren Alltag der Natur verbindet. Erst das Meer in seiner grenzenlosen Oede ist ungestaltbar, es ist das Weltende aller Ströme. Wolken steigen auf und schweigen. Der Regen rieselt. Doch der Weg der Ströme durch das Land ist rauschende Musik.

ITALIAN

L'estate di San Martino

SI chiama così perchè verso l'undici novembre, che è il giorno della festa di San Martino, si dice che ci sia sempre un rialzo di temperatura, quasi come se l'anno morente tentasse di ribellarsi al torpore invernale che sta per impossessarsi di lui, e facesse uno sforzo per scuoterselo di dosso; e in tale sforzo un po' del suo vigore passato tornasse a riscaldargli le membra (*notice this irregular plural*) e trasparisse in un ultimo stanco sorriso della Natura. Ed è realmente un fatto che non sono infrequenti in questi giorni le interruzioni delle piogge autunnali, e che la Natura sa ancora farsi bella nella calda varietà delle sue tinte rossastre e nella gloria dei suoi tramonti fiammeggianti.

Ma quest'estate tardiva è breve; e ben dicono i Milanesi col loro proverbio: "San Martino dura tre giorni e un pocolino." Perchè infatti presto ritornan le nebbie, e quelle pioggioline uggiose che non vogliono mai cessare, oppure quei ventacci improvvisi e impetuosi, le cui raffiche (*squalls*) sembra che debbano sradicare gli alberi e scoperchiare le case.

La nebbia a gl'irti colli

Piovigginando sale,

E sotto il maestrale

Urla e biancheggia il mar. . . .

Son versi del Carducci (1835-1907). Comincia così una sua poesia, breve ma molto bella, intitolata appunto "San Martino." È un bozzetto (*sketch*): la descrizione d'un borgo italiano nei giorni in cui l'estate non è del tutto morta e l'inverno non regna ancora del tutto incontrastato. Il poeta coglie la Natura in questo suo periodo di transizione: il periodo delle lievi sfumature (*shades*): sfumature di colori, sfumature di sentimenti. Anche di sentimenti: perchè difatti a questo tempo dell'anno corrisponde in noi uomini un vero e proprio "stato d'animo," uno stato d'animo tanto più suggestivo quanto più esso è vago e indefinito.

Ma sentiamo come continua il Carducci:

Ma per le vie del borgo

Dal ribollir de' tini

Va l'aspro odor de i vini

L'anime a rallegrar.

"L'odor de i vini." Chi non sa, infatti, che l'estate di San Martino è l'epoca della svinatura (*drawing off of the new wine*), il tempo cioè in cui si leva il vino dai tini? E la forte fragranza del vino nuovo si spande dappertutto, e dalle cantine sale su nelle case ed esce per le strade e riempie di sé tutte il villaggio. E per questa ragione che un altro proverbio (ma questa volta è toscano) dice: "A San Martino ogni mosto (*must*) e vino."

Diciamo ora qualche parola intorno al Santo, che è un'amabile personificazione di carità e di coraggioso zelo cristiano.

Nacque in Pannonia verso il 316. Si fece dapprima soldato, ed a questo periodo della sua gioventù rimonta il fatto forse più noto della sua vita. Si trovava allora ad Amiens; e vedendo un giorno un mendico, quasi ignudo, e tremante di freddo, alla porta di quella città, raccontasi che egli, fermato il cavallo, e smontatone, si tolse di sulle spalle la clamide (*chlamys*, a soldier's cloak), la divise in due parti con la spada, e ne diede una metà all'assiderato pezzente. I camerati che, sorpresi, assistevano alla scena, lo beffarono a lungo. Era il suo gesto—dicevano—davvero degno d'un forte soldato, o non piuttosto d'una sentimentale femminuccia? Ma Martino sopportò sorridendo i loro dileggi (*scoffing*). La notte, poi, appena s'addormentò, gli apparve in sogno Cristo, che lo lodò molto della sua buona azione. Quel fatto, e il sogno che lo seguì, influirono potentemente su di lui. Martino lasciò poco dopo l'esercito, e, battezzatosi Cristiano, si diede con entusiasmo a predicare il nuovo verbo divino.

Le sue opere doverono essere molte e grandi, poichè gli ottennero la nomina a vescovo di Tours. Morì nel 400, più che ottantenne, dopo aver compiuto molte buone azioni e, naturalmente, moltissimi miracoli. Fra questi mi piace di ricordarne uno, perchè, come si vedrà, si adatta bene a quel che abbiamo detto più su.

Si racconta dunque che, una volta che San Martino diceva la messa all'aperto (*in the open air*), arrivato al momento della consacrazione, si accorse, con suo grande sgomento, che gli mancava il vino (il quale, come si sa, è di rito in questo punto della funzione religiosa). San Martino, che non voleva interrompere la santa messa, rivolse attorno lo sguardo, come se attendesse dal Cielo un aiuto in tanto frangente (*predicament*). Per fortuna accanto a lui pendeva un tralcio (*vine-branch*) di vite; era però ancora nudo, perchè l'estate non era ancora arrivata. Ma ecco che ad un tratto, con infinita gioia del Santo ed immenso stupore dei fedeli, spuntò sul nudo tralcio un bel grappolino (*tiny bunch*) d'uva. Era piccolino: ma in pochi istanti crebbe e si gonfiò, e di verde che era si tinte d'un bel colore d'ambra dorata. Cosicchè San Martino non dove far altro che coglierne qualche acino (*grape*) e spremere il succo necessario per la continuazione del santo sacrificio.

S. BREGLIA

ESPERANTO

The following is a list of some Esperanto transmissions during the forthcoming week:—

Sunday, November 24.

7.30 a.m. Langenberg, etc.

9.40 a.m. Hilversum.

Monday.

7.15 p.m. Brussels.

Tuesday.

8.0 p.m. Turin.

Wednesday.

6.45 p.m. Vienna.

Friday.

5.5 p.m. Leipzig.

Saturday.

5.10 p.m. Breslau.

The pleasures of "Radio" are greatly increased when, as a result of the new Pelman method, you are able to listen to programmes in foreign languages broadcast from Continental stations.



HOW EVERYONE CAN LEARN A FOREIGN LANGUAGE.

PELMAN INSTITUTE'S AMAZING DISCOVERY.

Can you read Spanish?
No.
Do you know any German?
No.
Here are two books, one printed in Spanish, the other in German.
Yes.
Can you read them?
Of course not.
Well, try and see.
An Hour Later.

Miraculous! I can read and understand every word.

THE above conversation is typical of the experiences of the thousands of men and women who are now learning French, German, Spanish, and Italian by the new Pelman method.

A Business Man, for example, visits the Languages Department of the famous Pelman Institute. He is a very poor linguist. He knows a little French, but not much. He doesn't know a single word of Spanish, German or Italian. Yet, when handed a book printed entirely in Spanish and another printed in German (neither containing a word of English), he is able to read them through correctly and to understand every word.

Needless to say, such a visitor is immensely impressed and at once enrolls for the Pelman Course in the particular language in which he is interested.

Still more numerous are those who write to the Institute for particulars of the method and receive in return a *free first lesson* in Italian, Spanish, German, or French. There are no English words in this lesson, yet to their surprise they are able to read it through without a mistake. They, too, decide to enrol and soon become enthusiastic admirers and advocates of the new Pelman method.

Revolutionising Language Teaching.

This method enables you to learn French in French, German in German, Italian in Italian, and Spanish in Spanish, thus avoiding all translation from one language into another.

It enables you to *think* in the particular language you are learning.

It enables you to learn a Foreign Language without spending months in a preliminary struggle with a mass of dull and difficult grammatical rules and exceptions. It introduces you to the language itself

straight away and you pick up the grammar almost unconsciously as you go along.

It enables you to dispense with the labour of memorising by heart (parrot-fashion) long vocabularies of foreign words. By this method you learn the words you need by actually using them so that they stay in your mind without effort.

Reading Foreign Literature.

It enables you to write and talk in a Foreign tongue, to read Foreign newspapers and magazines, and to enjoy the masterpieces of French, German, Italian and Spanish literature, many of which have never been translated and all of which (especially in the case of Poetry) lose much of their charm in an English version.

General Sir Aylmer Haldane, G.C.M.G., K.C.B., D.S.O., writes:—

"The Pelman method is the best way of learning French without a teacher."

A Naval Commander writes:—

"I may say that I learnt Spanish by your method, and am convinced that it is the best in the world."

There are no classes to attend. The new method enables you to learn a Foreign Language in your spare time, and in from one-third to one-half the usual period.

Here are a few typical examples of letters received from readers who have adopted this new method of learning French, Spanish, Italian and German:—

"I have been in Italy for several weeks. I should like to take this opportunity of telling you what a great help the Course has been to me."
(I.H. 125.)

"I have been working hard at the Matriculation subjects. I got through in French. Had it not been for your Course I would not have been able to have done it all."
(P. 1056.)

"I cannot find adequate words to express my appreciation of the splendid tuition you have given me during Part I of the Course of German. I should always recommend your method to anyone who wished to gain a knowledge of a foreign language quickly and thoroughly."
(G.A. 150.)

"The Spanish I know is entirely due to the Course and not to what I have 'picked up,' which, I find, is nothing at all, though I have been in this country (Peru) a year. My friends express surprise at my good pronunciation; this is due entirely to the little 'Guide to Pronunciation' which is the simplest and most accurate thing of its kind."
(S.K. 108.)

"I have been several times congratulated on my knowledge of German and for having learnt it so well in such a short time. All credit is due to your wonderful course."
(G.P. 185.)

"In three months I have already learnt more Italian than I should have learnt in many years of study in the usual way. What astonishes me is that one can learn so well without using a single word of English."
(I.M. 124.)

"I cannot speak too highly of your (Spanish) Course; my little daughter of twelve really enjoys it, and looks forward with the keenest interest to the return of the work-sheets. To a mother teaching her child alone, the Courses are invaluable."
(S.P. 130.)

"I have been successful in passing the French papers in the Associate Membership examination of the Institute of Mechanical Engineers. I had failed twice before under other tuition and had almost lost hope until, on a recommendation, I decided to take Part II of your Course. After the first two lessons I knew I should succeed at last. I think the great secret of your system is the simple manner in which the verbs are put before the student. The verbs have always been a great difficulty to me, for I have spent hours learning each verb off by heart, only to get terribly mixed up in the examination room—but in this last examination I was surprised at the ease with which they came to me."
(C. 1433.)

In fact, everyone who has followed it is delighted with the ease, simplicity, interesting nature, and masterly character of the new Pelman method.

Write For Free Book To-Day.

This new method of learning languages is explained in a little book entitled "The Gift of Tongues." There are four editions of this book, one for each language. The first explains the Pelman method of learning French; the second explains the Pelman method of learning German; the third explains the Pelman method of learning Spanish; the fourth explains the Pelman method of learning Italian.



You can have a free copy of any one of these by writing for it to-day to the Pelman Institute (Languages Dept.), 87, Pelman House, Bloomsbury Street, London, W.C.1.

State which book you want and a copy will be sent you by return, gratis and post free.

APPLICATION FORM.

TO THE PELMAN INSTITUTE
(Languages Dept.),
87, Pelman House, Bloomsbury Street,
London, W.C.1.

Please send me a free copy of "The Gift of Tongues," explaining the new Pelman method of learning

FRENCH,
SPANISH,
GERMAN,
ITALIAN, } Cross out three of these.

without using English.

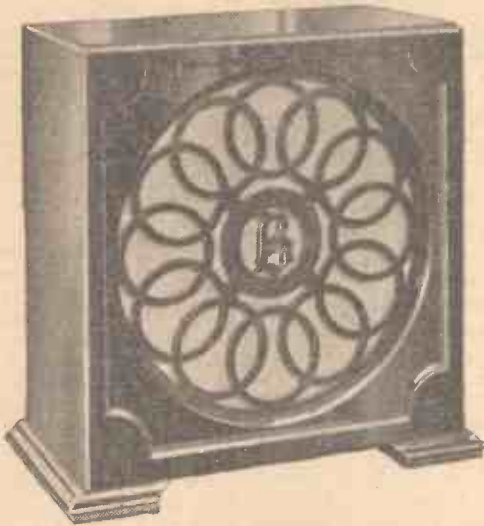
NAME.....

ADDRESS.....

Overseas Branches: PARIS: 35, Rue Boissy d'Anglais. NEW YORK: 71, West 45th Street. MELBOURNE: 396, Flinders Lane. DUBAN: Natal Bank Chambers. DELHI: 10, Alipore Road.

A NEW Loud Speaker principle—

*gives
amazing
results!*



*In 3 models: V10, £5 10s. Od.;
V12, £7 10s. Od.; V15,
£12 10s. Od. All obtainable on
easy monthly payments.*

THE instant success of the new Brown Duplex Loud Speakers which give such amazing clear reproduction is entirely due to the new Brown "Vee" Reed combined with the extraordinary Brown Duplex Diaphragm. Only in Brown Duplex Loud Speakers are these revolutionary features to be found. They are the patented invention of Mr. S. G. Brown, F.R.S., who is known throughout the world as the maker of the first Wireless Loud Speaker.

The Brown Receiver, illustrated here, is highly recommended for use with any of the Brown Duplex Loud Speakers. It is made in two models—for A.C. or D.C. mains* or battery operation—and gives truly wonderful results. Anyone can operate it, and get as many as 41 home and foreign stations in an hour. No coil changing is necessary—the Brown Dual-wave Coils cover all wavelengths. No better combination than the Brown Receiver and a Duplex Loud Speaker can be bought at any price. Ask your dealer to let you hear for yourself.

*In case of D.C. Mains where humming is prevalent, a special Smoothing Filter can be provided.

Factory-built and tested. For Battery operation: £9 7s. 6d. For Mains operation: £17 10s. Also supplied in Kit form, for home building, at slightly lower prices. All models obtainable by instalments.

FREE!

Write for FREE illustrated Folders, to Dept. "M.M.," S. G. BROWN, Ltd., Western Avenue, North Acton, London, W.3.



Brown

CA 2252

Don't forget—



**464 PAGES
130 PHOTOGRAPHS
30 DRAWINGS
TECHNICAL SECTION
CHARTS**

2/6
NET

**THE
B.B.C.
YEAR BOOK**

On sale at all Newsagents, Book-sellers, and Bookstalls, or by post 2/6 from the Publishers, George Newnes, Ltd., 8-11, Southampton Street, Strand, London, W.C. 2.

AN IDEAL CHRISTMAS GIFT

TECHNICAL SECTION

Interference from Power Cables

An investigation of the influence of high-voltage overhead electrical transmission lines upon wireless reception

By R. L. SMITH-ROSE, D.Sc., Ph.D., A.M.I.E.E.

THE Electricity (Supply) Act, 1926, authorised the creation of the Central Electricity Board, to which was entrusted the construction of transmission lines and transforming stations required for interconnecting the power stations selected for supplying the national requirements of electrical energy and for providing supplies to undertakings which have no power stations. The function of the overhead distribution line system is to enable large bulks of power to be transmitted from sources of energy to remote consuming points, so permitting the generation and supply of electrical power to take place on the most efficient scale. The scheme laid down for the complete system in Great Britain comprises about 2,600 miles of overhead transmission line carrying three-phase alternating current at 132,000 volts between phases. This line has become popularly known as the "grid" in electrical engineering circles, and will be formed of a number of stranded steel-cored aluminium conductors supported on steel towers about 80 feet high.

The possible effect of such a transmission line system upon the scenic properties of the countryside has already been the subject of comment in certain districts; and upon further consideration of the matter it is natural to inquire what possible effects this "grid" may have upon the reception of broadcasting programmes. Among the possible interfering effects which the overhead line system might cause in wireless reception are the absorption of energy from the electromagnetic waves by long spans of the line, and also the possible creation of interfering noises on a wireless receiver due to surges in the line, leakage over wet or dirty insulators, and arc or spark discharges either between the "live" lines or from the line to earth *via* the ground wire or steel towers. The present article gives the results of a brief investigation of existing knowledge on this matter, together with the results of some experiments which have been made to ascertain the order of the interference which is experienced in the proximity of a high-voltage discharge.

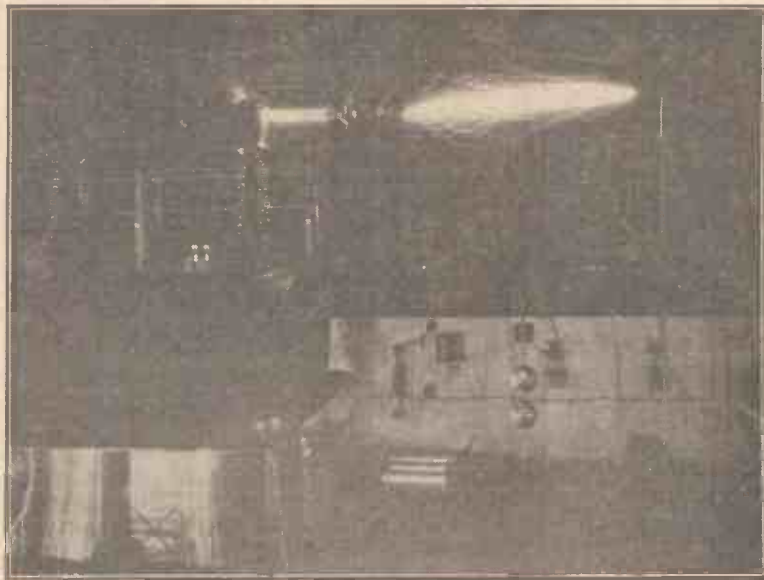
Effects Previously Experienced

In the first place, extended research into the propagation of radio waves over the country leads to the conclusion that there is little, if any, absorption of the energy of the waves by long overhead line networks, such as trunk telephone lines. In the measurement of the signal intensities of radio waves it is sometimes observed that abnormally high values are obtained in the immediate proximity of trunk telephone lines, but these signals decrease to their normal value at a distance of less than 100 yards from the line. Other experiments carried out with portable wireless direction-finders also lead to the conclusion that at a distance of one or two hundred yards from a long overhead line there is no interference due to the existence of the line.

An overhead transmission line carrying power under normal conditions would not be expected to cause interference at a wireless receiving station to a much greater extent than is already experienced from underground cables. The currents are of the same order in the two cases,

and at the low-frequency of fifty cycles per second the effect of an induction field operating on a receiving antenna would be negligible except at very short distances (probably less than fifty yards) from the line.

For similar reasons low-frequency earth currents would not cause any appreciable interference on a wireless receiving system. It may, therefore, be considered that any interference from the line under power would be limited to the occurrence of surges and spark or arc discharges. A search through the literature shows that little work has been carried out on the effect of such disturbances on a wireless receiver, although considerable attention has been given to disturbances caused to land-line telegraph and telephone systems. Since it is a frequent practice to use an overhead transmission line for radio-frequency carrier current telephonic communication, particularly at times when the land-line system has failed, it would appear that the disturbances at radio-frequencies are not very serious.



High-voltage Testing Apparatus maintaining a million-volt arc

A few brief investigations into the radio interference caused in the neighbourhood of a high-voltage distribution system have been carried out in America. In one case several tests were made directly beneath transmission lines up to 220,000 volts with a receiver properly shielded from low-frequency inductive effects. Provided that the voltage of the line did not greatly exceed the corona point, radio reception was quite free from interference over a range of wavelengths from 100 to 25,000 metres, even when the antenna was placed parallel to and seventeen feet from one of the 220,000-volt lines. In another case it was found that discharges over wet insulators on a 50,000 to 100,000-volt line may cause buzzes or crashing sounds in broadcast receivers within 200 feet from the line.

A brief account of some experience of the interference caused by high-power overhead transmission lines on broadcasting receivers in

Canada has also been recently published by the Radio Department of the Ministry of Marine Fisheries, Ottawa. It was found that the interference was chiefly due to faulty contacts either in the lines themselves or in apparatus connected thereto. Out of some 5,000 cases of alleged interference investigated, 80 per cent. were due to power lines and 90 per cent. were definitely cured after tracing the cause of disturbance.

A more recent paper published in the Journal of the American Institute of Electrical Engineers draws attention to the interference caused by corona and brush discharges taking place between porcelain insulators and the metal pins and wires attached to them. Considerable reduction of this interference was effected by improving the contact between the metal and porcelain parts of the insulators on a 55,000-volt transmission line. Some measurements made in connection with this work showed that the interference resulting from the above types of discharge decreased to an almost negligible value at distances of from a quarter to half a mile from the line.

Tramway Systems

Before leaving this section it will be as well to recall the fact that the interference to wireless reception caused by electric tramway systems has been investigated in Germany, and some interesting results have been published recently. In

confirmation of previous experience it was found that the interference was worse with small than with large currents; in fact, some oscillograph records showed that with currents in excess of half an ampere the disturbance was negligible, whereas with currents of the order of thirty milliamperes the interference was serious and could be detected at distances of more than two miles from the line. The experiments supported the view that the trouble is due to damped oscillations set up by the interruption of the steady current passing from the overhead wire to the contact wheel of the car. Tests made with different contact materials showed that carbon and zinc rubbing on copper were superior to other metals. The paper referred to above also contains a discussion of the use of condensers and chokes in the car lighting and power circuits with the object of reducing to a minimum the high-frequency disturbance for this particular case.

From the available information as summarised above, it may be fairly definitely concluded that at a wireless receiving station situated outside a minimum distance of the order of half a mile from a high-voltage overhead distribution line, no interfering or disturbing effects will be experienced due to the existence of the line or the current which it is carrying. It appears, however, that if leakage of electric current occurs over wet or dirty insulators from the line to earth, and if spark discharges occur at any point then some interference may be set up in wireless receivers in the vicinity.

(To be concluded.)

The ELLISON LEADS AGAIN WITH THREE NEW H. T. MAINS UNITS

**P.2. FITS INSIDE YOUR
PORTABLE - £4-17-6**

**A.C.1. 20m.a. DETECTOR
AND POWER TAPPINGS
£3-15-0**

**A.C.2. 30m.a. DETECTOR,
VARIABLE SCREENED
GRID, AND POWER
TAPPINGS, FULL WAVE
RECTIFICATION £4-10-0**

ELLISON MFG. CO., LTD.
DRAGON WORKS,
HARROGATE.

Illustrated Catalogue
Free on Request.

*More Revelations
by Wireless!*

In response to the widespread demand from "listeners-in," the Revelation Suitcase Company have decided to continue their Sunday Evening Programmes of Light Music until Christmas. The "Revelation Hour" is broadcast every Sunday from Radio-Paris (1,725 m.) at 10.15 p.m. There will be competitions again . . . with more prizes! Don't forget. Sunday evening 10.15 to 11.15 p.m. Listen for the theme song "Pack up your Troubles."



Zeesen Short Wave Transmitter

DESIGNED for the purpose of world-wide broadcasting, the new short-wave transmitter at Zeesen has recently completed a series of experimental transmissions extending over several weeks, and is now operating on a regular schedule, relaying the Königswusterhausen programmes from seven o'clock each evening. The apparatus of the new station is actually accommodated in the same building as the Königswusterhausen long-wave transmitter, and the aerial employed, a single wire approximately 55 metres in length, is attached to one of the existing masts which support the larger aerial.

Like the apparatus of the long-wave station, the new transmitter was constructed by the Telefunken Company, and is very similar in general design to the powerful short-wave stations recently built at Nauen and Buenos Aires, by means of which telegraph, telephone, and picture transmission services are maintained between Germany and the Argentine. The power rating of the new station—i.e., the power in the aerial when the transmitter is operating, but no modulation applied to the carrier wave—is 8 kilowatts, and the normal wavelength is 31.38 metres.

Arrangement of Apparatus

The transmitter comprises seven stages, the crystal control of oscillation frequency being applied to the first stage. The desired short wave is obtained by selecting a harmonic of the crystal frequency—which, for practical reasons affecting the reliability and life of the crystal, is lower than that corresponding to a wavelength of 31.38 metres—and amplifying and filtering the selected harmonic frequency in succeeding stages until the desired wavelength as well as the required power are eventually reached. Naturally, the valves used are of increasing power-handling capacity in progressive stages, from the ordinary type of power amplifying valve in the first stage to two 1,500-watt power valves in parallel in the fifth and sixth stages, at which latter point modulation is applied via three power valves operated in parallel. The seventh, and final, stage consists of two 20-kilowatt water-cooled valves connected for "push-pull" amplification.

Power Supply

The various types of valves employed necessitate different supply voltages. Power is obtained, initially, from the main station transformer, which is fed from outside power mains. The two water-cooled valves in the last stage are fed with anode current at 10,000 volts, generated by a high-tension, direct-current dynamo of 50-kilowatt capacity. Anode current for the valves in the fifth and sixth stages is supplied by a 4,000-volt, 5 kilowatt machine, while the remaining stages, with the exception of the crystal-controlled oscillator, which has its own 220-volt, direct-current generator, are supplied from yet another direct-current dynamo at 2,000 volts, the power rating of this machine being 2 kilowatts.

For filament heating there are provided two separate dynamos; one giving up to 5 kilowatts at 40 volts, and the other giving 2 kilowatts at 20 volts. In addition a special machine is provided for the filament heating of the modulator valves. Grid bias voltage for the two large output valves (seventh stage) is obtained from a special 750-volt, 2-kilowatt converter.

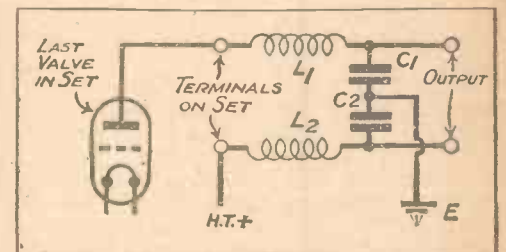
Control arrangements throughout the station are of the most modern type; all the generators mentioned are started by means of push-buttons on a central switchboard which is situated in the basement of the station building.

Hand Capacity in Short Wave Receivers

ONE of the most annoying things, to anyone who has just built his first short wave receiver, is hand capacity. This occurs as the result of so many variable factors that it is impossible to lay down any hard and fast rules for means of abolishing it. Nevertheless, it is generally correct to assume that it is caused by the aerial tuning and reaction control condensers. Of course, it is absolutely essential to see that the spindles of these two condensers are earthed. But that alone will not always eliminate the trouble. The older type of condenser had the spindle insulated from the end-plates and, as the spindle and dial had to be earthed, the end-plates were connected to the high-potential end of the circuit and so, bringing the hands near the panel (i.e. one of the end-plates) hand capacity effects were clearly evident.

In the reverse case, if the end-plates were earthed, hand capacity was almost as bad owing to the spindle not being earthed this time. So there was no avoiding the trouble however the condenser was connected. The newer designs of condensers have the spindle and end-plates electrically connected and the fixed plates are thus inside the two end-plates and effectively shielded. Hand capacity effects, therefore, will be minimised by just making sure that the spindle is earthed.

In many cases a metal shield placed immediately behind the panel will completely abolish these undesirable effects. Any non-magnetic metal can be used, such as aluminium,



The output filter circuit described

copper or even zinc. Care must be taken to see that the spindles and end-plates of condensers make contact with this shield and that the high potential plates do not. Here it might be noted that a good aluminium panel generally costs less than an ebonite one of the same size and adds to the neatness of the set by eliminating a certain amount of internal wiring, as well as reducing hand capacity effects. Still, there are many who prefer an ebonite panel, and in such cases a metal shield behind the panel can be used.

When operating a receiver with headphones, hand capacity effects will be noticed if H.F. currents are getting into the output leads. A simple test for this is to tune in some station and then grasp the phone leads. If the tuning alters when this is done, it can be assumed that H.F. currents are in the phone leads. These can be effectively blocked by using the filter circuit shown in the diagram, in which L_1 and L_2 are two ordinary H.F. chokes and C_1 , C_2 are fixed condensers of about .0005 mfd. each. In certain cases the proper cure is to put the whole receiver in a metal case, but even this will be of no use if a poor earth connection is used. Although a poor earth connection will not make so very much difference to actual signal strength in a short wave receiver, it will make a great deal of difference to hand capacity effects, and a really good earth connection is essential to the smooth working of the receiver.

M. B.

James Clerk Maxwell

The year 1831 was a remarkable one from the point of view of the advancement of our knowledge of electricity. It witnessed Faraday's first successful experiment in electro-magnetic induction, and also the birth of James Clerk Maxwell, who was later to become a worshipper at the shrine of Faraday, and to give to the world through the means of his mathematical genius the beginnings of the conception of wireless communication.



James Clerk Maxwell
1831—1879

It is impossible for the layman to appreciate the importance of Maxwell's remarkable work in the realms of mathematics, for only the student of advanced mathematics can hope to read his many works with real understanding. He regarded all problems from a mathematical standpoint, and on these lines arrived at the correct solution. He was a great student of Faraday's work, and it has been stated that he decided to read no more on mathematical subjects until he had read Faraday's "Experimental Researches on Electricity." Having done so, he proceeded to transform Faraday's ideas into mathematical formulæ.

It would not be exactly true to say that Maxwell was associated with the discovery of the principles of wireless communication as we now know them, but his wonderful deductive ability led him to foresee that such an electro-magnetic phenomenon must exist, and though he was never able to demonstrate it, he paved the way for Hertz, who was able to demonstrate the existence of and possibility of transmitting and detecting, the waves that Maxwell had postulated in his theoretical work.

Early Activities

Maxwell was educated at Edinburgh Academy and Edinburgh University. Later he had a distinguished career at Cambridge, where he was the first to hold the newly founded Chair as Professor of Experimental Physics. He also had the honour—and to him it must have been also a very real pleasure—of supervising the plans of the famous Cavendish laboratory, and of selecting the apparatus. His contributions to scientific literature were many and classic, and since the truth of his theories has been proved by experiment, it is evident that the foundation that he laid will remain secure to support all that has been built upon it since it was planned in his brain. Astronomy as well as physics attracted his attention and in 1859 his remarkable essay on Saturn's Rings gained for him the Adams prize at Cambridge, but it is chiefly for his work in connection with electricity that his memory will be evergreen among physicists.

His contributions to the literature of science began very early in life, as did his method of devising working models in order to illustrate various problems. He was but in his fifteenth year when he communicated, through Professor Forbes, a paper to the Royal Society of Edinburgh, dealing with a mechanical method of producing Cartesian ovals, and, while still a student, he contributed two more valuable papers to the same society. Before taking his degree at Cambridge he wrote "Faraday's Lines of Force." In the case of the study of electro-magnetism, it may be said that he needs no monument beyond his famous treatise on "Electricity and Magnetism." In this he showed how it was possible to reduce electrical effects to the terms of stresses and motions of a

material medium, and deduced that the speed of electro-magnetic radiation must be equal to speed of light; a fact that we admit in the calculation of frequency or wavelength.

Maxwell was generous in acknowledging the debt he owed to Faraday, for, in the preface to his "Electricity and Magnetism," he wrote: "Before I began the study of electricity, I resolved to read no mathematics on the subject till I had first read through 'Experimental Researches on Electricity.' I was aware that there was supposed to be a difference between Faraday's way of conceiving phenomena and that of the mathematicians, so that neither he nor they were satisfied with each other's language. . . . As I proceeded with the study of Faraday I perceived that his method of conceiving the phenomena was also a mathematical one, though not exhibited in the conventional form of mathematical symbols. I also found that these methods were capable of being expressed in the ordinary mathematical forms, and thus compared with those of the professed mathematicians."

Another valuable contribution—and almost his last—is the "Electrical Researches of the Hon. Frederick Cavendish." Cavendish, who was a man of much the same type as Maxwell, hardly received during his lifetime the credit to which he was entitled for his original researches in many fields. Maxwell died at Cambridge in 1879 after a long and painful illness, during which he exhibited the same calm and patient courage that had distinguished him throughout his life. If each aerial throughout the world had a voice it might well exclaim: "Si monumentum requiris, circumspice." L.R.G.

A Pentode Point

THOUGH the pentode is in most respects a perfectly straightforward valve to use, it has one or two peculiarities which may possibly provide pitfalls for the unwary. It is actually possible, for example, to wreck the valve by making certain circuit alterations which would have no effect whatever upon a triode. Would it occur to anyone who had not been warned against doing so that there was any harm in disconnecting the loud speaker from the secondary terminals of the output transformer with the pentode switched on?

Most pentode transformers have tapped secondaries in order that the impedance may be made to match that of the loud speaker windings. It seems, therefore, the most natural thing in the world that after one pair of secondary terminals has been tried the loud speaker leads should be disconnected and affixed to another. Owing to the characteristics of the pentode, which differ widely from those of other valves, this apparently innocuous disconnection is, to say the least of it, unwise.

What happens is that when the loud speaker is disconnected, the transformer ceases suddenly to be under load. The pentode's characteristics are such that a very high voltage is at once produced across the valve. Surprising as it may seem, this voltage may be many times greater than the maximum terminal E.M.F. of the source of high tension supply. Actually, with a normal plate voltage of 150, the peak voltage produced momentarily by disconnecting the loud speaker may amount to something in the neighbourhood of a thousand volts. The valve is not designed to withstand such electrical pressures, and it may be completely ruined by very little of this treatment. To be on the safe side one should always adopt a hard-and-fast rule of switching off the filament current of the pentode before any alteration is made in the plate circuit. On no account should any attempt be made to fit up switching arrangements to enable a quick change to be made from loud speaker to telephones and vice versa.

R. W. H.

**WHY
PAY more
than 5/6
FOR A UNIVERSAL
VALVE**

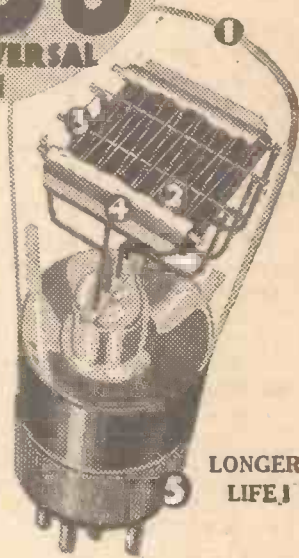
New Glass Bulb 1
Finer yet Tougher.

New Super 2
Strength Grid.

New Non-micro-
phonic Filament 3
with Special
Coating.

New Large Size 4
Anode. Easier
Flow of Electrons.

Dario Milled 5
Base for Easier
Handling.



**LONGER
LIFE!**

**NEW 1930
TYPES!**

**NEW 1930
PRICES!**

The New Dario Valves are even better. New non-microphonic filaments of greater strength, longer life and higher emission! New internal construction! And at still lower prices, made possible by their freedom from price control and the huge output of the Dario Valve factory—one of the largest in the world.

TWO VOLT

Universal	.1 amp	5/6
Resistron	.1 amp	5/6
Super H.F.	.15 amp	5/6
Super Power	.18 amp	7/6
Hyper Power	.3 amp	9/6
Pentodion	.3 amp	18/6

FOUR VOLT

Universal	.075 amp	5/6
Resistron	.075 amp	5/6
Super H.F.	.075 amp	5/6
Super Power	.1 amp	7/6
Hyper Power	.15 amp	9/6
Pentodion	.15 amp	18/6

WRITE FOR FREE FOLDER!



Best way to all Stations

From your dealer or direct:

**IMPEX ELECTRICAL, LTD., Dept. E,
538, High Rd., Leytonstone, London, E.11**

The Mystery of Magnetism

By RALPH STRANGER

Author of "Wireless—the Modern Magic Carpet." "Mystery of Electricity," etc.

X.—Electro-Magnetism

A GOOD deal of the present scientific evidence points to the fact that the magnetic field is associated in some way or other with the electrons themselves, and is as much part and parcel of them as is the electric field. I already mentioned the fact that if a charged body is rotated rapidly it will produce a magnetic field. Since the electron is never at rest, but is always moving at great speeds, it behaves as a charged body, being a pure charge of electricity in itself—hence the magnetic field.

What is the medium in which the electrons are moving? Since they are very much smaller than a molecule of air they must be moving in the ether which is supposed to fill all space. Since the electron is moving and producing a magnetic field as a result of its motion, the magnetic field is, very likely, as much a disturbance in this ether as a wave is a disturbance in water when a vessel is moving through it.

I shall try and make clear the connection between ether and the electron in the light of our present knowledge, in my next serial, "Mystery of the Ether,"* but for the time being let us assume that a

moving electron does produce a magnetic field. We can verify this assumption by bringing a magnetic needle near a wire which has no current flowing through it and observing that the needle remains undisturbed as long as the wire is disconnected from the electrical circuit. But as soon as a current is allowed to flow in the wire, *i.e.*, as soon as a migration of electrons is taking place,

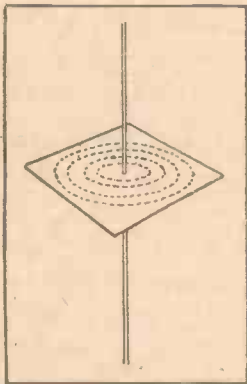


Fig. 1. Field around a wire carrying current.

the needle will be deflected. If we thread the wire through a piece of stiff paper and sprinkle the paper with iron filings, we shall find that as soon as a current is flowing through the wire the iron filings will arrange themselves into a series of concentric circles as shown in Fig. 1. If we experiment with different strengths of current, we shall find that the stronger the current the stronger the magnetic field. This is known as the *magnetic effect of electrical currents*.

Apparently, what happens is that when a large number of electrons is migrating from atom to atom in the wire, they produce circular lines of force in the ether, and thus surround the wire with a uniform "cylinder" of magnetic field. Knowing this, you should try and imagine that every wire which carries a current has around its length, layers of circular lines of force, which contract and expand with the variation in strength of electric current. If the wire carrying a current happens to be wound into a coil, the magnetic field within and around such a coil will appear very much the same as that in and around an ordinary bar magnet. See Fig. 2.

But this does not end the story. If such a coil is traversed by a steady, direct current, *i.e.*, a current of constant strength and direction, each end of the coil will show a definite polarity! One end of the coil will become a north pole

and the other end will become a south pole. Since our wire is of copper, and therefore non-magnetic, it is not a question of the wire becoming magnetised, but that a magnetic field exists in space, independently of the material in the wire, and produces an effect similar to that of a bar magnet.

If the current flowing in the wire is an alternating one, *i.e.*, one that varies in strength and direction from instant to instant, reversing its direction once in every cycle, many times a second, the magnetic field around the coil will also vary in strength from instant to instant and the direction of the lines of force will be reversed once in every cycle. Thus, as you see, we have an *alternating magnetic field*. By arranging, in a suitable manner, two fixed coils through which alternating currents are flowing, such currents being of similar frequency but 90 degrees out of "phase" (*i.e.*, out of step one with the other), it is possible to produce a magnetic field that will rotate in space!

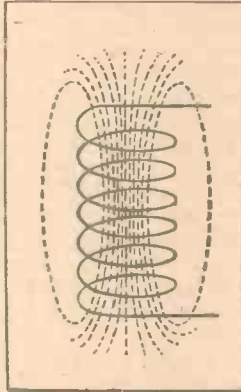


Fig. 2. Magnetic Field around a coil.

Now let us see how we can determine the polarity of the ends of a coil through which a direct current is flowing. If you look at the coil end on, you will find, with the help of a magnetic needle, that if the current is flowing in the same direction in which the hands of a clock move (clockwise), the pole is the south one. If, however, the current (current in the old-fashioned sense) is moving in an anti-clockwise direction, the pole is a north one. You will remember this rule if you use the mnemonical method shown in Fig. 3. Draw two loops of wire side by side. Inscribe inside one the letter S, and inside the other the letter N, providing the ends of the letters with arrows as shown. As you see, the arrows at the ends of the letter S show the direction in which the current should flow

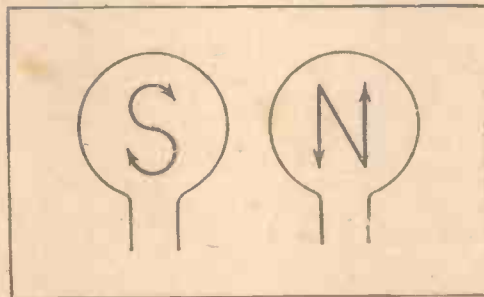


Fig. 3. A rule giving polarity when direction of current flow is known.

if this end of the coil is to have a south pole. Similarly, the arrows at the ends of the letter N show the direction of current for the north pole of the coil. Two coils through which currents are flowing will behave in the same manner as magnets; their ends of like polarity will repel each other and *vice versa*. The magnetic fields will show a distribution of lines of force during attraction and repulsion very similar to that between permanent magnets.

(To be continued.)

Correspondence

Solar Elements

To the Editor, WORLD-RADIO.

SIR,—The list of elements found in the Sun, as given by Mr. Ralph Stranger in his article for this week on "The Mystery of Magnetism" is very suggestive—in its absences more than in what is present. Why, for instance, are all the halogens absent, and why are all the inert gases missing except helium? The reason why the heavier metals are absent seems fairly clear from what is known of their radio-active properties. Uranium, thorium, etc., have probably been converted into lead or other stabler elements by the disintegration of their atoms, accompanied by the emission of the various kinds of rays. This seems to suggest that the same process goes on with the halogens, sulphur, phosphorus, arsenic, mercury, and the other absentees, if the temperature is sufficiently high. The nature of the atom in the case of the inert gases suggests that in them the atoms have split up, in the extremely high temperature, into atoms of other inert gases of lower atomic weight. This explains satisfactorily the presence of helium, which would be the one surviving if this were the case. The halogen atoms would be converted into atoms of other elements of slightly lower atomic weight, perhaps.

It would be interesting to know whether any experiments have been conducted at extremely high temperatures to see if radio-activity occurs at them with elements of lower atomic weights than those which disintegrate at ordinary temperatures. I do not suggest that anyone should try to reach a temperature of 41,000,000 degrees C. on a pressure of 43,000,000,000 atmospheres, but perhaps interesting results would be attainable at a high temperature, though much lower than that.

G. J.

Plymouth, 12th November, 1929.

Indoor Aerials

READERS may find it hard to believe that, with one and the same receiving set, more foreign stations may be receivable on an indoor than on an outdoor aerial. Yet such may quite possibly be the case. Experiments have shown that a really efficient indoor aerial has very little effect upon one's signal strength, though enormously increasing the selectivity of the receiving set used with it. A couple of years ago, when the writer was laid up in bed, he used his ordinary receiving set with an indoor aerial. Every station that had previously been received with the outdoor wire was logged, with many others in addition, the increase being due to the increased selectivity which allowed the local and high-power stations to be cut out far more easily.

A neighbour possesses a receiving set identical with his, and both sets incorporate efficient high-frequency amplification. Recently the neighbour decided to do away with his outdoor aerial, though the writer retained his for ordinary use. On one particular evening, the writer found atmospherics so bad that it was impossible to use the set with any pleasure. On the following morning the neighbour reported that, with his indoor aerial, atmospherics had been far less troublesome and a comparison of logs showed that he had received many stations at good loud speaker strength. On other nights when atmospherics did not interfere the indoor aerial scored owing to the way in which it enabled stations with wavelengths close to 2LO, 5GB and 5XX, to be received clear of interference. The indoor aerial in question consists of a single length of stranded flex suspended round three sides of an attic by means of insulators mounted on struts. Many readers will find it worth while to try an aerial of this kind.

R.W.H.

* "Mystery of the Ether"—a new series by the same author to be published later in *World-Radio*.

PROGRAMME SECTION

Continental Programme Events

SUNDAY, November 24

Concerts

- 6.0 p.m. Leipzig: Requiem by Verdi.
- 7.9 " Berlin, Königswusterhausen: Symphony concert.
- 7.0 " Hamburg: Requiem (Cherubini).
- 7.0 " Königsberg: Requiem for the fallen.
- 7.30 " Breslau: "Inri" (a radio oratorio).
- 7.55 " Hilversum: "Mereille" (Gounod).
- 8.0 " Radio-Paris: Orchestral and vocal.
- 8.0 " Prague, Moravska-Ostrava: Orchestral concert.
- 8.15 " Brussels: Concert (Station's sixth anniversary).
- 8.30 " Frankfurt, Stuttgart: Orchestral.

Plays

- 7.0 p.m. Munich: "Die Trutzige" (peasant comedy).
- 8.15 " Hanburg: "The Wonder-working Beggars."

MONDAY, November 25

Concerts

- 7.5 p.m. Königsberg: Bach's Mass in B Minor.
- 7.30 " Budapest: Hungarian chamber music.
- 7.50 " Hamburg: Mozart concert.
- 8.0 " Leipzig: Symphony concert.
- 8.5 " Munich: Chamber music.
- 8.15 " Prague, Brno, Moravska-Ostrava: Orchestral and vocal concert.
- 8.30 " Königswusterhausen: Hungarian music.
- 8.45 " Bucarest: Chamber music.

TUESDAY, November 26

Concerts

- 7.0 p.m. Prague, Brno, Bratislava, Moravska-Ostrava: Chamber music.
- 7.50 " Königsberg: Orchestral concert.
- 8.0 " Leipzig: Paul Graener modern music programme.
- 8.30 " Brussels: Debussy concert.
- 8.45 " Bucarest: Orchestral concert.
- 9.15 " Copenhagen: Orchestral selections from operettas.

Operas and Operettas

- 6.30 p.m. Munich: Selections from "Faust" (Gounod).
- 7.30 " Stuttgart, Königswusterhausen: "Gringoire" (Brüll).
- 8.0 " Radio-Paris: Operatic selections.

Other Items

- 8.15 p.m. Munich: Reading of Dr. Paquet's: "Water: A Symphony in Words."

WEDNESDAY, November 27

Concerts

- 7.0 p.m. Prague, Brno, Moravska-Ostrava: Orchestral concert.
- 7.30 " Berlin: Arnold Schönberg conducts concert of own compositions.
- 7.30 " Breslau: Orchestral and vocal selections from Lincke's operettas.
- 8.40 " Hilversum: Chamber music.

Operas and Operettas

- 6.30 p.m. Budapest: "Il Trovatore" (Verdi).
- 6.55 " Hamburg: "Cosi Fan Tutte" (Mozart).

Plays

- 8.0 p.m. Radio-Paris: "Peer Gynt" (Ibsen).
- 8.30 " Frankfurt, Stuttgart: "The Passing of the House of Usher" (Poe).

THURSDAY, NOVEMBER 28

Concerts

- 7.0 p.m. Hamburg: Choral concert, 1,000 voices. German folk songs.
- 7.0 " Budapest. Rubinstein anniversary concert.
- 7.15 " Copenhagen: Orchestral and vocal concert.
- 7.30 " Berlin: Violin recital.
- 7.40 " Cologne: Rubinstein concert.
- 7.45 " Leipzig: Symphony concert, conducted by Herr F. Busch.
- 7.55 " Hilversum: Relay from Concert Hall, Amsterdam.
- 7.55 " Königswusterhausen: Rubinstein programme.
- 8.0 " Brussels: Relay from Amsterdam.
- 8.0 " Munich: Symphony concert.
- 8.40 " Königsberg: Rubinstein anniversary programme.

Operas and Operettas

- 9.5 p.m. Barcelona: Relay from Lyceum Opera House
- 10.0 " Madrid: Selections from "Carmen" (Bizet).

Other Events

- 8.40 p.m. Budapest: Talk, "History of British-Hungarian Relations."

FRIDAY, NOVEMBER 29

Concerts

- 3.30 p.m. Vienna: Rubinstein programme.
- 6.30 " Leipzig: Popular concert.
- 7.0 " Copenhagen: Mozart concert.
- 7.15 " Breslau: Orchestral concert.
- 8.0 " Königsberg: Early music for strings and cembalo.
- 8.45 " Bucarest: Orchestral concert.
- 9.15 " Copenhagen: International folk music.
- 9.50 " Hilversum: Puccini Selections.
- 10.0 " Madrid: Orchestral concert.

Operas and Operettas

- 6.30 p.m. Berlin, Königswusterhausen: "Samson and Delila" (Saint-Saëns).
- 6.30 " Budapest. Relay from Opera House.
- 6.55 " Hamburg: "Il Seraglio" (Mozart).
- 7.0 " Cologne: "Salome" (R. Strauss).
- 8.45 " Radio-Paris: "Lakmé" (Delibes).

Plays

- 7.25 p.m. Munich: "Liebele" (Schnitzler).
- 10.5 " Barcelona: "Pepita's Cross" (a comedy).

Other Events

- 8.30 p.m. Leipzig: - Prof. Witkowski, "New Facts about Goethe."

SATURDAY, NOVEMBER 30

Concerts

- 7.0 p.m. Königswusterhausen: Chamber music.
- 7.30 " Prague, Brno, Moravska-Ostrava: Orchestral concert.
- 8.0 " Berlin: Puccini concert.
- 8.15 " Brussels: Orchestra and vocal.

KB-163



FOR THE
KOLSTER-BRANDES
CONCERTS
FROM TOULOUSE

Kolster-Brandes are broadcasting concerts every other Sunday from Toulouse, to alternate with the well-known Sunday programmes from Hilversum. For fine reception use the K-B163 3-valve screened-grid pentode receiver. Price £10 15s. including valves and royalty. This receiver will also give first-class results when a Power Valve is used in place of the Pentode. Price £10 2s. 6d. including valves and royalty.

PROGRAMME OF CONCERT 24th NOVEMBER, 1929.

From 6-8 p.m. (380 metres.)

1. Marche Italienne J. Rousseau
 2. La Reine de Saba (Grand Ballet)
Ch. Gounod
 3. Dans Les Steppes de L'Asie Centrale
Barodine
 4. Sérénade Ayne Kunc
 5. Le Roi D'Ys Lalo
- ENTR'ACTE: GRAMOPHONE MUSIC.
- (i) Plenty of Sunshine De Sylva
 - (ii) Rag Doll Brown
 - (iii) Laughing Marionettes Collino
 - (iv) Sugar Yellen
 - (v) China Boy Muchacho
 - (vi) Ali Baba Markush
6. Fourth Mazurka (Flute Solo M. Dubos),
1st Prix de Paris Pfeiffer
 7. La Havanaise (Soloist Mr. Fred Muccioli),
1st Prix de Paris Saint-Saens
 8. Les Lagunes (Grande Valse).... J. Strauss
 9. La Mascotte (Selection) Audran
 10. Dia de Fiesta (Marche Espagnole)
P. Leduc

Kolster-Brandes

Which Station Was That?

Answers to Correspondents

FLUFFY RUFFLES (Ashton-u-Lyne): Königswusterhausen (Press) on 2,900 m. **CADET** (North Finchley): (1) yes, this was Lausanne (Switzerland); concert of gramophone records, including Liszt's Hungarian Rhapsody No. 2, (2) GFA (Air Ministry, London). **YORKIST** (Bridlington): Turin, now working on 291.1 m. **WOODY** (Dundee): Riga (Latvia); a lady announcer. **A. L. H.** (Hampstead): (1) This was surely Milan, which gave dance music until 11.15 p.m. on that date. Neither Munich nor Vienna advertised dance music at that time, (2) no, not Frankfurt, as German time is one hour in advance of G.M.T.; either Radio Toulouse or San Sebastian (about 403 m.); but cannot say which, (3) Radio LL, Paris; power 0.5 kw. **DAISY BELL** (Yeovil): PTT Algiers. **AYENAITCH** (Leicester): (1) yes, Zeesen relaying dance music from Berlin, (2) yes, Kalundborg, relaying dance music from Copenhagen, (3) Eiffel Tower relaying PTT Paris. **ELPHIN** (Heaton): Cork relaying Dublin. **RADIOLA III** (Matlock): Frankfurt-on-Main (cabaret concert). **PETROS** (Worcester): This was Moscow Popoff in 1,100 m. (40 kw.); an outside relay, not advertised in the programme. **SAILOR** (Buxton): (1) Langenberg relaying English lesson from Cologne, (2) and (3) it is impossible to estimate wavelengths from the condenser readings you give. **FLANDERS** (Ealing): PTT Toulouse; own concert (records). **ETIENNE** (Hatford): 5SX is the Swansea call. Apparently this is an amateur transmitter with call 5XS. Write to the Radio Society of Great Britain, 53, Victoria Street, London, S.W.1. **MOKO** (Portland): PTT Moscow Experimental on 825 m. The October Fête, in celebration of the anniversary of the Bolshevik Revolution. **SEDNEM** (Antwerp): Louvain (Belgium) on 339 m. Apparently this was a test, as no call heard. The reply to your other query was published in last week's issue. **CROWFIELD** (East Grinstead): Radio Toulouse (gramophone records); interval signal: strokes on a bell. **TIME SIGNAL** (Kent): Scheveningen-Haven (Holland) Commercial reports only. This station opens its transmissions with Morse signals and a hooter. **BM/ZPV3** (Newport): Radio LL, Paris. **JEA** (Redhill): (1) yes, Riga (Latvia), (2) why do you suggest Munich and Budapest if WL is below Leeds? There is no relay of these stations on such a low WL. Possibly Karlskrona (196 m.); relay of Stockholm, or St. Quentin (France) on 175 m., but it is impossible to say which, as your details are too vague. **GEO** (N.W.4): Münster relaying Cologne; **SOS**, a wireless play (Friedrich Wolf). See *World-Radio*. **QUIERO**: yes, the Eiffel Tower. This station relays all the main transmissions from PTT Paris. **RADNOR**: Motala relaying church service. **SWIZ** (St. Annes): Cork (gramophone records). **HARROW STEEPLE**: Langenberg relaying dance music from Cologne. **LLVAC** (Reading): Yes, Katowice (Poland); replies to foreign correspondents given in French. This feature is called the "Letter Box." **HOUSBAR** (Penzance): PTT Algiers (North Africa). **J. A. LEWCOCK** (Leeds): No, this was Berlin, relaying from the Sports Palace (Six Days' Cycle Race). **GONDOLIER** (Berkhamsted): This is Turin on 291.1 m. relaying Milan. The opera *Lucia di Lammermoor* (Donizetti). **J. A. H.** (Didsbury): Nürnberg relaying Munich. The latter station's interval signal is five bells, the last one repeated, followed by a hooter. **CRESCENT** (Lines): PTT Algiers (North Africa). **FRANCOIS** (Cardiff): Radio LL, Paris; midday concert. **TONY** (Dunfermline): (1) San Sebastian on 403 m.; possibly relaying Madrid (EAJ7), (2) Leningrad, (3) your details are very vague, but would tally with Hilversum (at that time on 298 m.) giving gramophone records. **ANNEKE** (Torquay): (1) Radio LL, Paris, (2) PTT Lille (own transmission). **SANDROCK** (Walfasey): Zürich (Switzerland); a relay from the National Theatre of the opera *Das Rheingold* (Wagner). **YENDOR** (Portsmouth): Apparently an amateur transmitter; regret, cannot trace. **PORTFIVE** (Scotland): (1) Eiffel Tower relaying PTT, Paris, (2) Königswusterhausen (own transmission); English lesson. **BEGINNER** (Notts): Turin (Italy) on 291.1 m. A mixed concert. The interval signal is the song of the Nightingale (a record). **W. W.** (Blackburn): (1) San Sebastian (EAJ8), (2) Turin on 291.1 m., (3) Hörby relaying Stockholm; transmission to schools. **SCHOOLBOY** (Seaham Harbour): Apparently your estimate of WL is wrong, for details point to PTT Algiers (North Africa) which is now testing after midnight on 364 m., (2) Dublin (selections of works by Ponchielli). **F. C. L.** (Aldeburgh): This was an altered programme from Vienna; no details are available. **INVICTA** (Margate): Rome (orchestral concert and solos). **KERNOW** (Cornwall): Yes, Königswusterhausen (own transmission); English lesson: "Nellie Awaits her Friend in Town." **AMATEURET** (Kirkcaldy): Turin, now working on 291.1 m. **WESTON** (Wells): Radio LL, Paris (gramophone records). **E. N. J. W.** (Northampton): (1) San Sebastian (EAJ8), (2) are you sure of WL? Your details tally with the Cologne programme (outside relay of dance music at that time), either received direct or through Münster. **LADY PEA** (Harrigate): Frederiksstad relayed Oslo. The former station is now working on 345 m. owing to interference caused with Bucharest when working on 394 m. **V 2** (Hollybush): Leipzig (selections from operas). **Z. 135** (Weston-super-Mare): Fog beacons on 1,000 m. (1) GCM (Casquets Lighthouse, Channel Islands), (2) GSM (Start Point Lighthouse), (4) GGG (Round Island Lighthouse), (5) MMH (Spurn Light Vessel), (8) GGK (Skieries Lighthouse). **GOO GOO PAH NUNC** (Leningrad): The October Fête, given in celebration of the Anniversary of the Bolshevik Revolution. The Russian Calendar is eleven days behind ours. **NAMELOC** (W.13): (1) Göteborg relaying Stockholm, (2) Bratislava (Czechoslovakia); *Two Widows*, a comic opera by Zungei, (3) Cork relaying Dublin, (4) Luxembourg (Grand Duchy) on 223 m. **BOY LISTENER** (Ireland): (1) PTT Algiers (North Africa), (2) Moscow Popoff on 1,100 m. (40 kw.). **11d PLEASE** (Crumpsall): It is impossible to trace noises! **TYRO** (Havant): Gramophone records from Hilversum (a test on 298 m.). **FELIUS FOG** (Birmingham): Vienna (an altered programme). **H.T.L.** (Eton): An amateur transmitter; write to The Radio Society of Great Britain, 53, Victoria Street, London, S.W.1. **STAP** (Shetland): Königswusterhausen; a relay from the Circus Busch. Artists brought to the microphone. **R. A. G.** (AIness); **JOHNNY** (Guernsey): Moscow PTT on 825 m. and the high-power transmitter at Moscow on 938 m. This was a broadcast of a fête in celebration of the anniversary of the Bolshevik Revolution. **MIDNIGHT SPECIAL** (Lytham): (1) Lahti (Finland); news in Swedish, (2) Bucharest (Roumania); no other station on or about that WL. as Frederiksstad is now working on 345 m. **DETILF** (Edgbaston): An altered programme from Vienna. **ULSTER** (Portlerry): Turin (Italy), now working on 291.1 m. The interval signal is a record of the song of the Nightingale. **KIDLER** (Bromley): Apparently a test by Louvain (Belgium) on 339 m., but regret, cannot confirm. No other station on or about that WL, likely to tally. **COB-**

COX (East Finchley): Regret, cannot trace. This was not a B.B.C. station. **CAPTAIN COOK** (Yorks): PTT Algiers (North Africa) is testing after midnight on most nights; apparently this was the station you heard. **E. H. P.** (Redruth): This was Vienna (picture transmission). **SCREENED WORKER** (Dublin): (4) Göteborg relaying dance music from Stockholm; words heard were "Godnatt, Godnatt" (Good night), (5) Leipzig relaying dance music from Berlin. **FIDDLER** (Bury): Frankfurt-on-Main testing. **MIDNIGHT SEARCHER** (Essex): (1) Radio Toulouse; interval signal: strokes on a bell, (2) An amateur transmitter; write to the Radio Society of Great Britain, 53, Victoria Street, London S.W.1. **TINSLEY** (Nottingham): Budapest (Hungary); *Aranyvirag*, an operetta in 3 acts (Huszkrav). **MORAY LOON** (Morayshire): Leningrad relaying from the Radio Theatre. **KONK** (Sleaford): English lesson from Oslo (Norway). Cannot trace morse stations. **BEBE** (Derby): This was Vienna (Austria); an altered programme. **PANDORA** (Slough): Apparently this was the Hilversum programme; Dutch time is twenty minutes in advance of G.M.T. Cannot understand your estimate of WL, unless Moscow was relaying foreign stations at that time, but surely you have made a mistake. **OLE LOO** (S.W.16): (1) Freiburg relaying Frankfurt; on November 3 the opera *Carmen* (Bizet), on November 4, cabaret concert, (2) regret, but cannot trace any station on or about that WL, to tally with your details. **HIGH MAST** (Neasden): A test by Frankfurt-on-Main. **M. E. H.** (Surrey): Moravska-Ostrava (Czechoslovakia) relaying Vienna; Styrian folk-songs. **VIATOR** (S.W.7): (1) PTT Algiers (North Africa). **BRIDGE AHOY** (Saxilby): We cannot understand your WL of 25 m. if you mean between 5SW (25.53 m.) and Zeesen (31.38 m.); apparently this was 7LO (Nairobi, Kenya) on 31 m. which works between 4 and 7 p.m. G.M.T. **RHOBOS** (West Wickham): Yes, Kovno (Lithuania); Kaunas is the native name. **ECNARP** (Torquay): Milan relaying quartet concert from Turin; the song of the nightingale (record) is the interval signal of the latter station. **J. M. M.** (Benview): (1) Radio Toulouse, (2) Hilversum, at that time working on 298 m. (a German lesson), (3) Stuttgart was the only German station advertised to work at that time (dance music); Frankfurt and Cassel were relaying this programme, and apparently you received it through the latter station, (4) possibly Bucharest (Roumania); violin concert advertised for 9.15 p.m. and song recital at 8.45; quite possibly these two items were inverted. **DIGGER** (Birmingham): Hilversum testing (298 m.). **STRANGFORD** (Belfast): Frankfurt-on-Main testing. **WOODLAND** (Manchester): It is absolutely impossible to identify the stations you hear from condenser readings only; some other details must be given. To estimate WL, condenser readings of *known* stations' wavelengths must be compared with those you wish to identify. Surely amongst those you give, you know which is 2LO, 5XX and 5GB? Readings of these stations give you data for a basis. **1 WONDER** (Reigate): (1) Yes, this is Cracow (Poland). The bugle call was relayed from the Tower of the Church of Notre Dame, and is given every night (an old custom of that city), (2) yes, quite possible. **MARY** (Kersal): (1) Milan relaying Turin; you heard the latter station's signal; (2) Riga; news and weather followed by gramophone records; (3) we cannot trace on this wavelength; the only soprano recital given at that time was from the Oslo studio; it may have been relayed by a foreign transmitter; (4) this would appear to be a harmonic as there is no German station on that wavelength; we cannot trace the item in any programme. **KELBURNE** (Paisley): You give no estimation of wavelength, but the details tally with Radio Velthem (Louvain, Belgium) on 339 m. **CYMRO** (North Wales): Cannot trace if not 55W, Chelmsford. **WOODY** (Dundee): Not advertised but possibly altered programme at Oslo. **MAC** (Southampton): Turin on new wavelength (see *World-Radio*). **STRAIGHT THREE** (Bridge of Allan): Velthem (Louvain). The call was "Hier ist Radio Katholieke Omroep, Luven." **CEAN** (Edinburgh): See previous reply. **E. C. L.** (Cannon Hill): Yes, Kovno; studio concert. **MABS** (Gosport): Belgrade; a concert by the orchestra of the Voivodin Students' Union. **TYRO** (Havant): No programme was advertised at that time. Possibly Flensburg relaying concert from the Caf e Petri, Hanover, but we cannot confirm. **CORIOLA** (New Barret): Your details are very vague. Would appear to be the Glasgow programme heard through one of the Scottish relays. **TWO VALVER** (Coventry): Velthem, Louvain. See reply to **STRAIGHT THREE** (Bridge of Allan). **VIATOR** (S.W.7): We are unable, at present, to identify the station relaying 5SW.

IDENTIFICATION COUPON (No. 44.)

This coupon is valid for ONE QUESTION only, and should be cut out and attached to a separate sheet, upon which the following questions should be answered in the order shown. No coupon more than one month old is valid.

1. Time and Date of reception.
2. Approximate frequency in kilocycles per sec. (or wavelength in metres).
3. Nearest known stations, above and below.
4. Call or interval signal, if heard.
5. Language.
6. Type of receiver in use and strength of signal.
7. Details of programme or signal received.
8. Name and address.
9. Nom de plume. (Proprietary names must not be used.)

Welcome Back Again!

I CAN well remember the time when everywhere on the Continent, but especially in Germany, all the shops advertised their higher quality sets as guaranteeing perfect reception of the B.B.C. stations. "Garantierter England Empfang" was the phrase of the moment. Then followed a time when it was not so wonderful any more to hear British stations. And then, sad to say, came the time when the B.B.C. stations, with the exception of Daventry, completely faded from the average listener's log. Other higher-powered stations superseded them. Daventry 5XX still remained, of course, until at last even it did not compare with high-power, long-wave Continentals. Bear in mind, I am talking as a listener in the South of Germany. Those who wanted to hear the B.B.C. stations always could, but they did not count any more among those one turned to as a matter of course. Then came Daventry 5GB. But it is very often jammed by a powerful German station. For the last two years, in fact, as far as the average listener in these parts was concerned, the high-power B.B.C. stations came in only when others were closing down, owing to the difference in time, and the low-power stations were completely wiped out.

Since October 20, 1929, things have changed. The new 2LO transmitter is worthy of its Continental brothers. No difficulty in getting an English programme now! It roars in with only slight fading, now and then. Already the average European listener is pricking up his ears, and those of the old brigade welcome the newcomer as a dear old friend cherished from the days of the Strand transmitter. Welcome back to the ether, 2LO, after long absence, for the distant listener not possessing a super-power receiver and preferring the "easy" ones! 2LO is back among the ranks of those "easy" ones. Congratulations! A. A.

"England's Great Surprise"

THE English people do not understand the art of propaganda for broadcasting, for in no other country would it have been possible that a new transmitter should begin operations without the Press having previously boosted it weeks and months beforehand. But the Englishman prefers the propaganda of action, and indeed the newly-erected transmitter at Brookmans Park, North-West of London, is a great achievement. No doubt the aerials on the roof of Selfridge's Stores in Oxford Street ponder now why the whole of the London programme has been given over for transmission to this new 30 kw. Station. But Europe can answer the question; it is because the British Broadcasting Corporation wanted to possess a transmitter which was to be, not only as regards power, but also as regards modulation, one of the best among all European transmitters. Whoever has had the opportunity during the last few days to listen to the transmissions of Brookmans Park would have been surprised at the softness of the modulation. In addition, fading is so slight that one is tempted to put it down to a happy aerial construction.—Radio Bern.

The Alternative Postal Service

In addition to the free published service of "Which Station was That?" replies to queries can be obtained within forty-eight hours of receipt of details on payment of 6d. in stamps or P.O., accompanied by coupon and stamped addressed envelope. Each query should be numbered and the questions on the coupon carefully answered. Letters must be addressed to the Editor, *World-Radio*, Savoy Hill, W.C.2. Envelopes to be marked in left-hand top corner "Postal Query Service."



**"REGIONAL"
STATION ELIMINATOR.**

DOUBLES THE SELECTIVITY OF YOUR SET

Cuts out your Local or Regional Station and brings in distant, weak and foreign Stations 25% louder and clearer.



PRICE
10/6
POST FREE.

Fitted in 30 seconds.

NO ALTERATIONS TO YOUR SET.

Come and see it demonstrated in our Showroom.

I.D.S. 4, GOLDEN SQ. (Piccadilly Circus),
Telephone: Gerrard 2437. W.1.

CLIX

for

CONTACT

There are
21 VARIETIES

of contact in the Clix range and each one is designed to solve a contact problem. They will solve yours!



No. 15. **CLIX ALL-IN PLUG AND SOCKET.**

Wherever a terminal of any sort is required, the Clix Plug and Socket can be utilised. With it you will obtain safer, speedier and better contact. It is entirely insulated when connected or disconnected.

Price, complete **8d.**

Flex Portion, 4d. Panel Portion, 4d. Both portions Engraved.



No. 5. **CLIX RING TERMINAL.**

An ideal fitment for permanent contact. Red and black ... **2d.**



No. 2. **CLIX PIN TERMINAL**

The pin with numerous uses. Red and black ... **2d.**

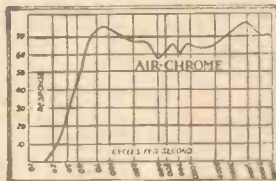
Write for the Clix Folder containing full details of the 21 varieties.

LECTRO LINX, LTD.

254, Vauxhall Bridge Road, S.W.1.



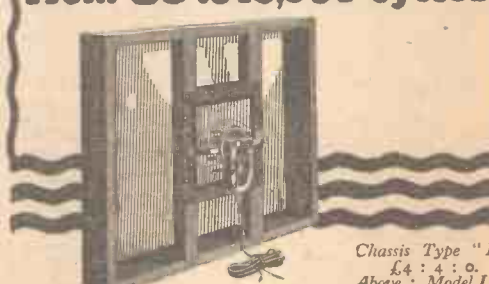
British Patent No. 295,625



The Ultra Air Chrome is obtainable in Cabinet Models from £3 : 19 : 6 and in Chassis Types from £2 : 2 : 0. Stocked by every radio and music dealer from Land's End to John o'Groats.

The Remarkable Performance Curve of the Ultra Air Chrome Speaker.

Uniform frequency response from 60 to 10,000 cycles



Chassis Type "F"
£4 : 4 : 0.
Above : Model U14
£5 : 5 : 0



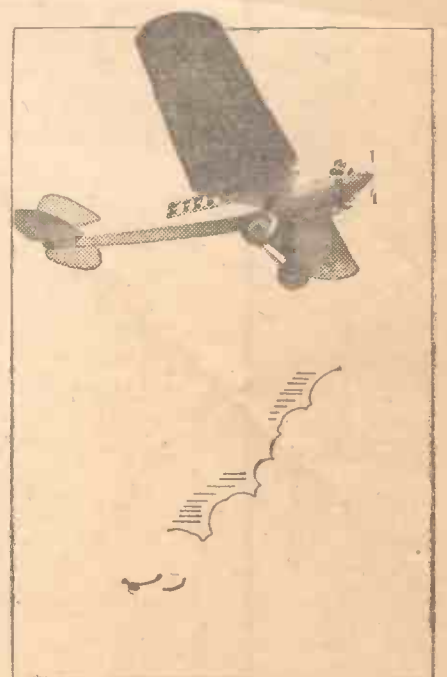
We believe that as a reader of "World-Radio" you are critical, and that you aim to possess Radio of the highest technical efficiency.

You may never have heard the vital difference between ordinary radio and Air Chrome Radio. If broadcasting means more than just an entertainment you should. Every musician, every technician, every dealer says that Air Chrome is the magic password to natural Radio, gloriously brilliant in music, speech and song.

Hear this famous double linen diaphragm speaker at your dealer's to-night. It is wonderful.

**ULTRA
AIR CHROME
S P E A K E R**

10,000 FEET UP!



Great 20-passenger

Air-Liners rely on

Marconi Valves for

navigation messages

CROYDON aerodrome—noon. "All aboard? Cast off!" Giant air-liner roars upwards. Chessboard far below—Surrey, Kent. Silver glittering in sun—Channel. Pilot wireless to Croydon: "Sea dead-calm. Flying at 10,000 feet. Slight breeze." Fifteen minutes later—poplars of Picardy. Le Bourget. Punctual to the minute. Three hours—three hundred miles. And all the time in touch with aerodromes—through Marconi Valves.

Imperial Airways' machines use Marconi Valves. Croydon Control Tower uses them. For their reliability. For their long range. Your radio set would be better for them. Give you greater volume, clearer tone, longer service. Cost no more. Fit any set.

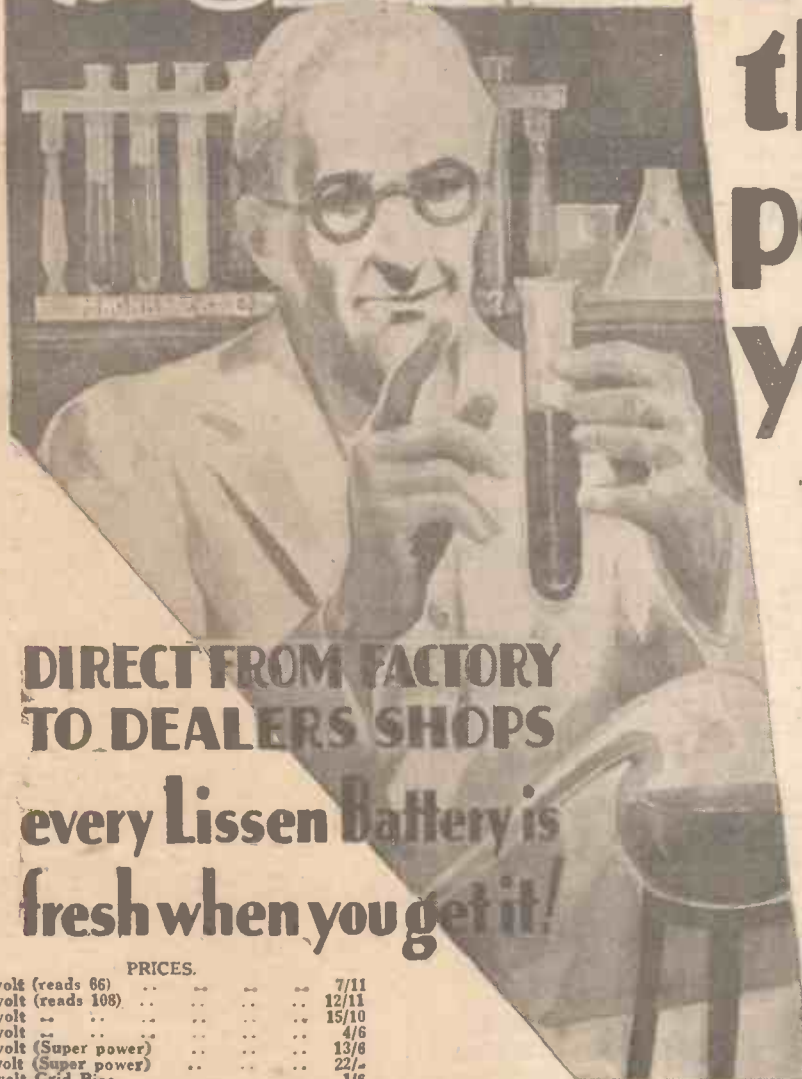
**MARCONI
VALVES**

The first and greatest name in wireless

Marconiphone Company Limited
210 Tottenham Court Road, London, W.1

The SECRET PROCESS

that puts power into your set!



DIRECT FROM FACTORY TO DEALERS SHOPS
every Lissen Battery is fresh when you get it!

There is a secret process and a new chemical combination used only in the Lissen Battery which puts new power into your radio set. It gives to your reproduction of dance music a new liveliness, makes speech distinct, song clear and true.

The current of a Lissen Battery flows smoothly, steadily, sustainedly throughout the longest programme. The large cells have a great oxygen content which gives the battery long life and produces all the time pure power, with never a trace of ripple in it, never a sign of hum.

You want pure power for your radio; any good wireless dealer will supply you with the Lissen Battery that will give it to you.

PRICES.

60 volt (reads 66)	7/11
100 volt (reads 108)	12/11
120 volt	15/10
36 volt	4/6
60 volt (Super power)	13/6
100 volt (Super power)	22/-
9 volt Grid Bias	1/6
4 1/2 volt Pocket Battery, 5d. each (4/6 a doz.)	
Single Cell Torch Battery	4 1/2d.



LISSEN LIMITED Worples Road, Isleworth Middlesex. Factories also at Richmond (Surrey) and Edmonton. (Managing Director: T. N. Cole.)

(5XX)

DAVENTRY PROGRAMME

(November 24-30)

(25 kw.)

193 kc/s (1,554.4 metres).

SUNDAY (Nov. 24)

- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 3.0—3.30 p.m.—Church Cantata. (No. 26) Bach. "Ach wie flüchtig, ach wie nichtig." ("Ah, how fleeting, ah, how fading.") Mary Hamlin (Soprano), Doris Owens (Contralto), Frank Titterton (Tenor), William Barrand (Bass), Leslie Woodgate (Organ), The Wireless Chorus, The Wireless Orchestra. (Flute, Oboes, Trumpet and Strings). Conducted by Stanford Robinson.
- 3.45 p.m.—A Concert. Betsy de la Porte (Contralto), Walter Glynn (Tenor). St. Hilda's Band.
- 5.15—5.45 p.m.—A Violoncello Recital by Antoni Sala: Sonata (Porpora), Largo; Allegro; Adagio; Allegro; Elegie (Faure); Allegretto (Boccherini, arr. Kreisler), Lament of Fanaid Grove (Old Tune arr. Herbert Hughes), Allegro Spiritoso (G. B. Senaille).
- 5.45—6.0 p.m.—Bible Reading. Paul of Tarsus—XV. King Agrippa, Acts xvii, 1-32.
- 8.0 p.m.—A Religious Service. From the Studio. Conducted by the Rev. J. Alfred Sharp, D.D.
- 8.45 p.m.—The Week's Good Cause: Appeal on behalf of The "Not Forgotten" Association, by the Marchioness of Salisbury.
- 8.50 p.m.—"The News." Weather Forecast, General News Bulletin, Local News, Shipping Forecast.
- 9.5 p.m.—An Orchestral Concert. Roy Henderson (Baritone). The Wireless Symphony Orchestra. (Leader, S. Kneale Kelley). Conducted by B. Walton O'Donnell. The Orchestra: Symphony No. 102, in B Flat (Haydn). Roy Henderson and Orchestra: Recit., "Hai gia vinta" Aria, "Vedro mentr' io sospiro" ("Figaro") (Mozart). Orchestra: Symphonic Poem, "Don Juan" (Strauss). Roy Henderson: None but the weary heart (Tchaikovsky), Nocturne (Stanley Long), The Hostel (Baird). Orchestra: "Casse Noisette" ("The Nutcracker") Suite (Tchaikovsky).
- 10.30 p.m.—Epilogue.

MONDAY (25)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45 a.m.—Miss Barbara Cartland: "Making the Best of Oneself—II, Getting the Right Frame of Mind."
- 11.0—11.30 a.m.—Gramophone Records.
- 12 noon.—A Ballad Concert. Mattie Gibson (Soprano), William Evans (Baritone).
- 12.30 p.m.—Organ Music. Played by Edward O'Henry.
- 1.0 p.m.—Light Music. Leonardo Kemp and his Piccadilly Hotel Orchestra.
- 1.0—1.15 p.m.—Pianoforte Interlude.
- 1.15—2.0 p.m.—A Concert. By The National Orchestra of Wales.
- 2.0 p.m.—For the Schools. Dr. Herbert Schroeder: German Reading—"Die Entdeckung Eldorados," from "Starnstunden der Memmscheit," by Stefan Zweig.
- 2.20 p.m.—Interlude.
- 2.30 p.m.—Miss Rhoda Power: "Days of Old—The Middle Ages—X, A Housewife's Day at Home."
- 3.0 p.m.—Interlude.
- 3.25 p.m.—Miss Rhoda Power: "Stories for Younger Pupils—X, The Hunter who Married a Star-Maiden (Algonquin)."
- 3.20 p.m.—Interlude.
- 3.25 p.m.—Fishing Bulletin.
- 3.30 p.m.—Dance Music. Jack Payne and The B.B.C. Dance Orchestra.
- 4.15 p.m.—Light Music. Alphonse du Clos and his Orchestra. From The Hotel Cecil.
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—"Careers for Boys and Girls"—V. Mr. Cuthbert Laws: "The Merchant Navy."
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
- 6.30 p.m.—Musical Interlude.
- 6.45 p.m.—The Foundations of Music. Russian Songs sung by Tatiana Makushina.
- 7.0 p.m.—Mr. James Agate: Dramatic Criticism.
- 7.15 p.m.—Musical Interlude.
- 7.25 p.m.—M. E. M. Stéphan: French Talk: Reading from "Le Pipe," by André Theunet.
- 7.45 p.m.—A Military Band Concert. John Morel (Baritone), Cecil Baumer (Pianoforte) The Wireless Military Band. Conducted by

- B. Walton O'Donnell: Overture, "Maritana" (Wallace). John Morel: Teresita mia (Serenade), Me Gustan Todas (All things please me) (Traditional Songs of the Pyrenees), Asturiana, Seguidilla Murciana (Spanish Airs) (de Falla). Band: A Miniature Suite (Eric Coates), Children's Dance; Intermezzo; (Scène du Bal). Cecil Baumer: Etude Mignonne (Percy Pitt), Waltz in E Flat (Lenormand), Minstrels (Debussy), Seguidillas (Spanish Dance) (Albeniz). Band: Selection, "Der Bettel Student" ("The Beggar Student") (Millöcker). John Morel: My Lodging is on the Cold Ground, Sally in our Alley (Seventeenth Century). Band: Czardas, "Ungarischer Schäferstanz" (Hungarian Shepherd's Dance) (Gung'l), Flight of the Bumble Bee ("The Legend of the Tsar Sultan") (Rimsky-Korsakov), March, "Old Panama" (Alford).
- 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 9.15 p.m.—Mr. E. A. B. Barnard: "Preserving History."
- 9.30 p.m.—Local News, Shipping Forecast and Fat Stock Prices.
- 9.35 p.m.—Chamber Music. Betty Bannerman (Contralto). The Virtuoso String Quartet. Marjorie Hayward (Violin), Edwin Virgo (Violin), Raymond Jeremy (Viola), Cedric Sharpe (Violoncello).
- 11.0 p.m.—12 midnight.—Dance Music.

TUESDAY (26)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45 p.m.—More Vegetarian Recipes for Fishes.
- 11.0—11.30 a.m.—Gramophone Records.
- 12 noon.—Organ Music. Played by Russell W. K. Taylor.
- 1.0—2.0 p.m.—Light Music. Alphonse du Clos and his Orchestra. From The Hotel Cecil.
- 2.25 p.m.—Fishing Bulletin.
- 2.30 p.m.—For the Schools: Sir Walford Davies—Music. (a) A Beginner's Course, (b) A Miniature Concert, (c) An Advanced Course.
- 3.0 p.m.—Interlude.
- 3.25 p.m.—Monsieur E. M. Stéphan: "Elementary French."
- 4.0 p.m.—Light Music. Fred Kitchen and The Britton Astoria Orchestra.
- 4.15 p.m.—Special Talk for Secondary Schools: Mr. Vernon Bartlett, "Current Affairs—V, Danger Spots."
- 4.30 p.m.—Pattman at the Organ. Followed by Fred Kitchen and The Britton Astoria Orchestra.
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—Poems by Edward Shanks read by Ronald Watkins.
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
- 6.30 p.m.—Lady Tree's and Henry Ainley's Concert in aid of The League of Mercy.
- 7.0 p.m.—"While London Sleeps"—IV, "A River Policeman."
- 7.15 p.m.—Musical Interlude.
- 7.25 p.m.—Professor A. C. Seward: "The Origins of Life—IV, Fossils as Evidence of Past Climates and Conditions."
- 7.45 p.m.—A Light Orchestral Concert. Constance Wentworth (Soprano), Frederic Lake (Tenor). The Wireless Orchestra. Conducted by John Ansell.
- 8.0—8.30 p.m.—Dr. William Brown: "Mind and Body—IV, The New Psychology."
- 8.30—9.0 p.m.—Orchestral Concert—continued.
- 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 9.15 p.m.—Sir Walford Davies: "Music and the Ordinary Listener—IX, Words and Music."
- 9.35 p.m.—Local News, Shipping Forecast and Fat Stock Prices.
- 9.40 p.m.—Vaudeville. Clapham and Dwyer (In another Spot of Bother), The Masks (Vocal Trio), Betty Hardy (Character Monologues), Jack Payne and The B.B.C. Dance Orchestra and a Relay from The Palladium.
- 10.45 p.m.—12 midnight.—Dance Music.

WEDNESDAY (27)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45 a.m.—Mrs. M. A. Hamilton, M.P.: "The Week in Parliament."

- 11.0—11.30 a.m.—Gramophone Records.
- 12 noon.—A Ballad Concert. Violet Pearson (Soprano), Henry Luscombe (Baritone).
- 12.30 p.m.—Gramophone Records.
- 1.0—2.0 p.m.—Light Music. Frascati's Orchestra. Directed by Georges Haeck.
- 2.25 p.m.—Fishing Bulletin.
- 2.30 p.m.—For the Schools: Miss C. Von Wyss: "Nature Study for Town and Country Schools—IX, Winter Sleep."
- 2.55 p.m.—Interlude.
- 3.0 p.m.—Miss Marjorie Barber: "Stories and Story-telling in Prose and Verse—Epic (Homer—The Odyssey)."
- 3.25 p.m.—Interlude.
- 3.30 p.m.—Mrs. C. D. Rackham: "How we Manage our Affairs—IV, How the Council works outside our Homes."
- 3.45 p.m.—A Light Classical Concert. Mary Morris (Contralto). The Phyllis Macdonald Trio.
- 4.45 p.m.—Organ Music. Played by Alex Taylor.
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—Musical Interlude.
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
- 6.30 p.m.—Musical Interlude.
- 6.45 p.m.—The Foundations of Music. Russian Songs sung by Tatiana Makushina.
- 7.0 p.m.—Mr. T. M. Ainscough, H.M.'s Senior Trade Commissioner in India and Ceylon: "India, our Greatest Export Market?" (Under the auspices of the Department of Overseas Trade).
- 7.15 p.m.—Musical Interlude.
- 7.25 p.m.—Sir Richard Redmayne: "Coal-Mines: Past, Present and Future—IV, Post-War Legislation."
- 7.45 p.m.—"Louise." Act I and Act II, Scene 1.
- 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 9.15 p.m.—"The Testament of Beauty." A Reading by Miss Sackville West from Dr. Robert Bridge's Poem.
- 9.35 p.m.—Local News, Shipping Forecast and Fat Stock Prices.
- 9.40 p.m.—"Louise." Act II, Scene 2, Act III.
- 10.50 p.m.—Interval.
- 11.0 p.m.—"Louise." Act IV.
- 11.35 p.m.—12 midnight.—Dance Music.

THURSDAY (28)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45 a.m.—"Parents and Children"—XIII, The Hon. Mrs. St. Aubyn: "Keeping up with your Children."
- 11.0—11.30 a.m.—Gramophone Records.
- 12 noon.—A Concert. Frida Lendrum (Soprano), Margot McGibbon (Violin), Hywel Hughes (Pianoforte).
- 1.15—2.0 p.m.—A Lunch Hour Concert. The City of Birmingham Orchestra. Conducted by Adrian Boulton.
- 2.25 p.m.—Fishing Bulletin.
- 2.30 p.m.—For the Schools. Mr. A. Lloyd James: "Speech and Language."
- 2.50 p.m.—Interlude.
- 3.0 p.m.—Evensong. From Westminster Abbey.
- 3.45 p.m.—Mr. J. W. Robertson Scott: "Our Great Grandfathers' Countryside—III, How the Farmer Lived."
- 4.0 p.m.—Shoreditch Schools' Musical Association Annual Festival Concert. Relayed from Shoreditch Town Hall.
- 4.30 p.m.—A Concert. Leonard Ashdowne (Baritone), Jacques Serres (Violoncello), Elsie Wood, Vera Towsey (Two Pianofortes).
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—Musical Interlude.
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
- 6.30 p.m.—Market Prices for Farmers.
- 6.35 p.m.—Musical Interlude.
- 6.45 p.m.—The Foundations of Music. Russian Songs sung by Tatiana Makushina.
- 7.0 p.m.—Miss V. Sackville-West: "New Novels."
- 7.15 p.m.—Musical Interlude.
- 7.25 p.m.—Mr. A. V. Judges: "Life and Labour in England from

- Elizabeth to Anne—IV, Trade with Europe and Beyond."
- 7.45 p.m.—Hallé Concert, The Hallé Orchestra. Conducted by Sir Hamilton Harty. Orloff (Pianoforte). Orchestra: Serenade, "Eine Kleine Nacht-Musik" (Mozart), Concerto in A (K.488), for Pianoforte (Mozart), (Solo Pianoforte, Orloff), Symphony No. 4 in D (Schumann). Interval. "Ears" from "The Essays of Elia," by Charles Lamb, read by Ronald Watkins.
- 9.5 p.m.—Hallé Concert (continued): The Garden of Fand (Bax). Orloff: Pianoforte Solos: Nocturne, Study (Chopin), Prelude in G Minor, (Rachmaninov). Orchestra: Dance Rhapsody (Delius).
- 9.45 p.m.—"The Second News." Weather Forecast, Second General News Bulletin, Local News, Shipping Forecast.
- 10.5 p.m.—Mr. Vernon Bartlett: "The Way of the World."
- 10.20 p.m.—12 midnight.—Dance Music. Jack Payne and The B.B.C. Dance Orchestra. Maria Sandra (Negro Spirituals).

FRIDAY (29)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45 a.m.—Mrs. Williams: "Keeping Back the Years."
- 11.0—11.30 a.m.—Gramophone Records.
- 12 noon.—A Sonata Recital. Vyvyan Lewis (Violoncello), Norman Fraser (Pianoforte).
- 12.30 p.m.—Organ Music. Played by Leonard H. Warner.
- 1.0—2.0 p.m.—Gramophone Records.
- 2.25 p.m.—Fishing Bulletin.
- 2.30 p.m.—For the Schools. Dr. B. A. Keen: "Farming—V, Horses, Pigs, Poultry."
- 2.55 p.m.—Interlude.
- 3.0 p.m.—"Peoples of the World and their Homes"—X, Mr. C. F. Rey, "Abyssinia."
- 3.25 p.m.—Hints on Athletics and Games—X, "Athletics—Learning to Run," by Lieut.-Col. W. K. Duckett.
- 3.40 p.m.—Interlude.
- 3.45 p.m.—Concert to Schools. The Sybil Eaton String Quartet.
- 4.30 p.m.—Light Music. Moschetto and his Orchestra, from The May Fair Hotel.
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—Miss Marjorie Guy: "Some New Ways of Cooking Haddock."
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
- 6.30 p.m.—Ministry of Agriculture fortnightly Bulletin.
- 6.45 p.m.—The Foundations of Music. Russian Songs sung by Tatiana Makushina.
- 7.0 p.m.—Mr. Ernest Betts: Film Criticism.
- 7.15 p.m.—Musical Interlude.
- 7.25 p.m.—The Rev. M. R. Ridley: "Poetry and the Ordinary Reader"—IV.
- 7.45 p.m.—Vaudeville. Leslie Weston, Betty Warren, Tommy Handley, The Hungarian Gipsy Band, The Bayan Vocal Sextet (in Russian Songs), Jack Payne and the B.B.C. Dance Orchestra, and Angela Baddeley in a Sketch, "Shadows."
- 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 9.15 p.m.—Topical Talk.
- 9.30 p.m.—Local News, Shipping Forecast and Fat Stock Prices.
- 9.35 p.m.—"Roland." A Drama derived from Turold's story by E. A. Harding. Produced by Peter Creswell.
- 10.35 p.m.—Surprise Item.
- 10.50 p.m.—12 midnight.—Dance Music.

SATURDAY (30)

- 10.15 a.m.—The Daily Service.
- 10.30 a.m.—Time Signal (Greenwich), Weather Forecast.
- 10.45—11.0 a.m.—Miss Ethel R. Hambridge: "Dress Designing and Decoration."
- 1.0—2.0 p.m.—Light Music. Moschetto and his Orchestra. From The May Fair Hotel.
- 3.5 p.m.—Fishing Bulletin.
- 3.10 p.m.—Arsenal v. Newcastle United. A Running Commentary on the Second Half of the First League Football Match. Commentators: Mr. George F. Allison and Mr. Derek McCulloch.
- 4.15 p.m.—Rosemary Waldron (Soprano), Walter Kinsey (Baritone).

- 4.45 p.m.—Organ Music. Played by Alex Taylor.
- 5.15 p.m.—The Children's Hour.
- 6.0 p.m.—Col. J. T. C. Moore-Brabazon: An Eye-witness Account of the Cycle and Motor-Cycle Show at Olympia.
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin, Announcements and Sport Bulletin.
- 6.40 p.m.—Musical Interlude.
- 6.45 p.m.—The Foundations of Music. Russian Songs sung by Tatiana Makushina.
- 7.0 p.m.—Mr. Basil Maine: "Next Week's Broadcast Music."
- 7.15 p.m.—The Week's Work in the Garden, by the Royal Horticultural Society.
- 7.30 p.m.—American Dance Records.
- 8.0 p.m.—A St. Andrew's Night Programme. St. Andrew for Scotland I
- 9.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 9.15 p.m.—Mr. Gerald Barry: "The Week in London."
- 9.30 p.m.—Local News, Shipping Forecast and Fat Stock Prices.
- 9.35 p.m.—A Sonata Recital by Joseph Szigeti and Harriet Cohen: Second Sonata for Violin and Pianoforte (Bax), Fantasy; The Grey Dancer in the Twilight; Very Broad; Allegro feroce, Sonata in G for Violin and Pianoforte (Brahms), Vivace ma non troppo; Adagio; Allegro molto moderato.
- 10.35 p.m.—12 midnight.—Dance Music.

(Continued from page 831.)

- Mary Ogden (Contralto). Songs: Leonard H. Warner.
- 4.0 p.m.—Dance Music. Jack Payne and the B.B.C. Dance Orchestra. Harley and Barker (Syncopated Harmony).
- 5.30 p.m.—The Children's Hour.
- 6.30 p.m.—Light Music. (From Birmingham). The Birmingham Studio Orchestra. Conducted by Joseph Lewis. Overture, "The Siege of Rochelle" (Balfé), Mary, Pollock (Soprano): "The Abess, Dream and Alone (D'Erlanger), Ethel Cobban (Pianoforte): Scherzo in B Flat Minor (Chopin) Orchestra: Lyric Melody, "Pearl o' Mine" (Fletcher).
- 7.0 p.m.—"Salome." An Opera by Richard Strauss. Relayed from The Cologne Opera House. S.B. from Cologne.
- 8.45 p.m.—An Hour of Requests. (From Birmingham). The Birmingham Studio Chorus.
- 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 10.15 p.m.—Dance Music. Teddy Brown and his Band, from Ciro's Club.
- 11.0—11.15 p.m.—Jack Harris's Grosvenor House Band from Grosvenor House, Park Lane.

SATURDAY (30)

- 2.30 p.m.—A Children's Concert.
- 3.45 p.m.—Dance Music.
- 5.0 p.m.—A Violin Recital by Paul Beard (Violin).
- 5.30 p.m.—The Children's Hour.
- 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin, Announcements and Sports Bulletin.
- 6.40 p.m.—Sports Bulletin.
- 6.45 p.m.—A Concert. The Gresham Parkington Quintet. Frank Ward (Baritone). Constance Hope (Soprano).
- 8.0 p.m.—A Military Band Concert. The Wireless Military Band. (Conducted by B. Walton O'Donnell): Overture, "Calm Sea and Prosperous Voyage" (Mendelssohn).
- 8.15 p.m.—Gertrude Johnson (Soprano): A Funny Fellow (Head). Waltz Song ("Tom Jones") (German).
- 8.22 p.m.—Band: Two Norwegian Dances, Nos. 2 and 3 (Grieg).
- 8.28 p.m.—Gertrude Johnson: Snow-takes (Mallinson); The Dove (Landon Ronald); Where the bee sucks (Brearley).
- 8.35 p.m.—Band: Poetical Scenes (Godard).
- 9.0 p.m.—"You're Through." (From Birmingham). A Radiophonic Revue in ten wrong numbers.
- 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
- 10.15 p.m.—Sports Bulletin (from Birmingham).
- 10.20—11.15 p.m.—The Birmingham Studio Augmented Orchestra.

EYESIGHT SPECIALIST'S REMARKABLE DISCOVERY

New Scientific Method of Strengthening Weak Vision Without Eyeglasses

**SIMPLE HOME TREATMENT VOUCHED FOR BY DOCTORS
WHO HAVE PROVED ITS SUCCESS BY THEIR OWN
PERSONAL EXPERIENCE.**

**Eyes Whose Sight was Failing for Years Regain Clear Sight—Elderly
People Obtain the Vision of Youth—Short-Sighted Obtain Normal
Range of Vision—Railwaymen and other Workers Who Had Lost Their
Employment Through Defective Sight Now Able to Pass Stiff Eyesight Tests**

**Free Illustrated Book About This
Epoch-Making Discovery for Every
"World-Radio" Reader.**

illustrated book written by Mr. Havilland, and arrangements have been made for a free copy to be sent to every reader of *World-Radio*. Readers are specially



Dear Sir,
I am particularly pleased to say that my eyesight has improved beyond all expectations. I can read without any discomfort whatsoever. Taking into consideration the very bad condition of my eyes before commencing your Treatment the benefit is truly astounding. Yours faithfully,
(Signed) A. FOSTER.
One of the 35,000 who have benefited by the remarkable new method of Eyesight Improvement described in this announcement.

A CLERK writes:—"My eyes have improved wonderfully and I no longer have use for glasses. The benefits I have received are indeed surprising."
—W. R., of Liverpool.

LADY of 66 writes:—"Worn glasses for 20 years. My eyes are much stronger, and my headaches have disappeared."
—A. E. M.

Case 18314. Mr. R. J. L. Age 55. Customs Watcher. Short Sight and General Weakness. Wore glasses for 12 years. Reports after 3 months' Havilland Treatment:—

"I am pleased to inform you that I am extremely gratified with the sure and steady progress my eyes have made. They have so benefited from your splendid Treatment that I have been able to dispense with my glasses, with the result that I am most highly delighted."

Case 11040-1. Mrs. A. H. Age 32. Housewife. Writes:—

"I must thank you very much for the Treatment; which I am very pleased to say has improved my eyes wonderfully."

Case 17394. Mr. W. O. Age 56. Engine Driver. Sight failing and Wore Glasses for 2 years. Reports:—

"I am pleased to tell you that I have gained my old position as a main-line Driver, and I wish to thank you very much for all that you have done for me."

IF YOU SUFFER FROM

- | | |
|---------------------------------|---|
| 1. Failing or Weak Sight. | 9. Aching Eyes. |
| 2. Near Sight. | 10. Eyesight Headache. |
| 3. Old Sight or Blurred Vision. | 11. Drooping Eyelids. |
| 4. Astigmatism. | 12. Red and Inflamed Eyes. |
| 5. Twitching Eyes. | 13. Strained Sight. |
| 6. Watery Eyes. | 14. Conjunctivitis or any other eye troubles. |
| 7. Discharging Eyes. | |
| 8. Unequalled Power of Eyes. | |

**FILL IN AND POST THE SPECIAL
"WORLD-RADIO" FIRST
STEP TO PERFECT EYESIGHT
FORM TO-DAY.**

**To Mr. Ernest Havilland,
HAVILLAND EYESIGHT INSTITUTE,
33, STRAND, LONDON, W.C.2.**

Please send me a Free Copy of your Treatise on Sight Restoration.

NAME.....
(Please write clearly and say whether Mr., Mrs., Miss or other title.)

ADDRESS.....

Enclose 2d. in Stamps for Postage, Please.
World-Radio, 22/11/29.

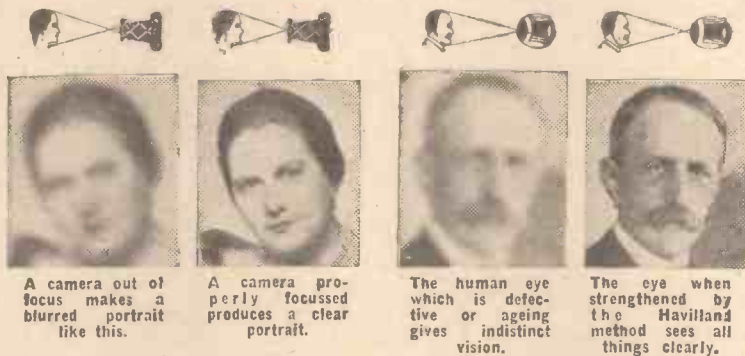
No apology is needed for drawing the attention of readers of *World-Radio* to a remarkable new method of eyesight improvement which does not entail the wearing of glasses and which everyone can carry out at trifling cost at home. Originally discovered some years ago by the well-known eyesight specialist, Mr. Ernest Havilland, it has been perfected in the light of considerable experience, so that to-day it is not put before the public untested. On the contrary, it has been "tried out" on no fewer than 35,000 cases, drawn from all classes of the community, including Doctors, Lawyers, Clergymen, Schoolmasters and Mistresses, Military Men, and others of the professional classes, as well as railway workers, postmen, sorters, sempstresses, and other workers to whom good eyesight is an absolute necessity.

ASTOUNDING RESULTS REPORTED

So astounding are the results reported that if the evidence voluntarily given by those who have put the method to a thorough trial had been advanced by Mr. Havilland only, one might think he had been carried away by his enthusiasm. But when Doctors and people making official eyesight tests have put the system to the proof, and declare that it has resulted in an extraordinary improvement in vision, then it becomes apparent that here is a method that deserves the careful and thorough consideration of everyone whose eyesight is below standard or in any way defective.

A DISCOVERY OF NATIONAL IMPORTANCE

It is impossible in a brief newspaper article to do adequate justice to Mr. Havilland's discovery, which may well claim to be of national importance. The treatment is a simple system of massage of the eyes that everyone can carry out at home, costs very little to adopt, is fully described in an



A camera out of focus makes a blurred portrait like this.

A camera properly focussed produces a clear portrait.

The human eye which is defective or ageing gives indistinct things.

The eye when strengthened by the Havilland method sees all things clearly.

invited to take immediate advantage of this valuable eyesight improvement offer, using the accompanying form.



St. Paul's as indistinctly seen by weak-sighted. | St. Paul's as it should be seen, clear and defined.

Every Weak, or Failing-sighted Reader should immediately write to or call upon Mr. Ernest Havilland, at 33, Strand, London, W.C.2, for Free Particulars of his Really Wonderful Method of Strengthening and Perfecting Impaired Sight.

ENGINE DRIVER lost his position through failing sight. After few weeks' Havilland treatment writes:—"I am glad to say I have got on the footplate this week."—L. W., of Woodhouse.

DOCTOR 70 YEARS OF AGE writes:—"I am writing this letter without spectacles, a thing I could not possibly have done two months ago."—Dr. R., of Kent.

DAVENTRY (EXPERIMENTAL) PROGRAMME

(5GB)

(626 kc/s 479.2 metres)

(November 24-30)

SUNDAY (Nov. 24th)

3.45 p.m.—Poetry Reading.
 4.15 p.m.—A Symphony Concert (From Birmingham). The Birmingham Studio Augmented Orchestra. Conducted by Joseph Lewis. Keith Falkner (Baritone). Frank Cantell (Violin). Arthur Kennedy (Viola).
 7.50 p.m.—"The Church and Civic Life." A Religious Service. Conducted by Canon Guy Rogers, M.C. Relayed from St. Martin's Parish Church, Birmingham.
 8.45 p.m.—The Week's Good Cause. An appeal on behalf of The Young Helpers League by Miss Nicholson Barton.
 8.50 p.m.—"The News." Weather Forecast, General News Bulletin.
 9.0 p.m.—Tom Jones and the Grand Hotel, Eastbourne, Orchestra. Silvio Sideli (Baritone). Orchestra: Overture, "Poet and Peasant" (Suppe); "The Voice of the Bell" (Luigini). Silvio Sideli: Torns (with Violoncello or Violin Obbligato) (Denza); Speak to me (Guy d'Hardelot). Orchestra: Suite—"Summer Days" (Eric Coates), Tom Jones (Violin); Midnight Bells (Heuberger, arr. Kreisler); Mignonette (Friml); Tango (Albeniz, arr. Kreisler). Silvio Sideli: Tu ca nun chagne (De Curtis); Marechiaro (Tosti). Orchestra: Fantasy, "Tannhäuser" (Wagner); The Lost Chord (Sullivan).
 10.30 p.m.—Epilogue (From Birmingham).

MONDAY (25)

3.0 p.m.—The Grange Super Cinema Orchestra (From Birmingham). Conducted by Haydn Heard.
 4.0 p.m.—A Ballad Concert. Mary Maddock (Soprano). Lough Gill Traditional Irish Trio.
 4.30 p.m.—Dance Music. Jack Payne and the B.B.C. Dance Orchestra.
 5.30 p.m.—The Children's Hour.
 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather

Forecast, First General News Bulletin.
 6.30 p.m.—Light Music. The Birmingham Studio Orchestra. Conducted by Frank Cantell. Barbara Frewing (Contralto). George Bone (Pianoforte).
 7.10 p.m.—Orchestra: Selection from the Works of Donizetti (arr. Urbach).
 7.25 p.m.—"Louise." A Musical Romance in Four Acts and Five Tableaux. Words and Music by Gustave Charpentier. English Translation by Edwin Evans. The Wireless Chorus. (Chorus Master, Stanford Robinson.) The Wireless Symphony Orchestra. (Leader, S. Kneale Kelley.) Conducted by Percy Pitt. Relayed from the Parlophone Studio by the courtesy of the Parlophone Company. Acts I and II (Scene 1).
 8.40 p.m.—Interval.
 8.50 p.m.—"Louise." Act II (Scene 2) and Act III.
 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
 10.15 p.m.—"Louise." Act IV.
 10.55-11.15 p.m.—Dance Music. The Piccadilly Players, directed by Al Starita, and The Piccadilly Grill Band, directed by Jerry Hoy, from the Piccadilly Hotel.

TUESDAY (26)

3.0 p.m.—Dance Music. Jack Payne and the B.B.C. Dance Orchestra.
 4.0 p.m.—From the Light Classics. The Birmingham Studio Augmented Orchestra. Conducted by Frank Cantell. Muriel Tooke (Violin). Lilian Cooper.
 5.30 p.m.—The Children's Hour.
 6.15 p.m.—"The First News." Time Signal (Greenwich); Weather Forecast, First General News Bulletin.
 6.30 p.m.—Jack Payne and the B.B.C. Dance Orchestra.
 7.0 p.m.—Light Music (From Birmingham). Pattison's Salon Orchestra. Directed by Norris Stanley.

8.0 p.m.—Roger Jalowicz and his Grande Tango Band.
 8.30 p.m.—A Recital by Maggie Teyte.
 9.0 p.m.—A Military Band Concert. Catherine Stewart (Contralto). The Wireless Military Band. Conducted by B. Walton O'Donnell. Symphonic Poem, "Vysehrad" (Smetana).
 9.18 p.m.—Catherine Stewart: When all was young (Gounod); If I had a-knew (Hughes); Morning Hymn (Henschel).
 9.26 p.m.—Band: The Apprentice Magician (Dukas).
 9.38 p.m.—Catherine Stewart: Touch not the nettle (arr. Lawson); The Nightingale has a lyre of gold (Whelpley); All through the night (arr. Somervell).
 9.46 p.m.—Band: Morceau Symphonique ("The Redemption") (Franck).
 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
 10.15-11.15 p.m.—"Roland." A Drama derived from Turol's story by E. A. Harding. With effects composed by Haley Simpson. Produced by Peter Creswell.

WEDNESDAY (27)

3.0 p.m.—A Military Band Programme (From Birmingham). The City of Birmingham Police Band. Conducted by Richard Wassell. Evelyn Crees (Contralto). Ernest Elliott.
 4.30 p.m.—Dance Music. Jack Payne and the B.B.C. Dance Orchestra.
 5.30 p.m.—The Children's Hour.
 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
 6.30 p.m.—Light Music (From Birmingham). The Birmingham Studio Orchestra. Conducted by Frank Cantell. Rita Sharpe (Violoncello).
 7.5 p.m.—Samuel Saul (Baritone). Rita Sharpe.
 7.35 p.m.—Samuel Saul.

8.0 p.m.—Symphony Concert (Sixth Season—1929-30). Marcelle Meyer (Pianoforte). The B.B.C. Symphony Orchestra. (Principal Violin, Charles Woodhouse). Conducted by Sir Thomas Beecham. Relayed from the Queen's Hall, London.
 9.5 p.m.—Reading. "Poems from the Chinese," translated by Arthur Waley. Read by Ronald Watkins.
 9.20 p.m.—Symphony Concert (continued).
 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
 10.15 p.m.—Dance Music. Teddy Brown and his Band from Ciro's Club.
 11.0-11.15 p.m.—Alan Green and his Band and Artr Gregory and his St. Louis Band, from the Royal Opera House Dances, Covent Garden.

THURSDAY (28)

3.0 p.m.—Symphony Concert. (No. VIII of the 35th Winter Series). Relayed from The Pavilion, Bournemouth. The Bournemouth Municipal Symphony Orchestra. Conducted by Sir Dan Godfrey. Overture, "The Uninhabited Island" (Haydn); Scherzo, "A Night by Dalegarth Bridge" (S. H. Braithwaite); Piano Concerto in E Minor (Chopin); Allegro maestoso; Romanze (Larghetto); Rondo (Vivace); Symphony (No. 3) in F (Dvorak). Allegro ma non troppo; Andante con moto; Allegro scherzando; Finale—Allegro molto.
 4.30 p.m.—Organ Music Played by Reginald New. Relayed from the Beaufort Cinema, Washwood Heath, Birmingham. Allan John Hill (Tenor). Reginald New.
 5.30 p.m.—The Children's Hour.
 6.15 p.m.—"The First News." Time Signal (Greenwich), Weather Forecast, First General News Bulletin.
 6.30 p.m.—Organ Recital by Dr.

Harold Rhodes. Relayed from Coventry Cathedral.
 7.0 p.m.—Jack Payne and the B.B.C. Dance Orchestra.
 7.45 p.m.—Vaudeville. Harley and Barker in Light Songs and Harmony. Olive Hibbert (Mimic). Billy Thorburn (Syncopated Pianisms). Tommy Handley (The Wireless Comedian). Arthur Ackerman and Jenny Wynne in Old-Time Songs. Frederick Chester in West Country Songs and Stories. Philip Brown's Dominoes Band.
 9.0 p.m.—Speeches following the Annual Dinner of The National Institute of Industrial Psychology. Relayed from the Hotel Victoria. H.R.H. The Duke of York and the Prime Minister, The Right Hon. J. Ramsay MacDonald, will propose the Health of the Institute. The Right Hon. Viscount D'Abernon, G.C.B., and Mr. H. J. Welch will respond. Sir Josiah Stamp, G.B.E., will propose the Health of the Guests.
 10.0 p.m.—"The Second News." Weather Forecast, Second General News Bulletin.
 10.15 p.m.—A Concert. Norah Dahl (Soprano). The Gershwin Parkington Quintet. Selections: "The Bohemian Girl" (Balfe); "Maritana" (Wallace); Warum? (Why?) (Schumann).
 10.30 p.m.—Norah Dahl: Allerseelen (All Souls' Day) and Ständchen (Serenade) (Strauss).
 10.35 p.m.—Quintet: Hungarian Rhapsody, No. 2 (Liszt); Lullaby E. Scott.
 10.52 p.m.—Norah Dahl: Nightingales (Bryson); The Tryst (Sibelius).
 11.0-11.15 p.m.—Quintet: Bourrée and Gigue (German); Londonderry Air (arr. O'Connor Morris)

FRIDAY (29)

3.0 p.m.—Organ Music. Played by Leonard H. Warner. Relayed from St. Botolph's, Bishopsgate. (Continued on page 829.)

PROGRAMMES FOR SUNDAY (November 24)

The Frequencies and Wavelengths given in the following programmes are those published by the stations in question. For more accurate measurements, readers are referred to our Table of Frequencies and Wavelengths.

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)

Radio-Barcelona (EA 1). 860 kc/s (349 m.); 8 kw.
 11.0 a.m.—Chimes and Weather.
 1.0 p.m.—Gramophone Concert, followed by Barcelona Exhibition Notes.
 3.0-5.30 p.m.—No Transmission.
 5.30 p.m.—Partial Relay of an Opera from the Gran Teatro del Liceo.
 8.0 p.m.—Agricultural Talk.
 8.15 p.m.—Talk: Great Men of Spain—Mariano Fortuny.
 8.30 p.m.—Orchestral Selections: (a) Córdoba en fiesta, and (b) En la Giralda (Turina).
 8.40 p.m.—Sports Notes.
 9.0 p.m. (approx.)—Close Down.

BELGRADE (Yugoslavia)

609 kc/s (429 m.); 2.5 kw.
 8.0 a.m.—Service from the Saborna Crkva.
 9.30 a.m.—Gramophone Concert, followed by Relay of the Changing of the Guard from the Royal Palace.
 11.20 a.m.—Quartet Concert. Overture, "Raymond" (Thomas). Ich liebe Dich, and A Wedding Day on Troldhaugen (Grieg). Ave Maria (Bach-Gounod). Danse macabre (Saint-Saëns). Selection from "Madame Butterfly" (Puccini).
 12.30 p.m.—News Bulletin.
 12.40 p.m.—Agricultural Talks.
 4.30 p.m.—Concert by a Children's Choir.
 5.15 p.m.—First Relay from the Belgrade National University. Talk: The Annexation of Bosnia and Herzegovina.
 7.50 p.m.—Yugoslavian Concert.
 8.50 p.m.—Time and News.
 9.0 p.m.—Evening Concert.
 9.45 p.m.—Dance Music from the Palace Hotel, Belgrade.

BERLIN (Germany)

Königswusterhausen. 183 kc/s (1,635 m.); 26 kw.
 6.0 a.m.—5.0 p.m.—Programme relayed from Berlin (Witzleben).
 5.0 p.m.—Talk: Good People.
 5.50 p.m.—Talk: The German Dead buried in Foreign Lands.
 6.15 p.m.—"The Fool and Death" (Hofmannsthal), with introductory Talk.
 7.0 p.m.—Programme relayed from Berlin (Witzleben).

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.5 kw.
 6.0 a.m.—Wireless Gymnastics.
 7.30 a.m.—Gardening Talk: The Cultivation of Cemeteries.
 7.55 a.m.—Chimes from the Potsdam Garrison Church.
 8.0 a.m.—Morning Recital, followed by Berlin Cathedral Chimes.
 9.0 a.m.—Weather Forecast.
 9.50 a.m.—Transmission of Pictures—a Sketch of Matthias Grünewald.
 10.0 a.m.—Talk for Parents.
 10.30 a.m.—Gramophone Concert.
 11.30 a.m.—Reading: Letters of Soldiers killed in Action.
 12 noon.—Vocal and Instrumental Concert.

1.0 p.m.—Programme for Children. Reading of Fairy Tales.
 2.30 p.m.—Baritone Song Recital.
 3.30 p.m.—Chamber Music. String Quartet K.493 (Mozart). 'Cello Solos: (a) Adagio (Haydn), (b) Adagio and (c) Andante (Bach) String Quartet, Op. 59, No. 1 (Beethoven).
 5.0 p.m.—Reading: "The Struggle for the South Pole" (Captain Scott's Expedition, January 1912), by Stefan Zweig.
 5.40 p.m.—Max Reger Organ Recital.
 6.25 p.m.—"Requiem" (Theodore Dreiser)—Recitations to Music.
 7.0 p.m.—Symphony Concert. Adagio from the Ninth Symphony (Mahler). Baritone Solos: Kinder-totenlieder (Mahler): (a) Nun will

die Sonn' so hell aufgehn, (b) Nun seh' ich wohl, warum so dunkle Flammen, (c) Wenn dein Mütterlein, (d) Oft denk' ich, sie sind nur ausgegangen, (e) In diesem Wetter. The Seventh Symphony in E Major (Bruckner). In the interval, Ten Minutes' Talk on Tolstoi. After the Programme, Time, Weather, News, Sports Notes and Picture Transmission.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1 kw.
 Transmits at intervals from 9.30 a.m. 6.28 p.m.—Time and Weather.
 6.30 p.m.—"The Development of Music for Solo Violin," played and explained by Herr H. Blume. Concerto in E Major (Bach). Sonata "Il Trillo del Diavolo" (Tartini).
 7.30 p.m.—Concert of Tenor and Baritone Duets and Orchestral Music.
 9.0 p.m.—Sports Notes, News and Weather.
 9.15 p.m.—Orchestral Music.
 9.40 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 12.5 kw.
 8.0 a.m.—Programme from Prague.
 9.0 a.m.—Talk: The Flax Industry.
 9.30 a.m.—Programme from Prague.
 10.0 a.m.—Concert from Brno (See Prague).
 11.0 a.m.—Programme from Prague.
 3.0 p.m.—Orchestral Concert.
 4.30 p.m.—Programme from Prague.
 5.0 p.m.—"Mrs. Williams and the Hurricane"—Drama, followed by Talk.
 6.0 p.m.—Recital of Slovakian Songs from Kosice, 1,022 kc/s; (293 m.).
 7.0 p.m.—Orchestral Concert.
 8.0 p.m.—Programme from Prague.
 9.15 p.m.—Concert from the Café Slavia, Kosice.
 9.55 p.m.—Programme Announcements and News.

BRESLAU (Germany)

923 kc/s (325 m.); 2 kw. Relayed by Gleiwitz, 1,184 kc/s (253 m.).
 7.45 a.m.—Electrola Concert.
 8.15 a.m.—Christ Church Chimes.
 8.30 a.m.—Concert (continued).
 10.0 a.m.—Evangelical Recital.
 11.0 a.m.—Concert from the Works of Bach.
 1.0 p.m.—Talk on Gardening.
 1.10 p.m.—Talk: Solemn Words on a Solemn Day.
 1.35 p.m.—Talk for Chess Players.
 2.0 p.m.—Agricultural Talk.
 2.25 p.m.—Programme for Children.
 2.45 p.m.—Talk: The Watch by the Graves of German Soldiers.
 3.10 p.m.—Sacred Song Recital.
 3.45 p.m.—Recitations from the Works of Dead or Missing Poets.
 4.20 p.m. (from Gleiwitz).—Suite in D Minor for two 'Cellos (Klengel).
 4.50 p.m.—Talk on Philosophy.
 5.15 p.m.—Harmonium Recital.
 5.45 p.m.—Talk: Weapons in the Struggle of Life.
 6.10 p.m. (from Gleiwitz).—The Indian Raj Behari Lal Nathur talks on his Native Land.
 6.35 p.m.—Weather for Farmers.
 6.37 p.m.—Talk: The Way of Man-kind.
 7.0 p.m.—Weather Forecast.
 7.2 p.m.—"In Memoriam"—Programme of Gramophone Music.
 7.30 p.m.—"Imi"—A Wireless Oratorio (F. K. Hoefler).
 9.10 p.m.—News Bulletin.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1 kw.
 3.0 p.m.—Concert by the Symphonic Concert Society of the Charleroi Conservatoire.
 5.0 p.m.—Concert relayed from the Armonovilla Tea Rooms.
 6.0 p.m.—Programme for Children.
 6.30 p.m.—Gramophone Records.
 7.30 p.m.—Le Journal parlé.
 8.15 p.m.—Concert in celebration of the Sixth Anniversary of Radio-Belgique. Repetition of the Inaugural Programme of November 24th, 1923. Rapsodie Dhoméenne (De Boeck). The Dream from "Manon" (Massenet). Marche fantasque (Gilsen). Overture, "Cosi fan

tutte" (Mozart). Aria from "Alceste" (Gluck). Scènes affasciennes (Massenet). Talk. Danse macabre (Saint-Saëns). Mailed (Hubert). Le colibri (Chausson). Flower Waltz (Tchaikovsky). Romance for Flute (Bernard). Air from "Louise" (Charpentier). A Wedding Day on Troldhaugen (Grieg).
 10.15 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 20 kw.
 8.0 a.m.—News; Beauty Hints.
 9.0 a.m.—Protestant Service from the Church in the Kalvinplatz.
 10.20 a.m.—Time and Weather.
 10.30 a.m.—Orchestral Concert. Overture, "Christelfein" (Pfitzer). Concerto for Pianoforte in C Minor (Rachmaninoff). First Symphony (Tchaikovsky).
 2.30 p.m.—Agricultural Talk.
 3.0 p.m.—Choral Selections and Talks, followed by Time and Weather.
 4.15 p.m.—Concert from Debrecen.
 6.15 p.m. (approx.)—Sports and Racing Notes.
 6.30 p.m.—Arpád Odrys Recital.
 7.30 p.m.—Dance Music Programme.
 8.20 p.m.—Violin Recital.
 9.10 p.m. (approx.)—Time and Weather, followed by Concert of Tzigane Music from the Café Spolarich.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw. See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 0.75 kw. Relayed by Kalundborg, 260 kc/s (1,153 m.).
 9.0 a.m.—Divine Service from the Elias Church. Preacher: A. Fibiger.
 10.30 a.m.—Meteorological Report (For Kalundborg only).
 10.50 a.m.—News Bulletin.
 11.0 a.m.—Town Hall Chimes.
 11.2 a.m.—Instrumental Concert. 12 (noon).—Language Lesson.
 1.0 p.m.—Divine Service from the Garrison Church.
 2.30 p.m.—Concert of Trio Music

Programmes for Sunday—(Cont.)

and Songs. Programme from the Works of Beethoven, Saint-Saëns and Norwegian Composers.

4.30 p.m.—Programme for Children. 5.0 p.m.—Town Hall Chimes.

5.50 p.m.—Meteorological Report. 6.0 p.m.—News Bulletin.

6.15 p.m.—Time Signal. 6.16 p.m.—Sports Notes.

6.30 p.m.—Talk: Excavations in Palestine and the Neighbouring Lands.

7.0 p.m.—Town Hall Chimes. 7.2 p.m.—Orchestral Concert. Dansk Radiofonon-Honnormarch (Wantzin).

Overture, "William Tell" (Rossini). Waltz, Wiener Bonbons (Joh. Strauss). Mazurka (Joh. Strauss).

Brudefaerden i Hardanger (Kjerulf). Polonaise for "His Life for the Czar" (Glinski). March, Don Cesar (Dellinger).

7.45 p.m.—From Danish Folk Life. Talk, Readings and Selections for Strings and Wood-Wind Instruments.

8.45 p.m.—Concert of Light Music. 9.45 p.m.—Dance Music from the Palace Hotel.

11.0 p.m. (in the interval).—Town Hall Chimes. 11.30 p.m. (approx.).—Close Down.

CORK (Ireland)

(6CK). 1,137 kc/s (225 m.); 1 kw. 8.30 p.m.—Time Signal.

8.32 p.m.—Vocal and Instrumental Concert. 11.0 p.m.—National Anthem, Time, Weather and Close Down.

CRACOW (Poland)

Polskie Radio. 959 kc/s (313 m.); 0.5 kw.

Transmits at intervals from 9.15 p.m. 6.40 p.m.—Miscellaneous Notes and News.

6.58 p.m.—Time Signal. 7.0 p.m.—Humorous Programme. 7.30 p.m.—Instrumental and Vocal Concert. In an interval at 8.10 p.m. (approx.).—Literary Programme from Warsaw.

9.0 p.m.—Reading. 9.15 p.m.—News from Warsaw. 10.0 p.m.—Concert relayed from the Pavilion Restaurant.

11.0 p.m.—Chimes from Notre Dame and Close Down.

DUBLIN (Ireland)

(2RN) 725 kc/s (413 m.); 1 kw. 8.30—11.0 p.m.—See Cork.

11.0 p.m.—Weather Report, Time, National Anthem and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.5 kw. Relayed by Cassel, 1,220 kc/s (246 m.).

7.15 a.m.—Evangelical Remembrance Day Service with "Musikalische Exequien" in Three Parts (Heinrich Schütz), for Soloists, Choir and Organ.

9.30 a.m.—Youth-Movement Programme.—Talk: The International Scout Movement and the Problems confronting it.

10.0 a.m.—Talk for Parents. 10.30 a.m.—Programme for Children.—The Story of Sinbad the Sailor, from the "Arabian Nights."

11.0 a.m. (from Cassel).—Orchestral Concert. 12 noon.—Talk arranged by the Wiesbaden Board of Agriculture.

12.20 p.m.—Concert by the Workers' Choral Society "Freedom," relayed from Münster bei Dieburg. 1.30 p.m.—See Stuttgart.

3.30 p.m.—Bruno Eisner Pianoforte Recital. Sonata (Beethoven). Sonata (Rathaus). Four Preludes (Debussy).

4.10 p.m.—Two Agricultural Talks. 5.10 p.m.—Talk: Mutual Co-operation between Germany and Austria.

5.40 p.m.—Talk: A Visit to the German War Graves in France. 6.0 p.m.—Talk: Theatre Policy.

6.30 p.m.—Sports Notes. 7.0 p.m.—Concert, relayed from Flörsheim.

8.30 p.m.—Concert. Divertimento, No. 11 (Mozart). Tenor Solos: Kindertotenlieder (Mahler). Symphony in G Minor (Mozart).

10.0 p.m.—Talk by Friedrich Kropp

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relayed by Bremen, 941 kc/s (310 m.).

Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).

7.15 a.m.—Time, Weather News and Programme Announcements. 7.40 a.m.—Talk on Topical Questions: Private Railways in North Germany.

8.0 a.m. (from Hanover).—Talk: Amendments to the Laws on Settlements and Unemployment Insurance.

8.20 a.m.—Funeral Songs, Lamentations and Dirges of Other Nations. 9.15 a.m. (from Bremen).—Service in Memory of the Dead, relayed from Bremen Cathedral.

10.30 a.m.—Talk: The Mystery of Death as represented in the Beliefs of People of Distant Lands. 11.0 a.m.—Talk: Prince von Bülow.

11.20 a.m. (from Hanover).—Orchestral Concert. 12.0 noon.—Organ Recital dedicated to the Memory of Great Organists. Selections from the Works of Bach, Händel, Franck and Reger.

1.0 p.m.—Music for Children. 2.0 p.m.—Remembrance Day Concert. 3.30 p.m. (from Kiel).—Orchestral Concert.

5.0 p.m. (from Hanover).—Organ Recital and Male Voice Choir Selections, relayed from the Cathedral of Henry the Lion, in Brunswick.

6.0 p.m.—Reading from the Letters of German Students killed in Action. 6.30 p.m.—Talk: Gymnastics. 6.40 p.m.—Sports Notes & Weather. 7.0 p.m. (from Kiel).—"Requiem in C minor," for Mixed Choir and Orchestra (Cherubini), relayed from the St. Jürgen-Kirche.

8.15 p.m.—"The Wonder-working Beggars"—Wireless Play in Four Pictures, in the Style of an Old Russian Legend (Erik Brädt—Music by Paul Blume).

9.30 p.m.—Talks, News, Weather Report, Sports and Miscellaneous Announcements. 10.0 p.m.—Quartet Concert of Sacred Music.

HILVERSUM (Holland)

1,004 kc/s (298 m.). After 5.40 p.m., 280 kc/s (1,071 m.); 0.5 kw. 8.40 a.m.—11.40 a.m.—Programme of the Workers' Radio Society (V.A.R.A.).

8.40 a.m.—News in Esperanto and Dutch. 8.55 a.m.—Organ Recital. 9.0 a.m.—Address by Mr. Laan. 9.15 a.m.—Organ Recital. 9.25 a.m.—Talk by Mr. Kuper. 9.40 a.m.—Talk by Mr. R. A. Gorter. 9.55 a.m.—Organ Recital. 10.10 a.m.—Orchestral Concert with Choral Selections. 11.40 a.m.—4.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 11.40 a.m.—Time Signal; Talk. 12.20 p.m.—Octet Concert. Overture, "Ali Baba" (Cherubini). Serenade for Strings in E Major, Op. 20 (Elgar). Réve (d'Ambrosio). La lettre d'amour (Stewart). Slavonic Dances Nos. 10 and 7 (Dvorák). Serenade for Cello (Lacôme). Tango (Albéniz). Waltz, Diesen Kuss der ganzen Welt (Ziehrer). Selection from "Friederike" (Lehár).

1.40 p.m.—Dramatic Criticism. 2.10 p.m.—Concert relayed from the Concert Hall, Amsterdam. 3.40 p.m.—Gramophone Records; Sports Notes. 4.40—7.40 p.m.—Programme of the V.A.R.A. 4.40 p.m.—Weekly News. 4.55 p.m.—Programme for Children. 7.40—11.40 p.m.—A.V.R.O. Programme. 7.40 p.m.—Time, Weather and News. 7.55 p.m.—"Mireille"—Opera in Five Acts (Gounod) followed by Gramophone Records. 11.40 p.m. (approx.).—Close down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 6.5 kw. 8.10—9.10 a.m.—Programme of the Catholic Radio Society (K.R.O.). Sacred Recital and Address by Mr. Paule de Waart. 9.10 a.m.—Programme of the Christian Radio Society (N.C.R.V.). Divine Service from the Reformed Church at Amsterdam. Preacher: The Rev. G. Goede. 12.10—1.40 p.m.—Programme of the K.R.O. 12.10 p.m.—Trio Concert. 1.10 p.m.—Religious Instruction. 1.40 p.m.—Talk on Literature. 2.10 p.m.—Concert by a String Orchestra. 4.10 p.m.—Programme for Hospitals. 4.40—5.30 p.m.—No Transmission. 5.30 p.m.—N.C.R.V. Programme. Divine Service relayed from the Free Evangelical Society's Church at Nijverdal. Preacher: The Rev. P. B. Müller. 7.10 p.m.—Close Down.—K.R.O. Programme. 7.11 p.m.—Talk by Mr. Huib Luns. 7.41 p.m.—Talk by the Rev. Perquin, President of the K.R.O. 7.50 p.m.—K.R.O. Orchestral Concert. Overture, "Manfred" (Schumann). Largo from the Symphony, From the New World

(Dvorák). Second Song Suite (Brahms). Duet from "Boris Godounoff" (Moussorgsky). Selection from "Manon Lescaut" (Puccini). Voice and Orchestra: Aria from "Lucia di Lammermoor" (Donizetti). 8.50 p.m.—Gramophone Records and News. 9.10 p.m.—Concert (continued). Overture, "The Merry Wives of Windsor" (Nicolai). Ballet Music from "Coppélia" (Delibes). Songs with Orchestral Accompaniment: (a) Queen of the Night from "The Magic Flute" (Mozart), (b) Aria from "Mignon" (Thomas). Piedmontese Dance (Sinigaglia). Waltz, "Très jolie (Waldteufel). Perpetuum mobile (Strauss).

10.25 p.m.—Epilogue by the Choir. 10.40 p.m. (approx.).—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw. See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408.7 m.); 10 kw. 9.15 a.m.—Programme not yet announced, relayed from Wilno, 770 kc/s (385 m.). 10.58 a.m.—Time; Chimes; Weather. 11.10 a.m.—Concert by the Philharmonic Society, relayed from Warsaw. 2.0 p.m.—Agricultural Talk. 2.20 p.m.—Religious Address. 2.40 p.m.—Agricultural Talk. 3.0 p.m.—Orchestral Concert. 4.20 p.m.—Talk for Chess-Players. 4.45 p.m.—Concert from Warsaw. 6.0 p.m.—Miscellaneous and Programme Announcements and Theatre Review. 6.20 p.m.—Musical Selections. 6.30 p.m.—Variety Programme. 6.58 p.m.—Time Signal. 7.0 p.m.—Literary Programme. 7.30 p.m.—Concert from Warsaw. 8.10 p.m.—Literary Programme. 8.25 p.m.—Concert (continued). 9.0 p.m.—Reading. 9.15 p.m.—Weather, Sports Notes, Programme Announcements in French and News. 9.35 p.m.—News Bulletin. 10.0 p.m.—Dance Music.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relayed by Danzig, 662 kc/s (453 m.). 9.0 a.m.—Divine Service, relayed from the Burgkirche. 11.0 a.m.—Trombone Recital of Sacred Music. 11.55 a.m.—Nauen Time Signal; Weather. 1.0 p.m.—Memorial Service for the Dead. 2.0 p.m.—Gramophone Concert of Sacred Music. 2.40 p.m.—Programme for Children. 3.10 p.m.—Talk: "The Functions and Tasks of the German War Graves' Commission. 3.35 p.m.—Concert arranged by the National Society of Disabled and Ex-Service Men, relayed from the Town Hall. Overture, Leonora No. 3 (Beethoven). Recitation: To the Soldiers of the Great War (Gerrit Engelke). Symphony in C Minor, No. 4 (Schubert). Memorial Address. Symphonic Poem, Death and Transfiguration (Richard Strauss). 5.30 p.m.—Talk: A Journey to Turkey. 6.10 p.m.—Talk: The Significance to Future Generations of Old German Sacred and Secular Folk Songs. 7.0 p.m.—"Requiem for Poets killed in Action."—Music and Recitations. 9.10 p.m. (approx.).—News, Sports, Notes and Silent Night.

LAHTI (Finland)

167 kc/s (1,800 m.); 4c kw. Relayed by Helsinki, 1,357 kc/s (221 m.). 6.15 a.m.—Exercises for Women. 7.0 a.m.—Divine Service. 8.45 a.m.—News Bulletin. 9.0 a.m.—Gramophone Records. 9.40 a.m.—Recital of Songs. 10.5 a.m.—Pianoforte Recital: Preludes from "Das wohltemperierte Klavier" (Bach). 10.50 a.m.—Weather and Time. 12.30 p.m.—Popular Concert. 12.30 p.m.—Gramophone Concert. 4.10 p.m.—Talk by Madame I. Hallsten. 4.35 p.m.—Recital of Songs. Aria from "Elijah" (Mendelssohn). Tule Mokseni, Herra Jesus (Hannikainen). Song (Händel). Sacred Song (Bach). 4.50 p.m.—Time and Weather. 5.10 p.m.—Orchestral Programme. March, Fest und Treu (Fucik). Viennese Waltzes and Songs (Härsch). Russian Suite, An

Evening in St. Petersburg (Meyer-Helmund). 5.30 p.m.—Talk by Prof. Voionmaa. 6.0 p.m.—Concert of Sacred Music from St. John's Church. 7.15 p.m.—Concert of Popular Music. 7.45 p.m.—News in Finnish. 8.05 p.m.—News in Swedish.

LANGENBERG (Germany) Westdeutscher Rundfunk. 635 kc/s (473 m.); 13 kw. Relayed by Aix-la-Chapelle, 662 kc/s (453 m.); Cologne, 1,319 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.). 6.0 a.m.—Gramophone Concert. 7.10 a.m.—Lesson in Self-defence. 7.30 a.m.—Programme Announcements and Talk in Esperanto. 8.0 a.m.—Trinity Church Chimes, relayed from Cologne. 8.5 a.m.—Evangelical Recital. 9.15 a.m.—Programme for Hospitals. 10.0 a.m.—Talk: The German Language.

10.35 a.m.—Programme by the Berlin University Verse-Speaking Choir, with the collaboration of the Station Orchestra. Talisman (Goethe). Harzreise im Winter (Goethe). Die Entschlafenen, and Hyperions Schicksalslied (Hölderlin). 11.30 a.m.—Talk: A Visit to War Graves in Northern France. 12 noon.—Organ Recital, relayed from the Tonhalle, Düsseldorf. 1.30 p.m.—Wireless Literature. 1.50 p.m.—Talk for Chess Players. 2.10 p.m.—Shorthand Speed Tests. 2.40 p.m.—Talk: Workers' Musical Societies. 3.5 p.m.—Talk: Income Tax. 3.30 p.m.—Orchestral Concert with Contralto Solos. 5.0 p.m.—Talk: The Age in Books. 5.25 p.m.—Agricultural Talk. 5.50 p.m.—Talk for Workers: Men and their Callings.—The Fireman. 6.10 p.m.—Talk: Social Politics in Austria Since the War. 6.35 p.m.—Talk: The Young People's "Cross of Peace" Procession. 7.0 p.m.—Sports Announcements. 7.15 p.m.—Organ Recital, with Vocal and Violin Selections, relayed from the St. Reinoldikirche, followed by News, Sports Notes and Silent Night.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relayed by Dresden, 941 kc/s (319 m.). 7.30 a.m.—Organ Recital, relayed from the Marktkirche, Halle a. S. 8.0 a.m.—Morning Concert. 10.0 a.m.—Talk: German War Graves in France and Belgium. 10.30 a.m.—Symphony Concert, followed by Weather and Time. 12 noon.—Gramophone Records. 1.0 p.m.—Talk: Current Events. 1.45 p.m.—Choral Concert by the Dresden Madrigal Society. 2.15 p.m.—Reading from the Novel "Jean Christophe" (Romain Rolland). 2.45 p.m.—Chamber Music. 3.15 p.m.—"Free Servants"—Play in Three Acts (Frank). 4.15 p.m.—Concert of Works by Composers who fell in the Great War. Tenor Solos: (a) Regen, (b) Unerreichbar, (c) Seliger Eingang, (d) Der Feind, (e) Frühlingsankunft (Jürgens). Sonata in B Minor for Viola and Piano (Kuhn). 5.0 p.m.—Wilhelm-von Scholz reads from his own Works. 5.30 p.m.—Talk: The Importance of Musical Training in the General Education of the People. 6.0 p.m.—"Requiem" for Solo Voices, Choir and Orchestra (Verdi). 8.0 p.m.—Debate: Progress or Decline—a Crisis in Culture. 8.30 p.m.—Sonata Recital. 9.15 p.m.—Time Signal, News and Sports Notes. 9.30 p.m.—Silent Night.

LJUBLJANA (Yugoslavia)

Radio Ljubljana 530 kc/s (566 m.); 2.5 kw. 8.30 a.m.—Divine Service. 9.0 a.m.—Religious Address. 9.20 a.m.—Agricultural Talk. 10.0 a.m.—Orchestral Concert. 2.0 p.m.—Talk: Dairies. 2.30 p.m.—Variety Programme. 3.0 p.m.—Gramophone Selections. 3.30 p.m.—Humorous Reading. 4.0 p.m.—Concert of Light Music. 7.0 p.m.—Programme (not yet announced), relayed from Zagreb, 973 kc/s (308 m.). 9.0 p.m.—Time, News Bulletin and Dance Music. 10.0 p.m.—Programme Announcements.

MADRID (Spain)

Union Radio (EJA 7). 707 kc/s (424 m.); 2 kw. 11.30 a.m.—Municipal Band Concert relayed from the Retiro (Weather permitting).

2.0 p.m.—Chimes, Time and Concert. Overture, "Paraphrase III" (Suppé). Romanza andaluza (Sarasate). March of the Dwarfs (Grieg). Selections from "Carmen" (Bizet). Selection from "Werther" (Massenet). Recitations: (a) Ideal, (b) Andante (del Palacio). Turkish March (Mozart). Songs: Vieni sul mar (Vergine). Selection from "La viejeita" (Caballero). Waltz, The Blue Danube (Strauss). Selection from "Portuguese Song" (Filippi da Silva). 3.30—7.0 p.m.—No Transmission. 7.0 p.m.—Chimes and Dance Music. 8.30—10.0 p.m.—No Transmission. 10.0 p.m.—Chimes, Time and Orchestral Concert relayed from the Hotel Nacional. Sports Notes in the interval. 12.0 midnight.—Dance Music. 12.30 a.m. (Monday).—Close Down.

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 7 kw. 9.15 a.m.—Wireless Notes. 9.30 a.m.—Reading from the Gospel. 9.45 a.m.—Sacred Music. 11.30 a.m.—Station Concert. 3.0 p.m.—A Comedy. 3.30 p.m.—Sports Notes. 3.40 p.m.—Light Concert. Leggenda valacca (Braga). Soprano Solos: Old Songs (Bizet). Portami via (Tirindelli). 7.0 p.m.—Club Notes. 7.15 p.m.—Wireless Notes and News. 7.30 p.m.—Time Signal. 7.32 p.m.—Symphony Concert. Third catta pastorale (Pasquini). Third Symphony (Brahms). L'incantatore di uccelli (Boschi). La ronda (Boschi). Parlo! (Ricci Signorini). Suite in the Form of Variations (Toni). Talks in the intervals.

MORAVSKA-OSTRAVA (Czechoslovakia) 1,139 kc/s (263 m.); 10 kw. 8.0 a.m.—Programme from Prague. 10.0 a.m.—Programme from Brno (see Prague). 11.0 a.m.—Programme from Prague. 3.0 p.m.—Programme from Bratislava. 4.30 p.m.—Programme from Prague. 6.0 p.m.—Programme from Brno, 878 kc/s (342 m.). Concert from the Works of Dvorák, followed by Talk: Impressions of the American Philological Congress and Play—"The St. Nicholas Fair" (Rypar). 9.0.—Programme from Prague. 9.15 p.m.—Band Concert from Brno. 9.55 p.m.—Programme and Miscellaneous Announcements: Theatre Review.

MOTALA (Sweden) 223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

MUNICH (Germany) 563 kc/s (533 m.); 1.5 kw. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.). 10.0 a.m.—Chimes and Weather. 10.15 a.m.—Morning Recital from the Works of Mozart, relayed from the Phobus-Palast. Kyrie, for Choir and Orchestra. Sub tuum praesidium—Offertory for Soprano and Tenor. Davidde penitente for Soloists, Choir and Orchestra. 12 noon.—Time, Weather and Programme Announcements. 12.15 p.m.—Agricultural Talk. 12.45 p.m.—Talk for Chess-Players. 1.30 p.m.—Gramophone Records. 1.45 p.m.—Relay of the Final of the Bavarian Championship of Men's Flat Racing from the Dagfling Racecourse. 2.30 p.m.—Talk: The Practical Woman. 2.50 p.m.—Quartet Concert from Nürnberg. 4.20 p.m.—A Fairy Play for Young People. 5.0 p.m.—Talk: Arabian Music in Egypt, with Illustrations. 5.30 p.m.—Talk: Men of Genius and the Love of Animals. 6.0 p.m.—Orchestral Concert. Overture, "La Clochette de l'Ermitte" (Maillart). Pastoral and Polka from the Poetic Suite (Dvorák). Gerda Maurus and Klaus Pohl talk on their Work in the Film Studio. Selection from "Iolanthe" (Tchaikovsky). Selection from "The Evangelist" (Kienzl). 7.0 p.m.—Weather; Sports Notes. 7.5 p.m.—"Die Trutzige"—Pasant Comedy in Three Acts (Anzengruber). 8.40 p.m.—"Night and Dreams"—A Wireless Suite of Lyrics and Music. 9.20 p.m.—News Bulletin. 9.45 p.m.—Trizane Music relayed from Budapest. 11.0 p.m. (approx.).—Close Down.

Programmes for Sunday—(Cont.)

PARIS (France)

Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw. Transmits at intervals from 8.0 a.m. 6.30 p.m.—Radio-Journal de France. 8.0 p.m.—Sports Results. 8.30 p.m.—Talk arranged by the Union des Grandes Associations. 8.45 p.m.—Concert, conducted by Mario Cazes, followed by News, Time and Weather.

PARIS (France)

Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw. 7.50 a.m.—Time Signal on 9,231 kc/s (32.5 m.). 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.). 4.30 p.m.—Pandeloup Concert. 7.10 p.m.—Meteorological Forecast. 7.20 p.m.—Le Journal Parlé. 7.50 p.m.—"Le Jardin de Jenny"—Wireless Comedy, and "Les Illusions perdues"—Domestic Sketch after Balzac. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.). 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)

Petit Parisien. 914 kc/s (329 m.); 0.5 kw. 8.30 p.m.—Transmission of Pictures. 8.45 p.m.—Gramophone Records, Talk and News Bulletin. 9.0 p.m.—Concert. Overture, "Rienzi" (Wagner); Bassoon Solo: Entr'acte from the Second Act of "Carmen" (Bizet). Poco sostenuto from the Seventh Symphony (Beethoven). The Ball at Capulet's, from "Romeo and Juliet" (Berlioz). Ballet Music from "Coppélia" (Delibes). Waltz Suite (Brahms). Slavonic March (Tchaikovsky).

PARIS (France)

Radio-Paris. (CFR). 174 kc/s (1,725 m.); 12 kw. 8.0 a.m.—News; Press Review. 8.30 a.m.—Physical Culture Lesson. 12 noon.—Religious Address by the Reverend Father Lhande, and Concert of Sacred Music. 12.45 p.m.—News Bulletin. 1.0 p.m.—Gramophone Concert. In the interval, Bilboquet as a Butcher.

2.0-3.0 p.m.—Concert of Decca Records.

4.30 p.m.—The Five O'clock Odéon. News in the interval. 6.0 p.m.—Agricultural Report and Racing Results.

6.30 p.m.—Gramophone Concert. 7.0 p.m.—Economic Notes and News. 7.15 p.m.—Gramophone Records. 7.30 p.m.—Radio-Paris Circus. 8.0 p.m.—Concert. Symphony Music. "La Serva Padrona"—Opera (Pergolesi). In the interval, at 8.30 p.m.—Sports Notes and News. 9.0 p.m.—Revelation Concert. In the interval at 9.15 p.m., Press Review, News and Time Signal

POSEN (Poland)

896 kc/s (335 m.); 1.2 kw. Transmits at intervals from 9.15 a.m. 7.0 p.m.—Programme from Cracow. 7.30 p.m.—Vocal and Instrumental Concert on the occasion of an Austrian National Festival Theatre and Station Notes in the intervals. 9.0 p.m.—Time, Sports Notes. 9.30 p.m.—Transmission of Pictures. 10.0 p.m.—Dance Music, relayed from the Carlton Restaurant. 11.0 p.m. (approx.)—Close Down.

PRAGUE (Czechoslovakia)

Strasnice. 617 kc/s (487 m.); 5 kw. 8.0 a.m.—Concert of Sacred Music: "Missa solemnis" (Mechura). 9.0 a.m.—Agricultural Report. 9.30 a.m.—Agricultural Talk. 10.0 a.m.—Concert from the Works of Axman, relayed from Brno, 878 kc/s (342 m.). 11.0 a.m.—Brass Band Concert. 12.0 noon.—Gramophone Records. 12.30 p.m.—Economic Report. 12.40 p.m.—Talk: Forty Years of Insurance against Accidents. 3.0 p.m.—Programme from Bratislava. 4.30 p.m.—Programme for Workers. 5.0 p.m.—German Transmission—News and Songs by Beethoven, Schubert and Schumann. 5.40 p.m.—Sports Announcements. 6.0 p.m.—Banjo and Mandoline Recital. 6.45 p.m.—Talk: The Second Centenary of the Birth of the Russian Marshal Souvaroff. 7.0 p.m.—(From Brno) "The St. Nicholas Fair"—Play (Rypar).

8.0 p.m.—Orchestral Concert. 9.0 p.m.—Time, News and Sports Notes. 9.15 p.m.—Military Band Concert from Brno. 9.55 p.m.—News, Programme Announcements and Theatre Notes.

ROME (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw. 9.0 a.m.—Vocal and Instrumental Concert of Sacred Music. 12 noon.—Quintet Selections. 4.0 p.m.—Variety Concert. 7.20 p.m.—Sports Notes. 7.30 p.m.—News and Press Review. 8.0 p.m.—Time Signal. 8.2 p.m.—"Falstaff"—Opera in Three Acts (Verdi). In the intervals, Talk: Goldoni at Rome, and Reading. 10.5 p.m.—News Bulletin. 10.10 p.m. (approx.)—Close Down.

STOCKHOLM (Sweden)

Radiotjänst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayd by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.). 9.30 a.m.—Talk by the Rev. Yngve Hugo. 10.0 a.m.—High Mass from the Storkyrkan. Preacher: Pastor Joh. V. Johansson. 11.45 a.m.—Weather Report. 12.30 p.m.—Symphony Concert from Malmö, 1,301 kc/s (231 m.). Symphony No. 2 in D Major, Op. 73 (Brahms). Concerto for Piano-forte and Orchestra in A Minor, Op. 16 (Grieg). Swedish Rhapsody, Midsommarvaka (Alfvén). 2.30 p.m.—Programme for Children. 3.30 p.m.—Military Band Concert. Overture, "Die schöne Galathée" (Suppé). Suite from "Coppélia" (Delibes). Selections from "Nero" (Boito). Overture, "Oberon" (Weber). 4.30 p.m.—Reading of Poems. 5.0 p.m.—Divine Service from the Emmanuel Church, Göteborg. 6.15 p.m.—"Love"—A Play in Three Acts (Géraldy). 7.30 p.m.—Sonata pathétique, Op. 13, in C Minor for Pianoforte (Beethoven).

7.45 p.m.—Choral Concert relayed from Halmstad, 1,391 kc/s (216 m.). 8.15 p.m.—News and Weather. 8.40 p.m.—Concert and Dance Music. 10.0 p.m. (approx.)—Close Down.

STUTT GART (Germany)

Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayd by Freiburg, 527 kc/s (570 m.). 10.15 a.m.—Evangelical Service. 11.0 a.m.—Recital of Sacred Music relayed from Karlsruhe. 12.0 noon.—Remembrance Sunday Gramophone Concert. 1.0 p.m.—Programme for Children. —Reading from Hans Andersen's Fairy Tales. 1.30 p.m.—"Our Homeland"—IX, A Visit to the Abbey of Beuron. 3.30 p.m.—Sec Frankfurt. 4.10 p.m.—Baritone Song Recital. 5.15 p.m.—Recital of Old Funeral Chants to Lute accompaniment. 5.45 p.m.—Sports Notes. 6.0 p.m.—Talk: Modern American Youth. 6.30 p.m.—Literary Programme. 7.0 p.m.—Sacred Concert from the Works of Johannes Sebastian Bach, relayed from the Evangelical Stadtkirche, Pforzheim. Funeral Music for Choir, Soloists, Orchestra and Organ. Cantata for Contralto Orchestra and Organ: Schlage doch gewünschte Stunde. Cantata for Choir and Solo Voices: O Ewigkeit, du Donnerwort. Cantata for Choir, Soloists, Orchestra and Organ: Ein' feste Burg ist unser Gott. 8.30 p.m.—See Frankfurt. 10.30 p.m.—News and Sports Notes.

TURIN (Italy)

Ente Italiano Audizioni Radiofoniche (ITO). 1,030 kc/s (291 m.); 7 kw. 8.45 a.m.—English Language Lesson. 9.15 a.m.—News Bulletin. 9.30 a.m.—Bible Readings. 9.45 a.m.—Concert of Sacred Music. 11.30 a.m.—Concert of Light Music. 2.30 p.m.—Variety Programme. 3.0 p.m.—Programme from Milan. 3.40 p.m.—Quintet Concert of Light Music and Dance Music. 5.0 p.m.—Club Notes. 6.15 p.m.—Concert of Light Music. 7.0 p.m.—Agricultural Report. 7.15 p.m.—News Bulletin. 7.30 p.m.—Time Signal.

7.32 p.m.—Programme from Milan, followed by Light Concert. In the interval at 10.30.—News Bulletin. 11.0 p.m. (approx.)—Close Down.

VIENNA (Austria)

Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayd by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.). 9.45 a.m.—"Missa festiva" for A-cappella Choir. (Ludwig Ebner). 10.30 a.m.—Festical Concert by the Viennese Men's Choral Society, relayed from the State Opera House—the Proceeds to go towards a Richard Wagner Memorial in Vienna. Address. Prelude to "The Mastersingers" (Wagner). Choral Scene from "Parsifal" (Wagner). Das Liebesmahl der Apostel (Wagner). 2.30 p.m.—Transmission of Pictures. 3.0 p.m.—Orchestral Concert. 4.50 p.m.—Travel Talk: Gibraltar. 5.35 p.m.—Recital of Songs from the Works of Anton Rückauf. 5.50 p.m.—Pianoforte Quintet, in F Minor, Op. 34 (Johannes Brahms). 6.30 p.m.—Peter Cornelius Song Recital. 6.55 p.m.—Time and Sports News. 7.0 p.m.—"Driver Henschel"—Play in Five Acts (Gerhart Hauptmann), followed by Orchestral Concert. Phototelegraphy Transmission after the Concert.

WARSAW (Poland)

Polskie Radio. 212 kc/s (1,411 m.); 8 kw. Transmits at intervals from 9.15 a.m. 6.40 p.m.—Programme Announcements and News. 6.58 p.m.—Time Signal. 7.0 p.m.—Programme from Cracow. 7.30 p.m.—Orchestral Concert. 8.10 p.m.—Reading from a Nove (Sigrid Undset). 8.25 p.m.—Concert (continued). 9.0 p.m.—Talk: At Shanghai. 9.15 p.m.—Weather Report, Police and Sports Notes. 9.25 p.m.—Talk by Mr. Piotrovsky. 9.35 p.m.—News Bulletin. 10.0 p.m.—Dance Music relayed from the Oaza Restaurant. 11.0 p.m. (approx.)—Close Down.

YOU CAN MAKE ANY SET "ALL-ELECTRIC"



Model W.I.B., S.G. 130 volts at 20 m/a. £4 : 19 : 6 Other A.C. Models from £3 : 5 : 0



Permanent Charge (with L.T. coupler) 2, 4 & 6 volts, 1 amp. 47/8 (without L.T. coupler) 2, 4 & 6 volts, 1 amp. 42/6

No matter what set you have, no matter what the voltage of your electric supply, no matter what output your set demands, there is a Regentone H.T. Mains Unit to meet your requirements. It's nice to know, too, that every Regentone H.T. Mains Unit gives a definite output for a given voltage. Regentone Chargers—for L.T.—are designed so that they can be permanently connected both to your accumulators and to a convenient electric supply point. Pull out the switch and your accumulators are "on" charge, push in the switch and your set—any set—is ready for operation. Regentone gives you for any set the ideal mains drive—simple, convenient, reliable, possessing unique advantages, guaranteed for 12 months, and obtainable on Hire Purchase Terms. Write to-day for particulars—also for our free Art Booklet—"Radio from the Mains."



for Radio from the Mains

REGENTONE RADIO SUPPLY CO. 21, Bartlett's Bldgs., Holborn Circus, London, E.C.4. Telephone CENTRAL 9661

PROGRAMMES FOR MONDAY

(November 25)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)
Radio-Barcelona (EAJ). 860 kc/s (349 m.); 8 kw.
Transmits at intervals from 11.0 a.m.
8.30 p.m.—Astronomical Talk: How to measure the Distance of the Stars.
9.0 p.m.—Chimes, Weather Report and Exchange Quotations.
9.5 p.m.—Humorous Review of the Week's Events in Verse.
9.20 p.m.—Orchestral Selections. Japanese March (Bosch Humet). Schottische, Villa Gloria (Ribalta). Waltz Jota, El Chavo (Cotó). Córdoba (Albéniz). Selection from "Werther" (Massenet). Fox-trot, Damasco (Dotras Vila).
10.0 p.m.—News and Artistic and Industrial Relay from the Ateneo.

BERLIN (Germany)
Königswusterhausen. 183 kc/s (1,635 m.); 26 kw.
Transmits at intervals from 5.55 a.m.
3.30 p.m.—See Berlin (Witzleben).
4.30 p.m.—Talk: Religious Music.
5.0 p.m.—Talk: The Character and Destiny of Great Explorers—James Cook.
5.30 p.m.—Elementary English Lesson.
5.55 p.m.—Talk: The Rational Management of a Business.
6.20 p.m.—Talk: The Use of Wood in the Building Industry.
7.0 p.m.—Two Talks on Thoughts of the Time—The Financial and Economic Effects of the Young Plan.
8.0 p.m.—Sonata in C Minor, Op. 30, No. 2 for Violin and Pianoforte (Beethoven).
8.30 p.m.—Concert of Hungarian Music, followed by News, Dancing Lesson, Dance Music and Picture Transmission from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

BERLIN (Germany)
Witzleben. 716 kc/s (418 m.); 1.5 kw.
Transmits at intervals from 5.55 a.m.
3.30 p.m.—Orchestral Concert. Einzug des Chans (Riesefeld). Karavane in der Wüste, Kirschblütenfest und Streit der Frau Tschung und Frau Tschang (Niemann). Pastoral (Dransmann). Music from "Günstling von Schönbrunn." Serenata napoletana and Kater Murr Grottesque (Bece). German Dances (Schubert). Arietta in Old Style (Broggi). Rusticanello (Cortopassi). España (Chabrier). Intermezzo from "William Ratcliff" (Mascagni). Selection from "Francesca da Rimini" (Tchaikovsky). Three Songs (Brahms). Träumerei (Schumann). Minuet (Boccherini). Siberia (Giordano).
5.30 p.m.—Topical Programme.
6.0 p.m.—Pianoforte Recital: Pictures from an Exhibition (Mousorgsky).
6.30 p.m.—Talk: How to make Museums of Living Interest.
7.0 p.m.—See Königswusterhausen.
7.25 p.m.—Talk by Dr. Quaat.
8.0 p.m.—Programme of Hungarian Music.
8.30 p.m.—Alfons Paquet reads from his own Works, followed by Time, Weather, News, and Sports Notes.
9.30 p.m.—Dancing Lesson, followed by Dance Music. Picture Transmission in the interval.
11.30 p.m. (approx.)—Close Down.

BERNE (Switzerland)
Radio-Berne. 743 kc/s (403 m.); 1 kw.
Transmits at intervals from 11.43 a.m.
5.15 p.m.—Berne's National Festival "Der Zibelenärit"—Variety Programme with Historical Reminiscences, Old and Modern Songs and Relays from Places of Interest in Berne.
8.20 p.m.—Orchestral Music from the Kursaal Schänzli.
9.0 p.m.—(In the interval)—News and Weather.
9.40 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)
1,076 kc/s (279 m.); 12.5 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—Programme from Prague.
6.5 p.m.—Programme from Brno. (See Prague).
7.15 p.m.—Talk: The History of the Castles in the Valley of Váh.
7.30 p.m.—See Prague.
9.15 p.m.—Concert from Brno, 878 kc/s (342 m.).
9.55 p.m.—Programme Announcements and News.

BRESLAU (Germany)
923 kc/s (325 m.); 2 kw. Relayed by Gleiwitz, 1,184 kc/s (253 m.).
Transmits at intervals from 8.30 a.m.
6.25 p.m.—Weather for Farmers and Gramophone Records of Paul Whiteman and his Orchestra.
6.55 p.m.—Weather Forecast.
7.0 p.m.—See Königswusterhausen.
7.50 p.m. (from Gleiwitz)—Variety Programme.
8.40 p.m.—Flute Recital. Four Little Pieces for Flute (Nick). Serenade, Op. 77A for Flute, Violin and Viola (Reger).
9.10 p.m.—News Bulletin.
9.30 p.m.—See Berlin (Witzleben).
10.0 p.m.—Answers to Correspondents.
10.15 p.m.—Dance Music from Berlin (Witzleben).
11.0 p.m. (approx.)—Close Down.

BRUSSELS (Belgium)
Radio-Belgique. 590 kc/s (508.5 m.); 1 kw.
5.0 p.m.—Trio Concert. Micheline (d'Argel). Chanson mignonne (Hazen). Lullaby (Boëllmann). Slavonic Dance (Dvorák). Pianoforte Solo. Selection from "Ariadne" (Massenet). Cello Solo. World of Love (Wood). Venetian Barcarolle (Leoncavallo). Enchante-ment (Massenet). Flower of Seville (Scassola). Violin Solo. Quand on est trois (Szulc).
6.0 p.m.—Talk: A Strange Tribe in Afghanistan.
6.15 p.m.—Esperanto Lesson.
6.30 p.m.—Gramophone Records.
7.30 p.m.—Le Journal parlé.
8.15 p.m.—Orchestral Concert. The Merry-makers (Coates). Selection from "Coups de roulis" (Messager). Songs. Selection from "Tip-Toes" (Gershwin). Songs. Waltz. Selection from "The Show Boat" (Kern). Two 'Cello Solos (Strauss). Selection from "Good News" (de Sylva and Brown). Romance for Clarinet (Delcroix). Orchestral Dance Novelities. In the interval at 9.0 p.m.—Topical Talk.
10.15 p.m.—News Bulletin.

BUDAPEST (Hungary)
545 kc/s (550 m.); 20 kw.
Transmits at intervals from 9.15 a.m.
7.30 p.m.—International Concert. Hungarian Music. Trio in B flat Major, Op. 4 (Goldmark). Sonata for Cello, Op. 8 (Kodály). Songs (Liszt). String Quartet (Bartók).
9.0 p.m. (approx.)—Time, Weather, News and Concert by the Tzigane Orchestra from the Café Ostende.

COLOGNE (Germany)
Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw.
See Langenberg Programme.

COPENHAGEN (Denmark)
1,069 kc/s (281 m.); 0.75 kw. Relayed by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
5.50 p.m.—Meteorological Report.
6.0 p.m.—News Bulletin.
6.15 p.m.—Time Signal.
6.30 p.m.—Talk: Seasonable Irrigation in the Country.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—Relay from the Grundtvig Hus of the Public Meeting of the Wireless Listeners' Organisation. Order of the Day: The Rights and Aims of the Societies of Wireless Listeners. Introductions by the following Organisations: The Abstainers' Wireless Society. The Common Council of the Danish Radio Clubs. The Copenhagen Radio Club. The Danish Radio Clubs. The Christian Listeners' Society. The Workers' Radio Club. News after the Programme.
10.15 p.m.—Dance Music from Nimb's Restaurant.
12 midnight (approx.)—Close Down.

CORK (Ireland)
(6CK). 1,337 kc/s (225 m.); 1 kw.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)
Polskie Radio. 959 kc/s (313 m.); 0.5 kw.
Transmits at intervals from 10.58 a.m.
6.58 p.m.—Time Signal.
7.0 p.m.—Church Chimes.
7.5 p.m.—Talk: Film Reminiscences.
7.30 p.m.—International Concert, relayed from Budapest.
9.0 p.m.—Programme from Warsaw.
11.0 p.m.—Chimes and Close Down.

DUBLIN (Ireland)
(2 RN) 725 kc/s (413 m.); 1 kw.
1.30 p.m.—Time, Weather, Exchange and Gramophone Records.
6.0 p.m.—Gramophone Selections.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Selections.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time; Irish Lesson.
7.45 p.m.—Talk for Farmers by Prof. Mason, M.R.C.V.S.: The Production of Clean Milk.
8.0 p.m.—Orchestral Concert by the Dublin Philharmonic Society.
10.0 p.m.—Mary O'Hea and Company: Sketch.
10.30 p.m.—Time, News, Weather Report and Close Down.

FRANKFURT-am-MAIN (Germany)
770 kc/s (390 m.); 1.5 kw. Relayed by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.30 a.m.
4.20 p.m.—Programme from Stuttgart.
5.0 p.m.—Talk (to be announced).
5.20 p.m.—English Literature.
5.35 p.m.—English Language Lesson.
6.0 p.m.—Debate: Young People's Walking Tours.
6.30 p.m.—Zither Recital by Martin Hofler.
7.0 p.m.—See Königswusterhausen.
7.50 p.m.—Concert relayed from Baden-Baden.
9.0 p.m. (from Cassel)—Paul Zech reads from his own Works.
9.30 p.m.—Dance Music from the Café Bauer.

HAMBURG (Germany)
Norag (ha, in Morse), 806 kc/s (372 m.); 1.5 kw. Relayed by Bremen, 941 kc/s (319 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.20 a.m.
5.0 p.m.—Orchestral Concert.
5.30 p.m.—See Königswusterhausen.
6.0 p.m.—Concert (continued).
6.25 p.m. (from Bremen)—Programme for Workers: From the World of the Harbour—Talk by a Navy.
6.50 p.m.—Frankfurt Exchange and Hamburg Market Prices.
6.55 p.m.—Weather Report.
7.0 p.m.—See Königswusterhausen.
7.50 p.m.—Light Concert from the Works of Mozart, by the Norag Orchestra and Soloists. Overture, "Il Seraglio." Aria from "Il Seraglio." Songs: (a) Die Spinnerin, (b) Warnung. Sextet in F major for Two Violins, Viola, Bass and Two Horns. Vocal Selection: Das Bandel. Duet from "The Magic Flute." Aria from "Don Juan." Overture, "The Marriage of Figaro."
8.50 (from Hanover)—"Voices of the Nations"—a Programme for Workers. The Slavonic Races. Introductory Talk. Choral Selection: Warschaujanka. Recitations: (a) The City in Tears (Jaroslav Seifert), (b) The Eyes (Jiri Wolker). Choral Selection: Song of the Volga Boatmen. Recitations: (a) Why is the Sea so red? (Russian Folk Melody), (b) The Russian Exiles' Train (Kreowsky), (c) Red Snow (Ja). Choral Selection: Dubinuschka Oak Cudgel—Russian Folk Song. The Chinese: Explanatory Notes. Recitations: (a) Chinese War Song (translation by Rickert), (b) The Mikado, (c) Harvest, (d) To Freedom. The Negroes: Explanatory Words. Orchestra: African Suite (Erdlen). Plantation Songs. Recitations: (a) Weary (Fenton Johnson), (b) Our Land (Langston Hughes), (c) I too (Nussbaum-Langston Hughes), (d) Children of the Sun (Johnson). The Indians. Explanatory Talk. Indian Songs. Recitation: "The Feast of the Fathers." (Heinitz). The Europeans: Explanatory Talk. Recitation: The 14th of July (Béranger). Explanatory Talk. Choral Selection. Recitations: (a) Poor Conrad, (b) All we Working People (Lersch). Choral Selection: Republican Hymn (Bröger-Lendvai).
10.15 p.m.—Talks, News, Weather, Sports and Miscellaneous Notes.
10.30 p.m.—Concert relayed from the Restaurant Ostermann.

KALUNDBORG (Denmark)
Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)
Polskie Radio: 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m.
6.58 p.m.—Time and News.
7.5 p.m.—Talk: Popular Decorative Art in Silesia.
7.30 p.m.—International Concert, relayed from Budapest.
9.0 p.m.—Reading.
9.15 p.m.—Weather, Programme Announcements in French and News.
9.35 p.m.—Press Review.
10.0 p.m.—Dance Music.

KÖNIGSBERG (Germany)
Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relayed by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
5.15 p.m.—Advice on Careers: Shall My Boy be a Paperhanger?
5.45 p.m.—Interviews before the Microphone—Problems of Contemporary Music, by Prof. Müller-Blattau and Herbert Altmann.
6.15 p.m.—Talk: Current Events.
6.30 p.m.—English Language Lesson.
7.0 p.m.—Weather Report.
7.5 p.m.—"High Mass in B Minor" (Bach), relayed from the Town Hall.
8.30 p.m.—Reading from "The Fishers of Lofoten" (Johann Bojer).
9.10 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Light Music relayed from the Central Hotel.
10.30 p.m. (approx.)—Close Down.

LAHTI (Finland)
167 kc/s (1,800 m.); 40 kw. Relayed by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
6.5 p.m.—Choral Concert.
8.0 p.m.—News in Finnish.
8.15 p.m.—News in Swedish.

LANGENBERG (Germany)
Westdeutscher Rundfunk. 675 kc/s

11.55 a.m.—Tzigane Concert.
1.40 p.m.—Talk (to be announced).
2.25 p.m.—Music from the Rembrandt Picture House, Amsterdam.
4.10—4.40 p.m.—Interval.
4.40 p.m.—Programme for Children.
5.40 p.m.—Time and Gramophone Records.
6.10 p.m.—Exchange Quotations.
6.25 p.m.—Weekly Book Talk.
6.55 p.m.—English Language Lesson.
7.25 p.m.—Police Announcements.
7.40 p.m.—Time and Concert by the Amsterdam Police Choir and Postal Band. Marche militaire (Rousseau). The Bride (den Hertog). Oriental Suite (Poppy). The Ruins (Brandts Buys). Tales from the Vienna Woods (J. Strauss).
8.40 p.m.—Orchestral Concert. Overture, "Cosi fan tutte" (Mozart). Ballet Music from "The Cid" (Massenet). Recitative and Aria from "Cosi fan tutte" (Mozart). Violin Solos: (a) Canzonetta from The Concerto for Violin (Boccherini), (b) Minuet (Boccherini). Tarantella, La Danza (Bolzoni). Songs: (a) Addio a Lugane (Rossini), (b) Una furtiva lagrima (Campana). Selection from "A Waltz Dream" (O. Strauss). Ein Souper bei Suppe (Morena). Sizi-lietta (v. Blon). March, San Sebastian (Dufort). In the interval at 9.30 p.m.—Weather and News.
10.40 p.m.—Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)
160 kc/s (1,875 m.); 6.5 kw.
7.55 a.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55 a.m.—Morning Concert.
10.10 a.m.—Programme for Hospitals.
10.40 a.m.—Reading by Miss J. Doyen.
11.10 a.m.—Vocal and Instrumental Concert.

12.10 p.m.—Organ Recital.
1.40 p.m.—Programme for Schools.
2.55 p.m.—Dressmaking Lesson.
3.40 p.m.—Programme for Hospitals.
4.40 p.m.—Soprano, Violin and Pianoforte Recital.
6.10 p.m.—Literary Talk.
6.40 p.m.—Gramophone Records.
7.10 p.m.—Talk by Mr. Los.
7.40 p.m.—Eightieth Anniversary Concert of the Utrecht Royal Male Voice Choir, relayed from the Tivoli, Utrecht. Gramophone Records in the intervals. News after the Concert.

KALUNDBORG (Denmark)
Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)
Polskie Radio: 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m.
6.58 p.m.—Time and News.
7.5 p.m.—Talk: Popular Decorative Art in Silesia.
7.30 p.m.—International Concert, relayed from Budapest.
9.0 p.m.—Reading.
9.15 p.m.—Weather, Programme Announcements in French and News.
9.35 p.m.—Press Review.
10.0 p.m.—Dance Music.

KÖNIGSBERG (Germany)
Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relayed by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
5.15 p.m.—Advice on Careers: Shall My Boy be a Paperhanger?
5.45 p.m.—Interviews before the Microphone—Problems of Contemporary Music, by Prof. Müller-Blattau and Herbert Altmann.
6.15 p.m.—Talk: Current Events.
6.30 p.m.—English Language Lesson.
7.0 p.m.—Weather Report.
7.5 p.m.—"High Mass in B Minor" (Bach), relayed from the Town Hall.
8.30 p.m.—Reading from "The Fishers of Lofoten" (Johann Bojer).
9.10 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Light Music relayed from the Central Hotel.
10.30 p.m. (approx.)—Close Down.

LAHTI (Finland)
167 kc/s (1,800 m.); 40 kw. Relayed by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
6.5 p.m.—Choral Concert.
8.0 p.m.—News in Finnish.
8.15 p.m.—News in Swedish.

LANGENBERG (Germany)
Westdeutscher Rundfunk. 675 kc/s

(473 m.); 13 kw. Relayed by Aix-la-Chapelle, 662 kc/s (453 m.); Cologie, 1,310 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.).
Transmits at intervals from 5.45 a.m.
3.5 p.m.—Talk for Women: Bringing up Children in the Twentieth Century—The U.S.A.
3.30 p.m.—Paul Zech reads from his own Works.
3.55 p.m.—Programme for Children.
4.30 p.m.—Instrumental and Vocal Concert.
5.30 p.m.—Talk: The Fate of the South American Indians.
5.50 p.m.—Talk: Current Events.
6.0 p.m.—Report on Economics, Weather and Sports Notes.
6.15 p.m.—Spanish Conversation.
6.40 p.m.—Talk for Parents: The Anticipated Joys of Christmas.
7.0 p.m.—Orchestral Concert. Polonaise in D Major (Moszkovsky). Waltz, Vibrationen (Strauss). Potpourri, Frühlingstau auf Schumanns Grab (Urbach). Dance of the Rose-Elves (Moszkovsky). Ballet Suite from "Sylvia" (Delibes). March, Venezia (Fabiani).
8.0 p.m.—"The Life, Literature and Music of the Negro Race" followed by News, Sports Notes, Business Announcements, Concert and Dance Music.
11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)
Mitteldeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relayed by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m.
3.30 p.m.—Orchestral Concert. Capriccio espagnole (Rimsky-Korsakoff). Concertino for Clarinet (Busoni). Italian Chamber Suite (Fritzsch). Serenade, Op. 15 (Beisheim). Aus dem Morgenlande (Heuberg).
4.55 p.m.—Economic Notes.
5.5 p.m.—Station Notes.
5.20 p.m.—Weather and Time.
6.0 p.m.—Literary Review: New Animal Literature.
5.55 p.m.—Labour Intelligence.
6.0 p.m.—Talk: The History of Central German Culture—St. Joachimsthal.

6.30 p.m.—Concert of Waltzes by Male Voice Choir and Orchestra.
7.30 p.m.—Carl Zuckmayer reads from his own Works.
8.0 p.m.—Symphony Concert from the Works of North German Composers.
9.0 p.m.—Time Signal, Weather, News and Sports Notes.
9.30 p.m.—See Berlin (Witzleben).
11.30 p.m. (Leipzig only)—Gramophone Records.
12.30 a.m. (Tuesday)—Close Down.

LJUBLJANA (Yugoslavia)
Radio-Ljubljana. 530 kc/s (566 m.); 2.5 kw.
Transmits at intervals from 11.30 a.m.
7.0 p.m.—Quartet Concert.
9.0 p.m.—Time, News and Programme Announcements.

MADRID (Spain)
Union Radio (EAJ7). 707 kc/s (424 m.); 2 kw.
Transmits at intervals from 11.45 a.m.
7.0 p.m.—Chimes, Exchange Quotations and Dance Music.
8.25 p.m.—News Bulletin.
8.30 p.m. (approx.)—Close Down.

MILAN (Italy)
Ente Italiano Audizioni Radiofoniche. 509 kc/s (501 m.); 7 kw.
Transmits at intervals from 7.15 a.m.
7.30 p.m.—Time Signal.
7.32 p.m.—Evening Concert.
8.0 p.m.—Variety Items.
8.15 p.m.—Moriacchi Programme.
8.50 p.m.—Variety Programme. In the intervals at 9.0 p.m.—Talk: The Theatre, and at 10.30 p.m.—Wireless News.
11.0 p.m. (approx.)—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia)
1,139 kc/s (263 m.); 10 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—See Prague.
9.15 p.m.—Band Concert from Brno, 878 kc/s (342 m.).
9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

MOTALA (Sweden)
223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

MUNICH (Germany)
563 kc/s (533 m.); 1.5 kw. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserlautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m.
6.30 p.m.—Concert by the Wireless

Programmes for Monday—(Cont.)

Trio with Recital of Austrian Folk Songs.
8.5 p.m.—Chamber Music, Scottish and Welsh Folk Songs for Soprano Violin, Cello and Pianoforte (Haydn). Pianoforte Trio in F major op. 37 (Tcherepnine). Scottish and Welsh Folk Songs for Soprano, Violin, Cello and Pianoforte (Haydn). Pianoforte Trio in E flat major (Beethoven).
9.20 p.m.—News Bulletin.
9.45 p.m.—Dancing Lesson.

OSLO (Norway)
Kringkastingselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by *Fredrikstad*, 761 kc/s (394 m.); *Hamar*, 527 kc/s (570 m.); *Notodden*, 1,058 kc/s (283 m.); *Porsgrund*, 662 kc/s (453 m.).
Transmits at intervals from 10.10 a.m.
6.15 p.m.—Weather and News.
6.30 p.m.—Elementary German Lesson.

7.0 p.m.—Time Signal.
7.2 p.m.—Cello and Tenor Song Recital.
7.45 p.m.—Talk: Timber Yards in Borregaard, relayed from *Sarpsborg*.
8.30 p.m.—Weather and News.
8.50 p.m.—Topical Talk.
9.5 p.m.—Pianoforte Recital and Recitations.

9.35 p.m. (approx.).—Close Down.
PARIS (France)
Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
Transmits at intervals from 8.0 a.m.
6.30 p.m.—Radio-Journal de France.
8.0 p.m.—Talk on Aviation.
8.15 p.m.—Talk by M. Chaponot.
8.30 p.m.—Scientific Talk.
8.45 p.m.—Concert, followed by News, Time and Weather.

PARIS (France)
Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.
7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
5.45 p.m.—Le Journal Parlé.
7.10 p.m.—Meteorological Forecast.
7.20 p.m.—Concert. Suite française (Casadesus). 'Cello Solo: Lamento (Abiatto). Ballet païen (Colomb). La légende d'un papillon (Colomb). Songs: (a) Amarillis (Caccini), (b) La forêt va dormir (Masson),

(c) Air champêtre and Air vif (Poulenc). Suite, Les beaux Dimanches (Fauchey). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
8.45 p.m.—Concert relayed from *Bordeaux-Lafayette*, 1,090 kc/s (275 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
Petit Parisien. 914 kc/s (329 m.); 0.5 kw.
8.30 p.m.—Transmission of Pictures.
9.0 p.m.—Quintet Concert. Overture, "La dame blanche" (Boieldieu). Intermezzo from "Cavalleria rusticana" (Mascagni). Sereenade from "Don Quixote" (Massenet). Selection from "Jocelyn" (Goddard). Affectuoso for Piano, Flute and Violin from the Brandenburg Concerto, No. 5 (Bach). Piano Solo: "Jardins sous la pluie, from "Estampes" (Debussy). Sonata for "Cello and Pianoforte (Mendelssohn). Selection from "Boccaccio" (Suppé). Evocation from "La Légende du point d'Argentan" (Fourdrain). Dance (Debussy). Bellone en fureur (Flament).

PARIS (France)
Radio-Paris. (CFR). 174 kc/s (1,725 m.); 12 kw.
Transmits at intervals from 6.45 a.m.
12.30 p.m.—Gramophone Concert. In the interval at 1.0 p.m.—Exchange Quotations and News.
2.0 p.m.—Exchange; Market Prices
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Concert dedicated to Chateau-Thierry. Talk: The Chateau-Thierry District. Recitations: (a) Vers à une toute jeune fille (La Fontaine), (b) A la suite de La Fontaine (Moreau), (c) Hommage à La Fontaine (Lalande), (d) L'Anneau nuptial (Haudot). Readings from "L'Estraordinaire aventure de François Badouireau" (Jary). Flute and Pianoforte Selections: (a) Intermezzo and Waltz from "Ballet sous la neige" (Papellard), (b) Pan, and (c) Monsieur de la Béjaudie (Roussel). Talk on the Painter Aman. Songs (a) Le Retour de Jean de la Fontaine (Papellard), (b) Aubade (Mathieu), (c) Selections from "La Basoche" (Messenger). Recitations:

PARIS (France)
Radio-Paris. (CFR). 174 kc/s (1,725 m.); 12 kw.
Transmits at intervals from 6.45 a.m.
12.30 p.m.—Gramophone Concert. In the interval at 1.0 p.m.—Exchange Quotations and News.
2.0 p.m.—Exchange; Market Prices
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Concert dedicated to Chateau-Thierry. Talk: The Chateau-Thierry District. Recitations: (a) Vers à une toute jeune fille (La Fontaine), (b) A la suite de La Fontaine (Moreau), (c) Hommage à La Fontaine (Lalande), (d) L'Anneau nuptial (Haudot). Readings from "L'Estraordinaire aventure de François Badouireau" (Jary). Flute and Pianoforte Selections: (a) Intermezzo and Waltz from "Ballet sous la neige" (Papellard), (b) Pan, and (c) Monsieur de la Béjaudie (Roussel). Talk on the Painter Aman. Songs (a) Le Retour de Jean de la Fontaine (Papellard), (b) Aubade (Mathieu), (c) Selections from "La Basoche" (Messenger). Recitations:

(a) Au Monastère de Val-Secret (Flament), (b) Le Cog de St. Gengoulph and (c) Suzy, joli village (Pinal), (d) Aux Américains de l'Aisne (Ott).
4.55 p.m.—News and Exchange Quotations.
6.0 p.m.—Agricultural Report and Racing Results.
6.30 p.m.—New York Exchange Rates.
6.35 p.m.—Gramophone Concert.
7.30 p.m.—Elementary Bookkeeping Lesson.
7.45 p.m.—Commercial Prices, News and Sports Notes.
8.0 p.m.—Concert. "La Veillée d'Armes"—Play (Farrère and Népaty). Trio (Haydn). Songs. Quartet (Chausson). In the intervals, at 8.30 p.m.—Closing Prices of the American Markets and Sports Notes, and at 9.15 p.m.—Press Review and Time Signal.

PITTSBURGH (U.S.A.)
Westinghouse Electric (KDKA) 980 kc/s (306 m.); 25 kw.
Transmits at intervals from 1.30 p.m.
11.30 p.m.—Fleet Wing Band.
12 midnight.—Safety Sam's Musical Moments.
12.15 a.m. (Tuesday).—Nunn Bush Symphony Concert.
12.30 a.m.—Brunswick Brevities.
1.0—4.15 a.m.—New York Relay.
4.16 a.m.—McKay Chain Temperature, followed by Slumber Music from New York.
5.0 a.m.—Champion Weather Reports and Don Bestor's Recording Orchestra.

POSEN (Poland)
896 kc/s (335 m.); 1.2 kw.
Transmits at intervals from 12 noon.
7.5 p.m.—Talk: Schools in Poland.
7.30 p.m.—International Concert relayed from *Budapest*, via *Warsaw*. Theatre and Station Notes in the intervals.
9.0 p.m.—Time Signal, Sports Notes and News Bulletin.
9.15 p.m.—Transmission of Pictures.
9.45 p.m.—Dancing Lesson.
10.10 p.m. (approx.).—Close Down.

PRAGUE (Czechoslovakia)
Strašnice. 617 kc/s (487 m.); 5 kw.
Transmits at intervals from 10.15 a.m.
6.0 p.m.—Time and News.
6.5 p.m.—Cabaret Programme from *Brno*, 878 kc/s (342 m.).
7.30 p.m.—International Programme relayed from *Budapest*.

9.0 p.m.—Time, News, Sports Notes and Gramophone Records.
9.55 p.m.—Notices, Programme Announcements and Theatre Review.

ROME (Italy)
Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw.
Transmits at intervals from 12 noon.
7.30 p.m.—News, Weather, Wireless Notes and Time Signal.
8.2 p.m.—Concert of Neapolitan Songs. In the intervals, "La Prima Avventura"—One-Act Play (Poggiolo) and Variety Items by Pinelli.
10.5 p.m.—News Bulletin.

STOCKHOLM (Sweden)
Radiotjänst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by *Boden*, 250 kc/s (1,200 m.); *Göteborg*, 932 kc/s (322 m.); *Hörby*, 1,166 kc/s (257 m.); *Motala*, 223 kc/s (1,345 m.); *Ostersund*, 389 kc/s (770 m.); *Sundsvall*, 554 kc/s (542 m.).
Transmits at intervals from 6.15 a.m.
5.30 p.m.—Concert of Light Music.
6.0 p.m.—Talk: New Legislation.
6.30 p.m.—English Language Lesson.
7.0 p.m.—Gala Programme relayed from the *Royal Opera House*. Festival Overture. Recital by Selma Lagerlöf. Overture and Third Act from "The Marriage of Figaro"—Opera (Mozart).
8.15 p.m.—News and Weather.
8.35 p.m.—Gala Programme (contd.).
Ranjana—Poem (Tagore) to Music by Björn Schildknecht. The Second Act of "La Tosca" (Puccini).
9.30 p.m. (approx.).—Close Down.

STUTTGART (Germany)
Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by *Freiburg*, 527 kc/s (570 m.).
Transmits at intervals from 9.0 a.m.
3.0 p.m.—Orchestral Concert from the Works of Contemporary Composers.
4.45 p.m.—Time, Weather and Labour Market Report.
5.0 p.m.—Talk: Ulrich von Hutten.
5.30 p.m.—Talk: Schubert's Song Cycle, "Die schöne Müllerin".
6.0 p.m.—Reading: "Barbier Zitterlein" (Friedrich Hebbel).
6.30 p.m.—Programme from *Frankfurt*.
7.0 p.m.—Concert from the Works of Baden Composers, relayed from *Baden-Baden*. Prelude to "Simson" (Franz Philipp). Rondo

(Julius Weismann). Concert Piece for Pianoforte and Orchestra (Robert Kahn)—the Composer at the Pianoforte. Symphony No. 2 (Arthur Kusterer).

9.0 p.m.—See *Frankfurt Programme*.
9.30 p.m.—News Bulletin.
9.45 p.m.—Programme from *Frankfurt*.

TURIN (Italy)
Ente Italiano Audizioni Radiofoniche (I TO). 1,030 kc/s (291 m.); 7 kw.
Transmits at intervals from 7.15 a.m.
7.30 p.m.—Time Signal.
7.32 p.m.—Programme from *Milan*.
10.0 p.m.—Concert. In the interval at 10.30 p.m.—Wireless News.
11.0 p.m. (approx.).—Close Down.

VIENNA (Austria)
Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayed by *Graz*, 851 kc/s (352.5 m.); *Innsbruck*, 1,058 kc/s (283.5 m.); *Klagenfurt*, 662 kc/s (453.2 m.); and *Linz*, 1,220 kc/s (245.9 m.).
Transmits at intervals from 10.0 a.m.
5.30 p.m.—Talk: Human Feelings—a Psychological Study.
6.0 p.m.—Talk: Modern Interior Decoration.
6.30 p.m.—Talk: Crows in Winter.
7.0 p.m.—Time and Weather.
7.5 p.m.—Recital of Songs. Freschi Luoghi, prati autenti, and O del mio amato ben (St. Donaudy). Where the Bee sucks (Arne). The Little Island (Rachmaninoff). Selection (Dvorák). Evening Prayer and Hopak (Moussorgsky).

7.30 p.m.—International Programme relayed from *Budapest*, followed by Concert of Light Music and Phototelegraphy Transmission.
WARSAW (Poland)
Polskie Radio. 212 kc/s (1,411 m.); 8 kw.
Transmits at intervals from 10.58 a.m.
6.10 p.m.—Agricultural Report.
6.25 p.m.—Gramophone Records.
6.58 p.m.—Time Signal.
7.0 p.m.—Programme Announcements and News Bulletin.
7.15 p.m.—Talk on Music.
7.30 p.m.—International Concert, relayed from *Budapest*.
9.0 p.m.—Talk on Books.
9.15 p.m.—Weather, Police and Sports Notes.
9.25 p.m.—Talk and News.
10.0 p.m.—Dance Music, relayed from the *Oaza Restaurant*.
11.0 p.m. (approx.).—Close Down.

C.A.V. The latest & best in H.T. Accumulators

This entirely new range of C.A.V. H.T. Accumulators nas many unique features to commend them to all radio users. They are supplied in separate 10-volt blocks and assembled 30-volt units, the latter comprising three 10-volt blocks air spaced from each other and assembled in a carrying tray. All-moulded acid proof material so popularly used for car batteries, is employed for the cell containers and trays, the polished surface giving an attractive appearance.

M 103	5000
10 VOLT UNIT	6/3 MILL. AMP. HRS.

Also supplied in 2,500 & 10,000 Milliamp Hrs.

Specify the C. A. V. Jelly Acid Battery—The Perfect L.T. for all Portables.

WRITE FOR CATALOGUE W.

C.A.V. Vandervell & Co., Ltd.
ACTON, LONDON, W 3

PROGRAMMES FOR TUESDAY

(November 26)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)

Radio-Barcelona (EAJ 1). 860 kc/s (349 m.); 8 kw.
Transmits at intervals from 11.0 a.m.
8.30 p.m.—Elementary English Lesson.
9.0 p.m.—Chimes, Weather, Exchange Quotations and News.
9.5 p.m.—Concert of Sardanias by the Clobla Barcelona.
10.0 p.m.—News Bulletin.
10.5 p.m.—Guitar Recital.
10.30 p.m.—Orchestral Selection: Suite marocaine (Messier), followed by Barcelona Exhibition Notes.
11.0 p.m. (approx.)—Close Down.

BELGRADE (Yugoslavia)

699 kc/s (429 m.); 2.5 kw.
Transmits at intervals from 9.30 a.m.
4.0 p.m.—Agricultural Talk.
4.5 p.m.—Reading of a Short Story, "Rudica" (Simunovic).
4.25 p.m.—Gramophone Concert.
5.0 p.m.—Concert from the Moskva Café.
6.30 p.m.—German Language Lesson.
7.0 p.m.—Talk by Dr. Leo Vokac.
7.30 p.m.—Concert from the Works of Rubinstein. Sonata No. 49 for Viola and Pianoforte. Songs: (a) Wein nicht, mein Kind, (b) Am Himmelsokan, Aria from "Der Dämon." Sonata No. 19 for Cello and Pianoforte. Songs: (a) Ich bin der, auf den Du denkst, (b) Der Schwur, Aria from "Der Dämon."
9.0 p.m.—Time and News.
9.10 p.m.—Quartet Concert.

BERGEN (Norway)

Kringkastingskapet. 824 kc/s (364 m.); 1 kw.
Transmits at intervals from 11.0 a.m.
6.20 p.m.—Agricultural Talk.
6.50 p.m.—Talk in English by Mr. F. M. Somerville.
7.20 p.m.—Talk by Mr. Gunnar Greve.
8.25 p.m.—New Literature.
8.45 p.m.—Topical Talk.
9.0 p.m.—Weather, News and Time.
9.20 p.m.—Relay of Foreign Stations.
11.0 p.m. (approx.)—Close Down.

BERLIN (Germany)

Königsruherhaus. 183 kc/s (1,635 m.); 26 kw.
Transmits at intervals from 5.55 a.m.
3.30 p.m.—Programme from Leipzig.
4.30 p.m.—Alfons Paquet reads his own tale—"Der Knecht."
5.0 p.m.—Talk: The Understanding of Music—The Smaller Forms of Pianoforte Music.
5.30 p.m.—Advanced French Lesson.
5.55 p.m.—Talk: A Woman travels alone through Asiatic Russia.
6.20 p.m.—Talk: Political Wisdom.
7.0 p.m.—Topical Programme.
7.30 p.m.—Programme from Stuttgart, followed by Concert from the Hotel Kaiserhof. After the Concert: Programme from Berlin (Witzleben).
8.25 p.m.—New Literature.
8.45 p.m.—Topical Talk.
9.0 p.m.—Weather, News and Time.
9.20 p.m.—Relay of Foreign Stations.
11.0 p.m. (approx.)—Close Down.

BERLIN (Germany)

Witzleben. 716 kc/s (413 m.); 1.5 kw.
Transmits at intervals from 5.55 a.m.
5.30 p.m.—Baritone Song Recital from the Works of Wolf and Loewe.
4.0 p.m.—Elsa Rützel reads his own Works.
4.20 p.m.—Review of Books—New Literature on Art.
5.45 p.m.—Concert. Overture, "La villanella rapita" (Mozart). Song of the Peasant (Grieg). German Dances Nos. 3 and 4 (Beethoven). Feodora, Waltz on Motives from "The Circus Princess" (Kálmán). Siegmund's Love Song from "Die Walküre" (Wagner). Hungarian Song, Liliomszál (Dienzi). La Follietta (Marchesi). Waltz, Die guten alten Zeiten (Jos. Strauss). Der letzte Gruss (Levi). Mazurka (Scriabine). Song and Waltz, Schöne Frau im Mond (Wiga).
6.0 p.m.—Talk: The Physical Aspect of the World at the Present Day—Space and Time.
6.30 p.m.—Topical Programme—The Interview of the Week.
7.0 p.m.—Orchestral Concert. Dance of the Wooden Doll (Freud). Hallo Moskau (Grothe-Kirchstein). Gipsy Melodies (Borganoff). Tweet Tweet (Sarony). Interlude by Wilhelm Bendow. Hast du schon einmal von mir geträumt. (Grothe) Denkst du daran (Allan). Olympia (Grothe). Schau nie zu tief in schöne Augen (Raymond-Kirchstein). Butterfly (Katscher). Es

liegt soviel im kleinen Wörtchen Liebe (Grothe-Kirchstein). Es gab nur eine (Grothe). Waltz Potpourri (Robrecht). Madrid (Alex); followed by Press Review, Time, Weather, News, Sports Notes and Picture Transmission.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1 kw.
Transmits at intervals from 11.43 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: The Training of Dogs.
7.0 p.m.—"La Bohème"—Opera in Four Acts (Puccini) on Gramophone Records. In the Third Interval at 8.45 p.m. (approx.)—News and Weather.
9.30 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 12.5 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—Programme from Prague.
6.5 p.m.—Vocal and Instrumental Concert.
7.0 p.m.—Programme from Prague.
9.15 p.m.—Concert from the Café Baross.
9.55 p.m.—Programme Announcements and News.
9.23 kc/s (325 m.); 2 kw. Relayed by Gleiwitz, 1,184 kc/s (253 m.).
Transmits at intervals from 10.15 a.m.
6.45 p.m.—Weather for Farmers (from Gleiwitz).
6.75 p.m.—Programme of Readings.
6.45 p.m.—Dialogue: Beauty and Comfort in the Working Man's Home.
7.30 p.m.—Weather Forecast.
7.32 p.m.—Talk: Little known Jazz Music, with Gramophone Illustrations.
8.25 p.m.—The Poet as the Mouthpiece of his Times—Jakob Schaffner reads from his own Works.
9.0 p.m.—Press Review from Berlin (Witzleben).
9.25 p.m.—News Bulletin.
9.45 p.m.—Report of the Silesian Wireless Society.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1 kw.
5.0 p.m.—Dance Music from the Saint Sauveur Palais de Danse.
6.0 p.m.—Elementary French Lesson arranged by the Berlitz School.
6.30 p.m.—Gramophone Records.
7.30 p.m.—Le Journal parlé.
8.15 p.m.—Talk: Impressions of Dalmatia.
8.25 p.m.—Topical Talk.
8.30 p.m.—Debussy Concert arranged by "La Meuse," relayed from the Conservatoire Royal at Liège. Three Symphonic Sketches, La mer. Selections from "Pelléas et Mélisande," at 8.15 p.m. (on 338.2 m.).
—Flemish Programme—Concert arranged by the S.A.R.O.V. News after the Concert.

BUDAPEST (Hungary)

545 kc/s (550 m.); 20 kw.
Transmits at intervals from 8.15 a.m.
6.30 p.m.—Answers to Correspondents.
7.10 p.m.—Transmission of a Play.
8.25 p.m.—Choral Concert.
9.20 p.m. (approx.)—Time, Weather, News and Gramophone Concert.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 0.75 kw. Relayed by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
5.50 p.m.—Meteorological Report.
6.0 p.m.—News Bulletin.
6.15 p.m.—Time Signal.
6.30 p.m.—Talk: Character Training.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—"The Power of Darkness"—Drama in Five Acts (Leo Tolstoy), followed by News Bulletin.
9.15 p.m.—Concert of Modern Operetta Music. Hungarian March from "Zigeunerblut" (Léhár). Waltz from "Zigeunerprimas" (Kálmán). Selection from "Der liebe Augustin" (Fall). Waltz from "Die ideale Gattin" (Léhár). Selection from "The Dollar Princess" (Fall). Selection from "The Circus Princess" (Kálmán). March from "The Chocolate Soldier" (O. Straus).
10.0 p.m.—Dance Music Programme.
12 midnight (approx.)—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1 kw.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 959 kc/s (313 m.); 0.5 kw.
Transmits at intervals from 10.58 a.m.
6.10 p.m.—Agricultural Report.
6.20 p.m.—Opera Relay from Katowice, 734 kc/s (408.7 m.). After the Opera, News from Warsaw and Relay of Foreign Stations.
11.0 p.m.—Church Chimes.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1 kw.
1.30 p.m.—Time, Weather, Exchange and Gramophone Records.
6.0 p.m.—Gramophone Selections.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Selections.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time Signal.
7.32 p.m.—Leighacht Gaedhilige.
7.45 p.m.—Concert. Val Vouden (Entertainer). The Station Orchestra. Comedy Overture. Robert Irwin (Baritone). Celeste Orchestral Selections: Minuet, Sixty Years Ago. Intermezzo, Sunset. Mollie Phillips (Soprano). Signor Grossi and D. Copeman: Violin and Pianoforte Sonata. H. R. White: Musical Talk. The Rathmines Robins: Revue. Prof. R. O'Dwyer in a Varied Selection from his Compositions.
10.30 p.m.—Time, News, Weather Report and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.5 kw. Relayed by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.30 a.m.
3.0 p.m.—Orchestral Concert, followed by Old Dance Music.
5.0 p.m.—Review of Books.
5.20 p.m.—Talk on Health.
5.40 p.m.—Talk arranged by the Austro-German Workers' Society: Austria Four Hundred Years Ago.
6.0 p.m.—Programme from Leipzig.
6.30 p.m.—Local Literature—a Frankfurt Dialect Programme.
7.30 p.m.—Programme from Stuttgart.
8.30 p.m.—Orchestral Concert. Overture, "La fête du village voisin" (Boieldieu). Faust Waltz (Gounod). Suite, Scènes pittoresques (Massenet). Overture, "Mireille" (Gounod). Ballet Music from "Carmen" (Bizet).
9.30 p.m.—Dance Music.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relayed by Bremen, 941 kc/s (319 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.20 a.m.
3.15 p.m.—Cello Recital by Hans Bottermund, Solo "Cellist of the Berlin Philharmonic Orchestra, relayed from Hanover.
4.0 p.m.—Talk: Different Art Forms in Literature—Forms of Expression in the Drama.
4.25 p.m.—Talk and Reading from the Works of Karl Biegemann, a Dialect Poet, on the occasion of the 75th Anniversary of his Birth.
4.50 p.m.—Talk: Humour and Superstition among Mountain Dwellers.
5.15 p.m.—Orchestral Concert.
6.0 p.m.—Agricultural Talk: Winter Fodder.
6.25 p.m.—(from Kiel). Talk: The Oldest Memorials of the Low-German Language.
6.50 p.m.—Frankfurt Exchange: Weather.
7.0 p.m.—"Nah Hus"—Play in Five Acts in the Low-German Dialect (Eduard Schoneweg).
9.10 p.m.—Talks, News, Weather Sports and Miscellaneous Announcements.
9.30 p.m.—Relay of Foreign Stations

HILVERSUM (Holland)

1,004 kc/s (298 m.). After 5.40 p.m. 280 kc/s (1,071 m.); 6.5 kw.
9.40 a.m. till Close Down.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
9.40 a.m.—Time and Daily Service.
11.40 a.m.—Police Announcements.
11.55 a.m.—Radio Quartet Concert.
1.40 p.m.—Gramophone Records.
2.40 p.m.—Talk (to be announced).
3.40 p.m.—Afternoon Concert.
4.40—5.10 p.m.—Interval.

5.10 p.m.—Tzigane Concert.
5.40 p.m.—Time (in the interval).
6.10 p.m.—Exchange Quotations.
6.25 p.m.—English Language Lessons.
7.25 p.m.—Police Announcements.
7.40 p.m.—Time and Talk.
7.45 p.m.—Orchestral Concert. Overture, "Le roi d'Yvetot" (Adam). Selection from "La Mascotte" (Audran). Berceuse from "Jocelyn" (Godard). Waltz, Peppina (Mambour). Immer oder Nimmer (Waldteufel). Selection from "Lulu" (Pares and van Parys). Overture: "Nakiri's Wedding" (Lincke). Intermezzo, Gnomen (Gorf). Waltz, Hereinspäziert (Ziehrer). Selection from "Die geschiedene Frau" (Fall). Serenade (Kark). Lincke-Wincke (Lincke). Primavera (Grit). Florentine March (Fucik), followed by Gramophone Records. In the intervals at 8.40 p.m. and 9.40 p.m.—Talk and Weather Forecast and News.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 6.5 kw.
11.10 a.m. till Close Down.—Programme of the Catholic Radio Society (K.R.O.).
11.10 a.m.—Religious Programme.
11.55 a.m.—Trio Concert.
12.55 p.m.—Gramophone Records.
1.40 p.m.—Programme for Women.
2.40 p.m.—Dress-making Lesson.
3.10 p.m.—Programme for Schools.
3.40 p.m.—Gramophone Selections.
4.40 p.m.—Trio Concert.
5.40 p.m.—Exchange Quotations.
5.45 p.m.—Gramophone Records.
5.55 p.m.—Talk on Sport.
6.40 p.m.—Latin Lesson.
7.10 p.m.—Talk by the Rev. F. C. v. Beukering.
7.41 p.m.—Talk by Mr. Pater.
7.45 p.m.—Orchestral Concert. Soloist: Carel van Leeuwen-Boompk (Cello), followed by Gramophone Selections.
11.10 p.m. (approx.)—Close Down.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m.
6.5 p.m.—Musical Selections.
6.15 p.m.—Weekly Report for Boy Scouts.
6.20 p.m.—"Eugene Onegin"—Opera (Tchaikovsky), relayed from the Polish Theatre, Katowice. After the Programme, Weather, Press Review, Programme Announcements in French and News.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relayed by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
5.15 p.m.—Old and New Songs to the Lute.
5.45 p.m.—Talk: New Decision of the German Labour Tribunal.
6.15 p.m.—Talk: Current Events.
6.30 p.m.—(From Danzig). Elementary French Lesson.
6.55 p.m.—Weather Report.
7.0 p.m. See Berlin (Witzleben).
7.50 p.m.—Orchestral Concert. Overture, Beherscher der Geister (Weber). Rocco Variations for Cello and Orchestra (Tchaikovsky). Short Story Reading: "The Peasant and the Stranger" (Tolstoy). Russian Folk Melodies (Liadoff). Symphonic Poem, The Mid-day Witch (Dvorák).
9.10 p.m. (approx.)—Weather, News, Sports Notes.
9.30 p.m.—Light Music from the Alhambra Theatre.
11.0 p.m. (approx.)—Close Down.

LAHTI (Finland)

167 kc/s (1,800 m.); 40 kw. Relayed by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
4.0 p.m.—Choral Concert.
4.30 p.m.—Flute Recital.
4.50 p.m.—News, Time and Weather.
5.15 p.m.—Recital of Songs.
5.35 p.m.—Agricultural Talk.
6.0 p.m.—Vocal and Orchestral Concert.
7.0 p.m.—A Play.
7.30 p.m.—Gramophone Records.
7.45 p.m.—News in Finnish.
8.0 p.m.—News in Swedish.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 13 kw. Relayed by

Aix-la-Chapelle. 662 kc/s (453 m.); Cologne, 1,319 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.).
Transmits at intervals from 5.45 a.m.
4.30 p.m.—Orchestral Concert from the Works of Contemporary Composers. Overture, "The Ace of Hearts" (Künneke). Concerto in G Minor for Cello, rendered by the Composer, Otto Urack. Music to Shakespeare's "As You Like It" (Wetzel).
5.30 p.m.—Talk: Experiences in China.
5.55 p.m.—Talk: Current Events.
6.0 p.m.—Report on Economics, Weather and Sports Notes.
6.15 p.m.—French Conversation.
6.40 p.m.—Discussion on Mankind by Hardt, Honigsheim, Stein and Worn.
7.0 p.m.—Plaut-Reimann Programme. Northern Humour by Joseph Plaut; Saxon Miniatures by Hans Reimann, with Orchestral Interludes. After the Programme, News, Sports Notes, Commercial Announcements and Silent Night.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relayed by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 0.0 a.m.
3.30 p.m.—Chamber Music for Wind Instruments, by Dresden Composers. Quintet for Flute, Oboe, Clarinet, Horn and Bassoon, Op. 7 (Beythien). Suite in the Modern Style, Op. 89 in D Major (Kronke).
4.30 p.m.—Talk: Gipsies.
4.55 p.m.—Economic Notes, Weather and Time.
5.5 p.m.—Talk: The World of Women.
5.30 p.m.—See Königsruherhaus.
5.55 p.m.—Labour Intelligence.
6.0 p.m.—Talk: Work as an Economic Element.
6.30 p.m.—Talk: The Unknown Element in the Younger Generation.
7.0 p.m.—Gramophone Records of Chaliapine and Benjmino Gigli.
8.0 p.m.—Concert of Music by Paul Graener. At the Piano, the Composer.
9.20 p.m.—Time Signal, Weather, News and Sports Notes.
9.30 p.m.—"Im Vielfachmischalter Nr. 1001-1150"—Play (Hoboken), followed by Gramophone Dance Music.
11.0 p.m. (approx.)—Close Down.

LJUBLJANA (Yugoslavia)

Radijsko-Ljubljana. 530 kc/s (566 m.); 2.5 kw.
Transmits at intervals from 11.30 a.m.
6.0 p.m.—Talk: The Marionette Theatre.
6.30 p.m.—Russian Language Lesson.
7.0 p.m.—Pianoforte Recital.
9.0 p.m.—Time, News and Concert of Light Music.
10.0 p.m.—Programme Announcements.

MADRID (Spain)

Union Radio (EAJ 7). 707 kc/s (424 m.); 2 kw.
Transmits at intervals from 11.45 a.m.
7.0 p.m.—Chimes, Exchange Quotations, and Programme for Children.
8.0 p.m.—Dance Music Programme.
8.25 p.m.—News Bulletin.
8.30—10.0 p.m.—No Transmission.
10.0 p.m.—Chimes, Time, Exchange Quotations and Relay of an Opera (not yet announced) from the Gran Teatro del Liceo, Barcelona.
12.0 midnight.—Chimes, News and Dance Music relayed from the Palacio de Bellas Artes.
12.30 a.m. (Wednesday).—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radio foniche. 599 kc/s (501 m.) 7 kw.
Transmits at intervals from 7.15 a.m.
7.15 p.m.—Wireless News and Literary Review.
7.30 p.m.—Time Signal.
7.32 p.m.—Programme from Turin.
10.30 p.m.—Wireless News.
10.40 p.m.—Programme from Turin.
11.0 p.m. (approx.)—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia)

1,139 kc/s (263 m.); 10 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—Programme from Prague.
6.5 p.m.—Programme from Bratislava.
7.0 p.m.—Programme from Prague.
9.15 p.m.—Programme from Bratislava.
9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

Programmes for Tuesday—(Cont.)

MOTALA (Sweden)
223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

MUNICH (Germany)
563 kc/s (533 m.); 1.5 kw. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nuremberg, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m. 5.15 p.m.—French Language Lesson.
5.45 p.m.—Talk: European Statesmen—Ramsay MacDonald.
6.0 p.m.—Wireless Report.
6.30 p.m.—"Faust"—Opera Selection (Gounod).
8.15 p.m.—Discussion: The Continent of Asia.
8.45 p.m.—Humorous Variety Programme on Gramophone Records.
9.20 p.m.—News Bulletin.

OSLO (Norway)
Kringkastingselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by Fredrikstad, 761 kc/s (394 m.); Hamar, 527 kc/s (570 m.); Norderdalen, 1,058 kc/s (283 m.); Porsgrund, 662 kc/s (453 m.).
Transmits at intervals from 10.10 a.m. 7.30 p.m.—Orchestral Concert.
8.30 p.m.—Weather and News.
8.50 p.m.—Topical Talk.
9.5 p.m.—Concert by the Miro's Orchestra.
10.0 p.m. (approx.).—Close Down.

PARIS (France)
Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
Transmits at intervals from 8.0 a.m. 6.30 p.m.—Radio-Journal de France.
8.0 p.m.—English Lesson, arranged by the Berlitz School.
8.30 p.m.—Talk on Aviation.
8.45 p.m.—Concert arranged by the Association Générale des auditeurs de T.S.F., followed by News, Time and Weather.
10.0 p.m.—Talk: The Week Abroad.

PARIS (France)
Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.
7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
5.45 p.m.—Le Journal Parlé.

7.10 p.m.—Meteorological Forecast.
7.20 p.m.—Concert. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
Petit Parisien. 914 kc/s (329 m.) 0.5 kw.
8.30 p.m.—Transmission of Pictures.
8.45 p.m.—Gramophone Records, Talk and News Bulletin.
9.0 p.m.—Concert. Overture, "Robert Bruce" (Rossini). Waltz, No. 3 (Dvorák). Allegretto from the Seventh Symphony (Beethoven). Quintet (Beethoven). Selection from "Hérodiade" (Massenet). Meditation (Glazounoff). Norwegian Dance, No. 3 (Grieg).

PARIS (France)
Radio-Paris. (CFR). 174 kc/s (1,725 m.); 12 kw.
Transmits at intervals from 6.45 a.m. 12.30 p.m.—Gramophone Concert. In the interval at 1.0 p.m.—Exchange Quotations and News.
2.0 p.m.—Exchange; Market Prices.
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Concert. Orchestral Selection: Les Cigarettes (Filippucci). Violin Solo: Spanish Song (Chaminade). Orchestral Selection: Ritournelle (Schmitt-Chapelier). Pianoforte Solos: (a) Pavane (Gaubert), (b) Arabesques (Falkenberg), (c) Brujérias (Laparra). Orchestral Selection: Serenata madrileña (De Mesquita). Cello Solos: (a) Elégie (Fauré), (b) Allegro appassionato (Saint-Saëns). Orchestral Selection: Nuits Algériennes (Grieg-Chapelier).
4.55 p.m.—News and Exchange.
6.0 p.m.—Agricultural Report and Racing Results.
6.30 p.m.—New York Exchange Rates.
6.35 p.m.—Gramophone Concert.
7.10 p.m.—Literary Review: "The Machine" (Rabindranath Tagore).
7.30 p.m.—Elementary English Lesson.
7.45 p.m.—Commercial Prices, Economic and Social Notes and Amusement Guide.
8.0 p.m.—Concert. "L'Heure Espagnole"—Lyric Play (Ravel).

"La Légende du Point d'Argentan"—Opera (Fourdrain). In the intervals, at 8.30 p.m.—American Closing Prices, Sports Notes and News, and at 9.15 p.m.—Press Review and Time Signal.

PITTSBURG (U.S.A.)
Westinghouse Electric (KDKA). 980 kc/s (306 m.); 25 kw.
Transmits at intervals from 1.30 p.m. 12 midnight.—Chimes and Maytag Radioette.
12.30 a.m. (Wednesday).—Sacred Song Concert.
1.0—4.0 a.m.—New York Relay.
4.1 a.m.—McKay Chain Temperature.
4.2 a.m.—Don Bestor's Recording Orchestra.
4.25 a.m.—Weather, and Slumber Music from New York.

POSEN (Poland)
896 kc/s (335 m.); 1.2 kw.
Transmits at intervals from 6.15 a.m. 6.50 p.m.—An Opera, relayed from Katowice, 734 kc/s (408.7 m.). Theatre and Station Notes in the Interval.
9.30 p.m.—Time, Sports Notes and News Bulletin.
9.45 p.m.—Transmission of Pictures.
10.15 p.m.—Dance Music, relayed from the Café Esplanade.
11.0 p.m. (approx.).—Close down.

PRAGUE (Czechoslovakia)
Strasnice. 617 kc/s (487 m.) 5 kw.
Transmits at intervals from 10.15 a.m. 6.0 p.m.—Time and News.
6.5 p.m.—Band Concert.
6.45 p.m.—Talk: Rubinstein and his Influence on the World's Music.
7.0 p.m.—Concert of Chamber Music from the Works of Foerster.
9.0 p.m.—Time, News and Sports Notes.
9.15 p.m.—Concert from a Café.
9.55 p.m.—Notices, Theatre Review and Programme Announcements.

ROME (Italy)
Ente Italiano Audizioni (Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw.
Transmits at intervals from 12 noon. 7.30 p.m.—News, Weather, Talk: The Economic Importance of Local Industry; Wireless News and Time Signal.

8.2 p.m.—Relay of an Opera from a Theatre or Concert from the Studio. In the intervals, Monologues, Review of Reviews and Notes.

STAMBOUL (Turkey)
Radio Stamboul. Société Anonyme turque de téléphonie sans fil. 250 kc/s (1,200 m.); 5 kw.
3.30 p.m.—Concert of Turkish Music, Exchange Quotations and Market Prices.
4.30 p.m.—Concert. Selection from "The Daughter of the Regiment" (Donizetti). Cello Solo: Valse lente (Clerc). Intermezzo (Puccini). Selection from "Paganini" (Lehar).
6.30 p.m.—Concert of Turkish Music, followed by News.
8.30 p.m. (approx.).—Close Down.

STOCKHOLM (Sweden)
Radiojinst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
Transmits at intervals from 6.15 a.m. 5.30 p.m.—Concert of Light Music.
6.10 p.m.—Agricultural Talk.
6.30 p.m.—Talk: Light and Plant Life, from Malmö, 1,301 kc/s (231 m.).
7.0 p.m.—Concert of Swedish Music. Overture, "Orleanska jungfrun" (Södermann). Concerto for Piano and Orchestra op. 30 in D minor (Mankell). Baritone Solos from "Kung Eriks visor" (Hacquinius). Festspl (Alfven).
8.40 p.m.—Literary Review.
9.10 p.m.—Military Band Concert.
9.40 p.m. (approx.).—Close Down.

STUTT GART (Germany)
Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by Freiberg, 527 kc/s (570 m.).
Transmits at intervals from 9.0 a.m. 3.0 p.m.—Programme from Frankfurt.
4.45 p.m.—Time, Weather and Agricultural Report.
5.0 p.m.—(from Karlsruhe). Talk: The German Vocational Schools Method.
5.30 p.m.—Talk on the occasion of the Centenary of Rubinstein's birth on November 28: Rubinstein as a Man and as an Artist.

6.0 p.m.—Talk: The Burgenland.
6.30 p.m.—Humorous Swabian Programme.
7.30 p.m.—"Gringoire"—Opera in One Act (Brüll).
8.30 p.m.—Programme from Frankfurt.
9.30 p.m.—News Bulletin.
9.45 p.m.—Programme from Frankfurt.

TURIN (Italy)
Ente Italiano Audizioni Radiofoniche (I TO). 1,930 kc/s (291 m.); 7 kw.
Transmits at intervals from 7.15 a.m. 7.30 p.m.—Time Signal.
7.32 p.m.—Concert. Préludio elegiaco for Small Orchestra (Bruschettini). Selection (Bloch). Romance and Deutscher Tanz for Violin and Piano (Reger). Berceuse (Chopin). The First Symphony for Orchestra (Beethoven). Suite for String Orchestra (Corelli). Selections from "Mother Goose" (Ravel). Overture, Don Juan (Mozart). In the intervals, Talks.
10.0 p.m.—Dance Music Programme. In the interval at 10.30 p.m. Wireless News.
11.0 p.m. (approx.).—Close Down.

VIENNA (Austria)
Radio-Wien 581 kc/s (516.3m.); 15 kw. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
Transmits at intervals from 10.0 a.m. 7.0 p.m.—Time and Weather.
7.5 p.m.—Mandoline Orchestra Concert.
8.10 p.m.—"The Humorous Trio"—a Variety Programme of Songs; Arias and Duets from Operettas and Musical Comedies, with Reminiscences from the Humorous Literature of the Stage by Prof. Fritz Lanze, followed by Phototelegraphy Transmission.

WARSAW (Poland)
Polskie Radio. 212 kc/s (1,411 m.); 8 kw.
Transmits at intervals from 10.58 a.m. 6.10 p.m.—Agricultural Report.
6.20 p.m.—Opera Relay from Katowice, 734 kc/s (408.7 m.). Theatre Notes during the interval. After the Programme, Weather, Police and Sports Notes, Talk and News.

Free to callers
by post 6d. money refunded on first order.
Shows all the latest Receivers, Components, Loud-speakers, etc.

Write to:
WILL DAY LTD.
(THE BEST IN THE WEST)
19 LISLE STREET, LEICESTER SQUARE, LONDON, W.C.2.
Telephone: (2 lines) Regent 0021 and 0022. Telegrams: Tilles, Westrand, London.

The Quickest Routes to
SOUTH GERMANY
are from
VICTORIA STATION
(Short Sea Crossings)

[Through carriages,
Sleeping and
Restaurant cars]

For booklets, time-tables, etc., call or write Continental Enquiry Office, Victoria Station, London, S.W.1

SOUTHERN RAILWAY
The Key to the Continent.

PROGRAMMES FOR WEDNESDAY (November 27)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)
Radio-Barcelona (EAJT). 1860 kc/s (349 m.); 8 kw.
Transmits at intervals from 11.0 a.m.
8.30 p.m.—Elementary French Lesson.
9.0 p.m.—Chimes, Weather, News and Exchange Quotations.
9.5 p.m.—Orchestral Selection: March, The Beekeeper (Aphorip); followed by Xylophone Recital.
9.45 p.m.—Recitations (Gabriel y Galán), preceded by Talk on the Poet.
10.0 p.m.—News Bulletin.
10.5 p.m.—Concert by the Philharmonic Mandoline Orchestra, followed by Exhibition Notes.
11.0 p.m. (approx.)—Close Down.

BERLIN (Germany)
Königsruherhauschen. 183 kc/s (1,635 m.); 20 kw.
Transmits at intervals from 5.55 a.m.
3.30 p.m.—Programme from Hamburg.
4.30 p.m.—Talk: From Barbusse to Remarque—A Sociological Survey of the War Literature of Germany and other Countries.
5.0 p.m.—Talk: Modern Buildings in the Country.
5.55 p.m.—Talk: A Woman travels alone through Asiatic Russia.
6.20 p.m.—Talk: Germany and the Slavs, by Dr. Alfons Paquet.
7.0 p.m.—The Attack on Professor Weltmann—Play in One Act (Felix Mendelssohn).
8.0 p.m.—Recital for two Pianos. Slow Fox-trot, Sunshine (Berlin). Boston, Ein Hauch Jasmin (Jefte-Green). Fox-trot, Sonny Boy (Al Johnson). Fox-trot, I'm riding to Glory (Dixon-Woods). Fox-trot, Anna hat Geld, Anna hat Glück (de Sylva, Brown and Henderson). Fox-trot, Ich hab' eine Tante (Milton and Ager).
8.30 p.m.—Songs of the Hebrides sung to the Celtic Harp. The dowryless Maiden. Herding Prayer. Soothing Croon from Eigg. Land of Heart's Desire. Islay Reaper's Song. The Rocks of Rodel, followed by News, Dance Music and Picture Transmission from Berlin (Witzleben).

BERLIN (Germany)
Witzleben. 716 kc/s (418 m.); 1.5 kw.
Transmits at intervals from 5.55 a.m.
5.15 p.m.—Talk: The Rat Campaign and its importance for the General Welfare of the Nation.
5.35 p.m.—Talk: The Success of the New Workers' Law.
6.0 p.m.—Programme of Light Music.
7.30 p.m.—Arnold Schönberg Concert, conducted by the Composer. Six Songs for Voice and Orchestra; Op. 8: (a) Natur, (b) Nie ward Herrin, müd'ig, (c) Voll' jener Süsse, (d) Wenn Vögeln klagen, (e) Sehnsucht, from Des Knaben Wunderhorn, (f) Das Wappenschild, from Des Knaben Wunderhorn. Love Scene and Song of the Wood-Pigeon, from "Gurre-Lieder." In the Interval: Talk on Arnold Schönberg. After the Programme: Time, Weather, News, Sports Notes and Dance Music. Picture Transmission in the interval.
11.30 p.m. (approx.)—Close Down.

BERNE (Switzerland)
Radio-Bern. 743 kc/s (403 m.); 1 kw.
Transmits at intervals from 9.45 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: Bequests and Statistics.
7.0 p.m.—Cello Recital.
7.30 p.m.—"St Ursen Messe," relayed from the St. Urs Cathedral, Solothurn.
8.20 p.m.—Orchestral Concert. In the interval at 9.0 p.m.—News and Weather.
9.40 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia)
1,076 kc/s (279 m.); 12.5 kw.
Transmits at intervals from 10.15 a.m.
6.0 p.m.—Programme from Prague.
9.15 p.m.—Concert from the Café Avion, Brno, 878 kc/s (342 m.).
9.55 p.m.—Programme Announcements; News.

BRESLAU (Germany)
923 kc/s (325 m.); 2 kw. Relay by Gleiwitz, 1,184 kc/s (253 m.).
Transmits at intervals from 10.15 a.m.

6.10 p.m.—Concert of Works by Heinrich Kaminski.
7.5 p.m.—Talk: Current Events.
7.30 p.m.—Concert of Music by Paul Lincke, conducted by the Composer. Overture, "Frau Luna." Waltz, O Frühling, wie bist Du so schön. Gavotte, Heimlich, still und leise. Wenn Kalkulators in die Baumblüte ziehn. Am Meeresstrand. Mazurka, Schenk' mir doch ein kleines bischen Liebe. Wenn die Blätter leise rauschen. Polka, Mit Schwung. Ich lass' mich nicht verführen. Hinterm Ofen sitzt 'ne Maus. March, Jahrmärts-rummel. Was nicht Worte sagen können, from "Venus auf Erden." March, Folies bergères. Selections from "Princess Rosina" and "Nakisir Hochzeit." Rollschuh-lied. Boston, Solche Augen, wie die Deine. Glow-worm, Idyll. Duet, Küsse mich, dann lieb' ich Dich, from "Grigri." March, Berliner Luft.
9.10 p.m.—News Bulletin.
9.35 p.m.—Answers to Correspondents.

BRSSELS (Belgium)
Radio-Belgique 590 kc/s (508.5 m.); 1 kw.
5.0 p.m.—Concert of Trio Music. Selection from "Carmosine" (Février). Violin Solos. Garden of Love (Wood). Marquise (Massenet). Très jolie (Waldteufel). Piano-forte Solos. Selection from "The Czardas Princess." (Kálmán). Cello Solos. Intermezzo (Mandl).
6.0 p.m.—Talk: The Art of reading a Book.
6.15 p.m.—Lesson in Esperanto, conducted in Flemish.
6.30 p.m.—Gramophone Selections.
7.30 p.m.—Le Journal parlé.
8.15 p.m.—Orchestral Concert. The Lion (Schmitt). Histoire pour Bébé (Dejoncker). Petite Polonaise (Dejoncker). Four Selections (d'Ambrosio): (a) En badinant, (b) Air de danse, (c) Napoli Serenade, (d) Feuilles éparées. Songs. Petite Suite (Kalkman).
9.0 p.m.—Third Transmission of "Music Hall" Wireless Vaudeville (Fleischmann) with the Author as Master of the Ceremonies. First Part: Prologue. Second Part: "Under the Sign of the Aerial." Third Part: The Show.
9.50 p.m.—Dance Music.
10.15 p.m.—News Bulletin.

BUDAPEST (Hungary)
545 kc/s (550 m.); 20 kw.
Transmits at intervals from 8.15 a.m.
4.40 p.m.—Concert of Light Music.
5.50 p.m.—Italian Language Lesson.
6.30 p.m.—"Il Trovatore" (Verdi), relayed from the Royal Hungarian Opera House.
9.30 p.m. (approx.)—Time, Weather, News, and Tziganic Concert from the Hotel Hungaria.

COLOGNE (Germany)
Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw.
See Langenberg Programme.

COPENHAGEN (Denmark)
1,067 kc/s (281 m.); 0.75 kw. Relay by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
5.50 p.m.—Meteorological Report.
6.0 p.m.—News Bulletin.
6.15 p.m.—Time Signal.
6.16 p.m.—Talk on Hygiene.
6.45 p.m.—Talk: New Tendencies in Philosophy.
7.15 p.m.—"The Hansen Family"—Humorous Episode (Locher).
7.30 p.m.—1.0 a.m. (Thursday)—Radio Ball.
7.30 p.m.—Concert of Old Dance Music.
8.30 p.m.—News Bulletin.
7.45 p.m.—Modern Dance Music.
10.15 p.m.—Dance Music from the Palace Hotel.
11.0 p.m. (In the interval)—Town Hall Chimes.
11.30 p.m.—Dance Music from Nimb's Restaurant.
1.0 a.m. (Thursday)—Close Down.

CORK (Ireland)
(6CK). 1,337 kc/s (225 m.); 1 kw.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)
Polskie Radio. 959 kc/s (313 m.); 0.5 kw.
Transmits at intervals from 10.58 a.m.
6.50 p.m.—Programme Announcements.

5.58 p.m.—Time Signal.
7.0 p.m.—Vocal and Pianoforte Recital.
9.10 p.m.—Programme from Warsaw.
9.10 p.m.—Chimes from Notre Dame.
DUBLIN (Ireland)
(2RN). 725 kc/s (413 m.); 1 kw.
1.30 p.m.—Time, Weather, Exchange and Gramophone Records.
6.0 p.m.—Gramophone Selections.
6.15 p.m.—Programme for Children.
7.0 p.m.—Talk for Women.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time; Irish Lesson.
7.45 p.m.—German Language Lesson.
8.0 p.m.—Concert. No. 1 Army Band, Margaret Dempsey (Soprano). The Clonster School of Music in a varied Programme. Elizabeth Young and Company: Sketch. John Lynsky (Baritone) The Station Orchestra.
10.30 p.m.—Time, News, Weather Report and Close Down.

FRANKFURT-am-MAIN (Germany)
770 kc/s (390 m.); 1.5 kw. Relay by Casel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.30 a.m.
3.0 p.m.—Programme from Stuttgart.
5.0 p.m.—(From Mannheim). Talk: Women as Mothers.
5.30 p.m.—French Literature.
5.45 p.m.—French Language Lesson.
6.15 p.m.—Natural Science Talk.
6.30 p.m.—Gramophone Concert.
7.0 p.m.—Concert by the International Society for Modern Music (Frankfurt Branch), relayed from the Concert Hall of the Städtchen Institute, Frankfurt. String Quartet (Zillig). Four Pieces for Violin and Pianoforte (A von Weber). Octet for Eight Instruments (Edgar Varèse.) String Quartet (Ernst Popping).
8.30 p.m.—(From Casel). "The Fall of the House of Usher"—Musical Wireless Play after the Tale by E. A. Poe. (Joho Music by Eugen Bodart).
9.30 p.m. (approx.)—Silent Night.

HAMBURG (Germany)
Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relay by Bremen, 941 kc/s (319 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.20 a.m.
3.30 p.m.—(from Hanover). Orchestral Concert of Biblical Music. Suite from the Oratorio "King David" (Honegger). Vocal Solo: Psalm III (Kornitzer). Selection from "King David" Song (Levan-dowsky). Saul's Camp and The Coronation of Solomon from "King David." Vocal Solo: Psalm No. 16 (Alter). The Lament of Gilboa and The Death of David from "King David."
4.30 p.m.—Recital of Folk Duets for Soprano and Contralto.
5.15 p.m.—Variety Concert.
6.0 p.m.—Talk: North German Nationality.
6.25 p.m.—Talk: School and the Child—The Building-up of our School System.
6.45 p.m.—Exchange; Market Prices.
6.50 p.m.—Weather Report.
6.55 p.m.—"Così fan tutte"—Opera-comique in two Acts (Mozart), from the Stadttheater, Lübeck.
10.0 p.m.—Talks, News, Weather, Sports and Miscellaneous Notes.
10.20 p.m.—Concert from the Café Wallhof.

HILVERSUM (Holland)
1,004 kc/s (298 m.). After 5.40 p.m., 280 kc/s (1,071 m.); 6.5 kw.
9.40 a.m. till 11.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
9.40 p.m.—Time; Daily Service.
11.40 a.m.—Police Announcements.
11.55 a.m.—Quartet Concert.
1.40 p.m.—Gramophone Records.
2.40 p.m.—Talk (to be announced).
3.40 p.m.—Etudes for Pianoforte, with Introductory Talk.
4.10—4.40 p.m.—Interval.
4.40 p.m.—Gramophone Records.
5.10 p.m.—Tziganic Band Concert.
5.40 p.m.—Time (In the interval).
6.10 p.m.—Exchange Quotations.
6.25 p.m.—Italian Language Lesson.
7.25 p.m.—Police Announcements.
7.40 p.m.—Time Signal.
7.41 p.m.—Orchestral Concert. Overture, "Martha" (Flotow). Ballet Music from "Undine" (Lortzing). Torch Dance from "Peramors" (Rubinstein). Selection from "Lohengrin" (Wagner). Tempo di minuetto e Gavotte from "I

Pagliacci" (Leoncavallo). March from "The Queen of Sheba" (Gounod).
8.40 p.m.—Concert of 'Cello, Violin and Pianoforte Music by the Dresden Trio. Trio in E Major, No. 542 (Mozart). Sonata in E Minor (Veracini). Trio in A Minor (Pizzetti).
9.40 p.m.—Orchestral Concert. Spanish Comedy Overture (Kéler-Béla). Waltz, Seid umschlungen, Millionen (Strauss). Spieluhr und Poppentanz (Schebek). Fantasia, Streiflichter (Morena). March, Sie kommen! (Lincke); followed by Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)
160 kc/s (1,875 m.); 6.5 kw.
7.55 a.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55 a.m.—Morning Concert.
9.10 a.m.—10.10 a.m.—No Transmission.
10.10 a.m.—Programme for Hospitals.
10.40 a.m.—Gramophone Records.
11.10 a.m.—Organ Recital.
12.10 p.m.—Songs, with Violin, 'Cello and Pianoforte Music.
1.40 p.m.—Concert of Violin and Pianoforte Music.
2.25 p.m.—Reading by Miss Wentink: Pianoforte Music.
2.55 p.m.—Concert (contd.).
3.55—4.40 p.m.—Interval.
4.40 p.m.—Programme for Children.
5.40 p.m.—Technical Talk.
6.40 p.m.—Programme for Young People.
7.40 p.m.—Talk by Mr. A. v.d. Deure, President of the N.C.R.V.
8.10 p.m.—Orchestral Concert. Recitations. Three Verses from Psalm 116. Hymn, Boven de starren en 's Hemels boog (de Heer). Overture, "Egmont" (Beethoven). Violin Solo: Prelude to "Le Déluge" (Saint-Saëns). Recitations. Overture, "The Marriage of Figaro" (Mozart). Invitation to the Waltz (Weber). Cello Solo: Serenade (Drigo). Suite égyptienne (Luigini).
At 9.40 p.m.—(In the Interval) Talk by Mr. W. D. P. Stenfort. News after the Programme.

KALUNDBORG (Denmark)
Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)
Polskie Radio. 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m.
7.30 p.m.—Programme from Warsaw.
9.0 p.m.—Weather, Programme Announcements in French and News.
9.10 p.m.—Reading (Meyerhold).
9.25 p.m.—Programme from Warsaw.
9.35 p.m.—Press Review.
10.0 p.m.—Answers to Correspondents in French, for Foreigners.

KÖNIGSBERG (Germany)
Ostnarkern Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relay by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
5.15 p.m.—(from Danzig)—Talk: The Educational Reforms in Europe since the War.
5.45 p.m.—Quartet, Op. 18, No. 6 (Beethoven), on Gramophone Records.
6.15 p.m.—Topical Talk.
6.30 p.m.—Talk: Correct German.
6.55 p.m.—Weather Report.
7.0 p.m.—Greetings!—a Variety Programme.
8.45 p.m.—Dancing Lesson.
9.15 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Dance Music relayed from Berlin (Witzleben).
11.30 p.m. (approx.)—Close Down.

LAHII (Finland)
167 kc/s (1,800 m.); 40 kw. Relay by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
5.45 p.m.—Orchestral Concert.
6.30 p.m.—Talk (to be announced).
6.50 p.m.—Recital of Songs.
7.5 p.m.—Accordion Recital of Dance Music.
7.45 p.m.—News in Finnish.
8.0 p.m.—News in Swedish.

LANGENBERG (Germany)
Westdeutscher Rundfunk. 635 kc/s (473 m.); 13 kw. Relay by Aix-la-Chapelle, 662 kc/s (453 m.); Cologne, 1,319 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.).
Transmits at intervals from 5.45 a.m.
4.30 p.m.—Concert of Modern Music.
5.30 p.m.—Medical Talk.
5.50 p.m.—Talk: Current Events.
6.0 p.m.—Report on Economics, Weather and Sports Notes.

6.15 p.m.—Reading for Workers.
6.40 p.m.—Talk: Austrian Industry Since the War.
7.0 p.m.—Orchestral Concert. Overture, "Sakuntala" (Goldmark). Suite from "L'Arlesienne" (Bizet). Two pieces for String Orchestra (Grieg): (a) Herzwunden, (b) Letzter Frühling. Mephisto-Waltz (Liszt).
8.0 p.m.—Rudolf Rieth in a Literary Programme with Incidental Music by Gustav Kneip. "Eternal Unrest." Introductory Talk. How the Flame of Life Burns (Jakob Lenz). Prometheus (Goethe, 1774). The Peasants' Insurrection (Börries v. Münchhausen). Piddler Lüng v. Liliencron. The Princes' Tomb (Chr. Schubart). Scene from "The Robbers" (Schiller). Selection from "The Year of the Guillotine" (Victor Hugo). St. Denis' Day (Reck-Malleczewen) from the Pamphlet—"Der hessische Landbote" (Büchner). The Silesian Weavers (Heine). Documents (Wolff—Frenzel). The End of Robert Blum—Nov. 10, 1849 (Robert Blum—E. Sparfeld). Farewell Words of the "Neue Rheinische Zeitung" (Freiligrath). Death to the Rebel (Reinacher). Song of the Fallen (Leon Feuchtwanger). The Revolutionary (Werfel). Selections from the "Marseillaise of Peace" (German by Freiligrath). To All (Barthel). After the Programme, News, Sports Notes and Dance Music from the "Tabaris" Dance Hall, Düsseldorf.
11.0 p.m. (approx.)—Close Down.

LEIPZIG (Germany)
Mitteldeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relay by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m.
5.30 p.m.—Italian Language Lesson.
5.55 p.m.—Labour Intelligence.
6.0 p.m.—Economic Talk: The Building-up of Enterprise and Management.
6.30 p.m.—Military Band Concert.
7.30 p.m.—Willi Fehse reads two Short Stories; followed by "Piano-forte Music, 1929" (Schauble).
8.15 p.m.—Talk with Musical Illustrations: Instruments of the Baroque Period—Wind-Instruments.
9.15 p.m.—Time Signal, Weather, News and Sports Notes, followed by Light Music from the Hotel Bellevue, Dresden.
11.0 p.m. (approx.)—Close Down.

MADRID (Spain)
Unión Radio (EAJT). 707 kc/s (424 m.); 2 kw.
Transmits at intervals from 11.45 a.m.
7.0 p.m.—Chimes, Exchange Quotations and Concert of Chamber Music. Quartet in D Minor (Mozart). Quintet in F Minor (Franck).
8.0 p.m.—Dance Music Programme.
8.25 p.m.—News Bulletin.
8.30—10.0 p.m.—No Transmission.
10.0 p.m.—Chimes, Time, Exchange Quotations and Band Concert from the Hotel Nacional. In the Interval at 12 midnight.—Chimes and News.
12.30 a.m. (Thursday)—Close Down.

MILAN (Italy)
Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 7 kw.
Transmits at intervals from 7.15 a.m.
7.30 p.m.—Time Signal. "Opera (Verdi), with Introductory Talk. In the intervals, Bertarelli and Colantuoni Programmes.
10.30 p.m.—Wireless News. After the Opera, Concert.
11.0 p.m. (approx.)—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia)
1,139 kc/s (263 m.); 10 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—Programme from Prague.
9.15 p.m.—Concert from the Café Avion, Brno, 878 kc/s (342 m.).
9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

MOTALA (Sweden)
223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

MUNICH (Germany)
563 kc/s (533 m.); 1.5 kw. Relay by Augsburg, 536 kc/s (560 m.); Kaiserslautern, 1,112 kc/s (270 m.); and Nuremberg, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m.
6.5 p.m.—Soprano Song Recital, relayed from Nuremberg.

Programmes for Wednesday—(Cont.)

6.35 p.m.—Concert of Military Band Music.
 7.40 p.m.—"Zwischen Vorder- und Hinterhaus"—a Sketch (Weichand).
 8.10 p.m.—Light Chamber Music.
 Overture, "William Tell," arranged for Clarinet, Bassoon and Horn (Rossini-Rupprecht). Suburban Sketches—Musical Caricatures (after H. Zille). A.B.C.—Fourteen Variations on a well-known Children's Song for Horn, Bassoon and Piano (Rupprecht).
 9.0 p.m.—A Cable from Berne.
 9.20 p.m.—News Bulletin.
 9.45 p.m.—Quartet Music from the Café Neue Borse.

OSLO (Norway)
 Kringkastingselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by Fredrikstad, 761 kc/s (394 m.); Hamar, 527 kc/s (570 m.); Norderen, 1,058 kc/s (283 m.); Porsgrund, 662 kc/s (453 m.).
 Transmits at intervals from 10.10 a.m.
 6.15 p.m.—Weather and News.
 6.30 p.m.—Talk from Oslo University.
 7.0 p.m.—Time Signal.
 7.2 p.m.—Orchestral Concert.
 8.0 p.m.—Talk: A Journey through Poland.
 8.30 p.m.—Weather and News.
 8.50 p.m.—Topical Talk.
 9.5 p.m.—Recital of Light Songs.
 9.35 p.m.—Gramophone Dance Records.
 11.0 p.m. (approx.)—Close Down.

PARIS (France)
 Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
 Transmits at intervals from 8.0 a.m.
 6.30 p.m.—Radio-Journal de France.
 8.0 p.m.—English Lesson, arranged by the Berlitz School.
 8.30 p.m.—Literary Talk.
 8.45 p.m.—Concert of Old French Successes, followed by News, Time, Weather and Dance Music from the Coliseum de Paris.
 12 midnight (approx.)—Close Down.

PARIS (France)
 Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.
 7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).

5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Symphony Concert.
 Scherzo (Moussorgsky-Salabert). Violin Solos: (a) Romance in G (Beethoven), (b) Rondo capriccioso (Saint-Saëns). Pavane pour une Infante défunte (Ravel). Songs: (a) The Page's Aria from "The Huguenots" (Meyerbeer), (b) Chanson de Barberine (de Musset-Leret). Minuet (Schubert-Salabert). Piano Solo: (a) Etude in A Flat (Chopin), (b) Liebestraum (Liszt), (c) The Blue Danube (Strauss). Danses anciennes for String Quartet and Piano (Vidal). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)
 Petit Parisien. 914 kc/s (329 m.); 0.5 kw.
 8.30 p.m.—Transmission of Pictures.
 9.0 p.m.—Quintet Concert. Overture "Mozart" (Hahn). Canzonetta from the Romantic Concerto (Godard). Entr'acte Gavotte from "Mignon" (Thomas). Selection from "Les noces de Jeannette" (Massé). Sonata in C Minor for Piano and Violin (Grieg). Trio Serenade for Violin, Viola and Cello (Beethoven). Minuet, for Viola d'amore (Milandre). Selection from "Fortunio" (Messager). Nocturne (Paray). Romance (Louis Aubert). A Doll's Wedding March (Lecocq).

PARIS (France)
 Radio-Paris (CFR). 174 kc/s (1,725 m.); 12 kw.
 Transmits at intervals from 6.45 a.m.
 12.30 p.m.—Gramophone Concert. In the interval at 1.0 p.m.—Exchange Quotations and News.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Concert. Orchestral Selection: Overture, "The Merry Wives of Windsor" (Nicolai). Concerto for Cello (Boccherini). Orchestral Selection, Les Bergers d'Arcadie (Flament). Etudes for Piano (Zoubaïoff). Orchestral Selection, L'Escarpolette (Trémisot). Violin Solos (Lalo): (a)

Chants russes, (b) Intermezzo. Orchestral Selection, Hélène (Messager).

4.55 p.m.—News and Exchange.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.30 p.m.—New York Exchange Rates.
 6.35 p.m.—Gramophone Concert.
 7.15 p.m.—Talk: Modern Meteorology.
 7.45 p.m.—Commercial Prices, Economic and Social Notes and Amusement Guide.
 8.0 p.m.—"Peer Gynt"—Dramatic Poem (Ibsen—Music by Grieg), by M. Lugne-Poe and his Company. In the intervals, at 8.30 p.m.—American Closing Prices and Sports Notes, and at 9.15 p.m.—Press Review and Time Signal.

PITTSBURGH (U.S.A.)
 Westinghouse Electric (KDKA). 980 kc/s (306 m.); 25 kw.
 Transmits at intervals from 1.30 p.m.
 11.45 p.m.—Dixie Steppers.
 12 midnight-5.0 a.m. (Thursday)—New York Relay.
 5.0 a.m.—Champion Weather Reports.
 5.2 a.m.—Don Bestor's Recording Orchestra.

POSEN (Poland)
 896 kc/s (335 m.); 1.2 kw.
 Transmits at intervals from 12 noon.
 7.5 p.m.—Review of Books.
 7.30 p.m.—Concert in honour of General Mariusz Zarusky. Programme of Military Band Music and Recitations. In the intervals: Theatre and Station Notes.
 9.0 p.m.—Time, Sports Notes and News Bulletin.
 9.15 p.m.—Transmission of Pictures.
 9.45 p.m.—Dance Music, relayed from the Carlton Restaurant.
 11.0 p.m. (approx.)—Close Down.

PRAGUE (Czechoslovakia)
 Stranice. 617 kc/s (487 m.); 5 kw.
 Transmits at intervals from 10.15 a.m.
 6.0 p.m.—Time and News.
 6.5 p.m.—Talk: The Stage Management of Opera.
 6.45 p.m.—Talk on the following Transmission.
 7.0 p.m.—Concert by the Czech Philharmonic Orchestra relayed from the Smetana Hall. Programme from the Works of Foerster.
 9.0 p.m.—Time, News and Sports Notes.

9.15 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

ROME (Italy)
 Ente Italiano Audizione Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw.
 Transmits at intervals from 12 noon.
 7.30 p.m.—News, Weather, Wireless Notes and Time Signal.
 8.2 p.m.—"Lilac Time"—Operetta in Three Acts (Schubert). In the intervals, Talks.
 10.5 p.m.—News Bulletin.

STOCKHOLM (Sweden)
 Radiotjänst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 6.15 p.m.—Talk: Alcohol and Economics.
 6.45 p.m.—Concert of Opéra-Comique Music. Soprano and Tenor Duets; (a) Duet from "Red Roses" (Lénárd), (b) Duet from "Zigeuner-primas" (Kálmán). Tenor Solos: (a) Aria from "Der lachende Elchmann" (Eysler), (b) Lagoon Waltz from "A Night in Venice" (Joh. Strauss). Soprano Solo from "The Duchess of Chicago" (Kálmán). Soprano and Tenor Duets: (a) Duet from "Die Kaiserin" (Fall), (b) Duet from "The Czardas Princess" (Kálmán).

7.45 p.m.—"Le Carosse du Saint Sacrement" Play in One Act (Prosper Mérimée).
 8.15 p.m.—(In the Interval) News and Weather.
 8.40 p.m.—Talk on Auction Bridge.
 9.0 p.m.—Dance Music Programme.
 10.0 (approx.)—Close Down.

STUTTGART (Germany)
 Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by Freiburg. 527 kc/s (570 m.).
 Transmits at intervals from 9.0 a.m.
 3.0 p.m.—Orchestral Concert.
 4.45 p.m.—Time, Weather and Agricultural Notes.
 5.0 p.m.—(from Mannheim). Talk for Women: Women as Mothers.
 5.30 p.m.—Talk: Among Wild Indians.

6.0 p.m.—(from Freiburg). Talk: What is Public Opinion?
 6.30 p.m.—Soprano and Tenor Recital of Folk Songs of other Lands, translated into German. The Programme includes The Last Rose of Summer, and My Heart's in the Highlands.
 7.0 p.m.—Programme from Frankfurt.
 9.30 p.m.—News Bulletin.
 9.45 p.m.—Silent Night for Distant Reception.

TURIN (Italy)
 Ente Italiano Audizioni Radiofoniche (ITO). 1,030 kc/s (291 m.); 7 kw.
 Transmits at intervals from 7.15 a.m.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Programme from Milan followed by Concert. In the interval at 10.30 p.m.—Wireless News.
 11.0 p.m. (approx.)—Close Down.

VIENNA (Austria)
 Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 10.0 a.m.
 5.15 p.m.—Talk: Brain Work and Mental Hygiene.
 5.45 p.m.—Esperanto Propaganda for Austria.
 6.0 p.m.—Talk for Workers: Changes and Developments in World Industry.
 6.25 p.m.—Time and Weather.
 6.30 p.m.—"Cosi fan tutte"—Opéra-comique in Two Acts (Mozart), relayed from the State Opera House.
 9.0 p.m.—Concert of Light Music and Phototelegraphy Transmission.

WARSAW (Poland)
 Polskie Radio. 212 kc/s (1,411 m.); 8 kw.
 Transmits at intervals from 10.58 a.m.
 7.0 p.m.—Programme Announcements.
 7.15 p.m.—Talk: My Boys.
 7.30 p.m.—Concert by the Prize-winners of the Prague Academy of Music, relayed from the Conservatoire.
 9.10 p.m.—Talk: Religious Orders.
 9.25 p.m.—Talk and News.
 10.0 p.m.—Dance Music, relayed from the Hotel Bristol.
 11.0 p.m. (approx.)—Close Down.



PUSH - PULL AMPLIFICATION

Push-Pull amplification, with moderate H.T. Voltages, enables you to handle considerable volume in the output stage without distortion.

In this system the output of the receiver is divided between two valves, or a multiple of two. The product is combined by means of a Push-Pull output transformer and fed to the speaker. A greatly enhanced grid swing is thus permissible and a correspondingly louder signal can be handled without the harshness or "chatter" due to overloaded valves.

A descriptive leaflet, Wb 412, gives full particulars, Transformer details and circuit. It should be in the hands of everyone interested in the combination of ample volume and quality reproduction. Ask your dealer or write direct.

FERRANTI

FERRANTI LTD. HOLLINWOOD LANCASHIRE

PROGRAMMES FOR THURSDAY

(November 28)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)

Radio-Barcelona (EAJr). 860 kc/s (349 m.); 8 kw.
Transmits at intervals from 11.0 a.m. 8.30 p.m.—Elementary English Lesson.
9.0 p.m.—Chimes, Weather, Exchange Quotations and News.
9.5 p.m.—Partial Relay of an Opera (not yet announced) from the Gran Teatro del Liceo; followed by Barcelona Exhibition Notes.

BELGRADE (Yugoslavia)

699 kc/s (429 m.); 2.5 kw.
Transmits at intervals from 9.30 a.m. 6.30 p.m.—French Language Lesson.
7.0 p.m.—Recital for two Pianos. Sonata for two Pianos, and Fugue for two Pianos (Mozart). Fantasia on Der Wanderer (Schubert-Liszt).
8.0 p.m.—A Comedy in One Act (Zijen and Flers).
8.45 p.m.—Time and Weather.
8.55 p.m.—Quartet Concert.

BERLIN (Germany)

Königswusterhausen. 183 kc/s (1,635 m.); 26 kw.
Transmits at intervals from 5.55 a.m. 3.30 p.m.—See Berlin (Witzleben).
4.30 p.m.—Talk: The History of the Fable.
5.0 p.m.—Talk: The Character and Destiny of Great Explorers—Alexander von Humboldt.
5.30 p.m.—Advanced Spanish Lesson.
5.55 p.m.—Talk: More and Better Milk the Aim of the Farmer.
6.20 p.m.—Commercial Talk.
7.0 p.m.—See Berlin (Witzleben).
7.30 p.m.—Programme from Breslau.
7.55 p.m.—Concert from the Works of Rubinstein, on the Centenary of his Birth. Pianoforte Solos: (a) Barcarolle in F Minor, (b) Polka in G Major, (c) Gondoliera in F Sharp Major, (d) Valse caprice. Contralto Solos: (a) Neig, schöne Knospe, (b) Es blinkt der Tau, (c) Du bist wie eine Blume, (d) Am Meerstrand, (e) Neue Liebe. Sonata in D Major, Op. 18, for Cello and Pianoforte; followed by News, Dancing Lesson, Dance Music and Picture Transmission from Berlin (Witzleben).
11.30 p.m. (approx.).—Close down.

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.5 kw.
Transmits at intervals from 5.55 a.m. 3.30 p.m.—Concert of Light Music.
5.0 p.m.—Stefan Grossmann reads three of his Short Stories: (a) "Strindberg-Anekdoten," (b) "Camilla vor der Tür," (c) "Das Kiefern."
5.30 p.m.—Concert of Light Music.
6.0 p.m.—Talk: Anton Rubinstein.
6.30 p.m.—Concert from the Works of Old and Modern Masters. Miserere mei and Protestation of Love (della Lasso). Wedding Song and Hans und Grete (Eccard). Einssamkeit und Frau Nachtigall (Koesler). Am Brünnelein und Kirmes auf dem Berge (Lendoai). Two Folk-Songs: (a) Zu Ihren Füssen, (b) Trübsinn (von Ottergraven).
7.0 p.m.—Topical Talk.
7.30 p.m.—Violin Recital. Concerto in A Minor (Vivaldi). Sicilienne (Bach). Rondo (Schubert). Concerto in A Minor (Goldmark).
8.30 p.m.—Reading of Ballads, followed by Time, Weather, News and Sports Notes.
9.30 p.m.—Dancing Lesson, followed by Dance Music. Picture Transmission in the interval.
11.30 p.m. (approx.).—Close down.

BERNE (Switzerland)

Radio-Bern. 743 kc/s (403 m.); 1 kw.
Transmits at intervals from 11.43 a.m. 6.28 p.m.—Time and Weather.
6.30 p.m.—Talk: The Musical Life of Berne.
7.0 p.m.—Concert of French Chamber Music. Fantasia for Violin and Harp, Op. 124 (Saint-Saëns). Trio for Flute, Viola and Harp (Debussy).
7.45 p.m.—Orchestral Music.
8.0 p.m.—Programme in celebration of the Centenary of the Birth of Anton Rubinstein. Introductory Talk. Pianoforte Recital. Introduction, Royal Tambour et Vivandière and Toréador et Andalouse, from "Un Bal costumé." Pianoforte Solos.
8.40 p.m.—Orchestral Concert from the Works of Dvorak.
9.0 p.m.—News and Weather.
9.15 p.m.—Concert of Slavonic Music from the Works of Smetana,

Weninger and Tcherepnine.
9.40 p.m. (approx.).—Close Down.

BRATISLAVA (Czechoslovakia)

1,076 kc/s (279 m.); 12.5 kw.
Transmits at intervals from 10.30 a.m. 6.0 p.m.—Programme from Prague.
6.5 p.m.—Concert of Vocal and Orchestral Music.
7.0 p.m.—Programme from Prague.
9.15 p.m.—Band Concert from Brno (878 kc/s, 342 m.).
9.55 p.m.—Programme Announcements and News.

BRESLAU (Germany)

923 kc/s (325 m.); 2 kw. Relay by Gleiwitz, 1,184 kc/s (253 m.).
Transmits at intervals from 8.30 a.m. 6.10 p.m.—"When Grandpapa asked Grandmamma . . ." Gramophone Records.
7.5 p.m.—Talk: Sixty Years of Darwinism.
7.30 p.m.—New Wireless Music Suite, The Musical Picture-Book of a Town (Sczuka).
7.55 p.m.—"Ich, der Groszstadt-mensch"—Variety Programme (Solani).
8.20 p.m.—Berlin Songs, by Wolfgang Zilzer and the Station Orchestra.
9.10 p.m.—News Bulletin.
9.30 p.m.—See Berlin (Witzleben).
10.0 p.m.—Dance Music.
11.0 p.m. (approx.).—Close Down.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1 kw.
5.0 p.m.—Concert from the Armonen-ville Tea-rooms.
6.0 p.m.—Flemish Language Lesson arranged by the Berlitz School.
6.30 p.m.—Gramophone Concert.
7.30 p.m.—Le Journal Parlé.
8.0 p.m.—Concert relayed from the Concert Hall, Amsterdam. In the Interval, Topical Talk. After the Concert, News.

BUDAPEST (Hungary)

545 kc/s (550 m.); 20 kw.
Transmits at intervals from 8.15 a.m. 5.50 p.m.—Shorthand Lesson.
6.25 p.m.—English Language Lesson.
6.55 p.m.—Racing Results.
7.0 p.m.—Concert on the occasion of the Centenary of the Birth of Rubinstein. Introductory Talk. Fantasia on Hungarian Melodies. Pianoforte Trio in D Major. Songs. Orchestral Suite in E Flat Major, Op. 119.
8.40 p.m.—Talk in English, arranged by the Hungarian Society for Foreign Politics: The History of British-Hungarian Relations.
9.15 p.m.—Time, Weather, News and Tzigane Concert from the Café Baross.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw.
See Laugenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 0.75 kw. Relay by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m. 5.50 p.m.—Meteorological Report.
6.0 p.m.—News Bulletin.
6.15 p.m.—Time Signal.
6.16 p.m.—Talk: Danish History.
6.45 p.m.—Talk from the Aalborg Studio.
7.15 p.m.—Orchestral Concert from the Concert Hall Studio in Axelborg. Overture, "La Cenerentola" (Rossini). Andante for Strings, Harp and Organ (Gemini). Old Dances and Arias of the Sixteenth and Seventeenth Centuries (arr. for Orchestra by Respighi). Ballet Music from "Il Conte Orlando" (Molinaro). Gagliarda, Villanella and Passo mezzo e Mascherate (Galilei). Danza rustica (Besardo). Bergamasca (Gianoncelli). Overture No. 1 in C Minor (Foroni). Recitative and Aria from "William Tell" (Rossini). Melody—Pace, pace, mio Dio, from "The Force of Destiny" (Verdi). Nocturne (Martucci). Presto, Fuga degli amanti a Chiozza (Mancinelli). Symphonic Intermezzo from "Manon Lescaut" (Puccini). Symphonic Intermezzo from "William Ratcliff" (Mascagni). Hymn to the Sun, from "Iris" (Mascagni). News after the Programme.
9.30 p.m.—Dance Music from the Hotel d'Angleterre.
11.0 p.m. (in the interval).—Town Hall Chimes.
12 midnight (approx.).—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1 kw.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.

CRACOW (Poland)

Polskie Radio. 959 kc/s (313 m.); 0.5 kw.
Transmits at intervals from 10.58 a.m. 6.25 p.m.—Talk: Wyspiansky, on the Anniversary of his Death.
6.58 p.m.—Time Signal.
7.0 p.m.—Chimes from Notre Dame.
7.5 p.m.—Programme from Warsaw.
10.0 p.m.—Orchestral Concert, relayed from the Pavilion Restaurant.
11.0 p.m.—Chimes and Close Down.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1 kw.
1.30 p.m.—Time, Weather, Exchange and Gramophone Selections.
6.0 p.m.—Gramophone Selections.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Selections.
7.10 p.m.—News Bulletin.
7.30 p.m.—Time Signal.
7.32 p.m.—French Language Lesson.
7.45 p.m.—Talk on History.
8.0 p.m.—Concert. The Station Orchestra: Symphonie fantastique, Nos. 2 and 4 (Berlioz). Florence Howley (Contralto). German Music by the Station String Orchestra. Mme. Erni Ritter: German Folk Songs. Arthur Darley (Violinist), E. Guise Brown (Baritone).
9.15 p.m.—Relay of Plaza Dance Band.
10.30 p.m.—News, Weather, Time Signal and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.5 kw. Relay by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.30 a.m. 3.0 p.m.—Orchestral Concert.
5.0 p.m. (from Cassel).—Ten Minutes' Dialogue.
5.10 p.m.—Talk: The Duties of an Interpreter during a Meeting of the League of Nations.
5.30 p.m.—Lesson in Esperanto.
5.50 p.m.—(Frankfurt only)—Hints for Ramblers by the Taunus Club.
6.0 p.m.—Programme arranged by the Frankfurter Zeitung.
6.30 p.m.—Xylophone and Tubaphone Recital.
7.0 p.m.—Programme from Stuttgart.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relay by Bremen, 941 kc/s (319 m.); Plensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.20 a.m. 4.0 p.m.—Recital of Vocal and Orchestral Music. Finlandia (Sibelius). Songs: (a) Auf dem Meere (Franz), (b) Ave Maria (Plüdemann). Nocturne from "A Midsummer Night's Dream" (Mendelssohn). Songs: (a) Heimweh, (b) Im Meer der Liebe (Wolf). Dance from "A Midsummer Night's Dream" (Mendelssohn). Songs: (a) Verspruch, (b) Königin (Graener). Spanish Dance No. 3 (Moszkowsky). Love Song from "Die Walküre" (Wagner). Spanish Dance No. 4 (Moszkowsky).
4.50 p.m.—Variety Concert.
5.40 p.m.—Talk: Woman as the Creator of the Children's Theatre.
6.25 p.m.—Talk: Light as a Means of Healing.
6.50 p.m.—Exchange and Weather.
7.0 p.m.—Recital of German Folk Songs by the "Nordmark" Choral Society (1,000 Voices)—A Branch of the German Choral Society, relayed from the Musikhalle.
8.30 p.m.—Cabaret Programme by "Norag" Artists.
9.30 p.m.—Talks, News, Weather, Sports and Miscellaneous Notes.
9.50 p.m.—Dance Music Programme.

HILVERSUM (Holland)

1,004 kc/s (298 m.). After 5.40 p.m., 280 kc/s (1,071 m.); 6.5 kw.
9.40 a.m. till Close Down.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
9.40 a.m.—Time; Daily Service.
11.40 a.m.—Police Announcements.
11.55 a.m.—Quartet Concert.
1.40 p.m.—Gramophone Records.
2.40 p.m.—Talk (to be announced).
3.10 p.m.—Gramophone Records.
3.40 p.m.—Programme for Hospita's.
4.40—5.10 p.m.—Interval.
5.10 p.m.—Concert relayed from the Café Moderne, Amsterdam.
5.40 p.m.—(In the interval) Time.

6.10 p.m.—Exchange Quotations.
6.25 p.m.—Talk (to be announced).
6.55 p.m.—French Language Lesson.
7.25 p.m.—Police Announcements.
7.40 p.m.—Time Signal.
7.41 p.m.—Gramophone Records.
7.55 p.m.—Concert relayed from the Concert Hall, Amsterdam; followed by Weather and News.
10.25 p.m.—Dance Music from "La Gaité" Cabaret, Amsterdam.
11.40 p.m. (approx.).—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 6.5 kw.
7.55 p.m. till Close Down.—Programme of the Christian Radio Society (N.C.R.V.).
7.55 a.m.—Morning Concert.
9.10 a.m.—9.40 a.m.—Interval.
9.40 a.m.—Choral Concert.
10.10 a.m.—Programme for Hospitals.
10.40 a.m.—Reading by Miss Doyen.
11.10 a.m.—Programme for Country People.
11.55 a.m.—Relay of the Unveiling of Two Memorial Windows in the English Episcopal Church, Amsterdam, by H.M. the Queen of the Netherlands, in the presence of the Bishop of Fulham. Preacher: Pastor W. W. Lucas. Songs by a Vocal Quartet.
12.55 p.m.—Gramophone Records.
1.40 p.m.—Programme for Schools.
2.15—2.25 p.m.—Interval.
2.25 p.m.—Lesson in Art.
3.25—3.40 p.m.—Interval.
3.40 p.m.—Programme for Hospitals.
4.40 p.m.—Talk by Dr. Esselink.
5.40 p.m.—Talk by Mr. Goote.
6.10 p.m.—Organ Recital.
7.10 p.m.—Lesson in Malay.
7.40 p.m.—Concert by the Arnhem Orchestra. Overture, "Il Seraglio" (Mozart). Concerto for Violin (Nardini). Symphony in B flat Major (Bach). Gramophone Records. Overture, "Carnaval romain" (Berlioz). Rondo capriccioso (Saint-Saëns). Sérénade melancolique (Tchaikovsky). Spanish Rhapsody (Ravel); followed by News Bulletin.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m. 6.58 p.m.—Time Signal.
7.5 p.m.—Programme from Warsaw.
8.0 p.m.—Reading.
8.15 p.m.—Programme from Warsaw.
9.15 p.m.—Talk: The Meaning of the F.I.D.A.C.
9.35 p.m.—Press Review.
10.0 p.m.—Dance Music.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relay by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m. 6.15 p.m.—Topical Talk.
6.30 p.m.—English Language Lesson.
6.55 p.m.—Weather Report.
7.0 p.m.—Concert of Light Music from the Alhambra Konditorei.
7.30 p.m.—Programme from Breslau.
7.55 p.m.—(from Danzig) "Destinies"—Recitations by Edith Herrstadt-Oettingen.
8.40 p.m.—Concert on the occasion of the Centenary of the Birth of Rubinstein. Baritone Solos: (a) Sehnsucht, (b) Geld rollt mir zu Füßen, (c) Es blinkt der Tau. Sonata for Violin and Pianoforte. Baritone Solos: (a) Ser Asra, (b) Die Nacht.
9.15 p.m. (approx.).—Weather, News, Sports Notes and Silent Night.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 639 kc/s (473 m.); 13 kw. Relay by Aix-la-Chapelle, 662 kc/s (453 m.); Cologne, 1,319 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.).
Transmits at intervals from 5.45 a.m. 4.30 p.m.—Instrumental Concert.
5.30 p.m.—Talk: Good German.
5.50 p.m.—Talk: Current Events.
6.0 p.m.—Report on Economics, Weather and Sports Notes.
6.15 p.m.—Spanish Language Lesson.
6.40 p.m.—Talk for Young People: The War and its Legacy to the Girls of To-day.
7.0 p.m.—Orchestral Concert. Rakoczy March (Liszt). Hungarian Rhapsody, for Cello with Orchestral Accompaniment (Popper). Suite, Aus aller Herren Länder (Moszkowsky). Norwegian Rhapsody, No. 2 (Svendens).
7.30 p.m.—Programme from Breslau, followed by Concert (continued). Caprice for Pianoforte and Orchestra (Rubinstein). The Ocean

Symphony for Pianoforte (Rubinstein). After the Programme, News, Sports Notes, Commercial Announcements and Dance Music.
11.0 p.m. (approx.).—Close Down.

LAHTI (Finland)

167 kc/s (1,800 m.); 40 kw. Relay by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m. 4.0 p.m.—Programme for Children.
4.30 p.m.—Recital of Songs. Dein blaues Auge (Brahms). Über Nacht (Wolf). Skymning (Järnefeldt). Drömvisa (Palmgren). Aria from "Martha" (Flotow).
4.59 p.m.—Time and Weather.
5.10 p.m.—News Bulletin.
5.15 p.m.—Talk (to be announced).
5.40 p.m.—Musical Interlude.
6.5 p.m.—Recitations.
6.30 p.m.—Orchestral Concert with Xylophone Solos.
7.45 p.m.—News in Finnish.
8.0 p.m.—News in Swedish.

LEIPZIG (Germany)

Mitteldeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relay by Dresden, 941 kc/s (319 m.).
Transmits at intervals from 9.0 a.m. 3.30 p.m.—Concert. Overture, "Hermann und Dorothea," Op. 136 (Schumann). Songs: (a) Der Traum, (b) Sehnsucht, (c) Es war ein alter König, (d) Du bist wie eine Blume, (e) Der Asra (Rubinstein, born 28th November, 1829). Two Intermezzi (Gal). Entr'acte from the Music to "The Tempet" Op. 65 (Weingartner).—Songs: (a) Romance, (b) Es blinkt der Tau, (c) Verlust, (d) Die Träne (Rubinstein). Ländliches Tanzidyll, Op. 13 (von Vignau).
4.55 p.m.—Economic Notes.
5.5 p.m.—Talk on Taxation.
5.20 p.m.—Weather and Time.
5.30 p.m.—See Königswusterhausen.
5.55 p.m.—Labour Intelligence.
6.0 p.m.—Talk: Domestic Architecture since the War.
6.30 p.m.—Folk Song Recital.
7.15 p.m.—Discussion: The Author and his Times.
7.45 p.m.—Orchestral Concert. Symphony No. 7 (Bruckner). Mozart Variations (Busch). Carnevals-Episode (Blumer).
9.30 p.m.—Time Signal, Weather, News and Sports Notes, followed by Silent Night.

LJUBLJANA (Yugoslavia)

Radio-Ljubljana. 530 kc/s (566 m.); 2.5 kw.
Transmits at intervals from 11.30 a.m. 6.0 p.m.—Serbo-Croatian Lesson.
6.30 p.m.—Transmission of an Opera.
9.15 p.m.—Time, News and Programme Announcements.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kw.
Transmits at intervals from 11.45 a.m. 7.0 p.m.—Chimes. Exchange Quotations and Dance Music.
7.25 p.m.—News and Station Notes.
8.30—10.0 p.m.—No Transmission.
10.0 p.m.—Chimes, Time Signal, Exchange and Selections for Soloist, Choir and Orchestra from "Carmen"—Opera (Bizet).
12 midnight.—Chimes, News and Dance Music from the Palacio de Bellas Artes.
12.30 a.m. (Friday).—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 7 kw.
Transmits at intervals from 7.15 a.m. 7.15 p.m.—Wireless News, Topical Talk and Time Signal.
7.30 p.m.—Literary Review.
7.45 p.m.—Relay of a Comedy.
8.15 p.m.—Variety Concert.
10.30 p.m.—Wireless News.
10.40 p.m. (approx.).—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia)

1,139 kc/s (263 m.); 10 kw.
Transmits at intervals from 10.30 a.m. 6.0 p.m.—Programme from Prague.
6.5 p.m.—Programme from Brno, 878 kc/s (342 m.). Concert from the Works of Rubinstein, followed by Talk: Contemporary Literature of Yugoslavia.
7.0 p.m.—Programme from Prague.
9.15 p.m.—Military Band Music from Brno.
9.56 p.m.—Programme and Miscellaneous Notices; Theatre Review.

MOTALA (Sweden)

223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

Programmes for Thursday—(Cont.)

MUNICH (Germany)

593 kc/s (533 m.); 1.5 kw. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserlautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).
 Transmits at intervals from 5.45 a.m.
 6.30 p.m.—Concert of Operetta Music and Waltzes. Overture, "Das Spitzentuch der Königin" (Joh. Strauss). Waltz, "The Princesses" (Asher). Two Songs: (a) Die Liebe kam vom Märchenland and (b) Ob du mich liebst from "Nakiris Hochzeit" (Lincke). Waltz, "Sirenenzauber (Waldfel)" Selection from "The Gipsy Baron" (Joh. Strauss). Waltz, "Die gute alte Zeit" (J. Strauss). March from "The Mikado" (Sullivan).
 7.30 p.m.—Programme from Breslau.
 8.0 p.m.—Symphony Concert.
 9.20 p.m.—News Bulletin and Economic Review.

OSLO (Norway)

Kringkastingselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by Fredrikstad, 761 kc/s (394 m.); Hamar, 527 kc/s (570 m.); Notodden, 1,058 kc/s (283 m.); Porsgrund, 662 kc/s (453 m.).
 Transmits at intervals from 8.50 a.m.
 6.15 p.m.—Weather and News.
 6.30 p.m.—Elementary German Lesson.
 7.0 p.m.—Time Signal.
 7.2 p.m.—Talk: "The Story of the South Pole."
 7.30 p.m.—Rubinstein Recital.
 8.30 p.m.—Weather and News.
 8.50 p.m.—Topical Talk.
 9.5 p.m.—Oscar Braaten reads from his own works.
 9.35 p.m. (approx.)—Close Down.

PARIS (France)

Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
 Transmits at intervals from 8.0 a.m.
 6.0 p.m.—Lesson in Esperanto.
 6.30 p.m.—Radio-Journal de France.
 8.0 p.m.—German Lesson arranged by the Berlitz School.
 8.30 p.m.—Talk: "The History of a Seed."
 8.45 p.m.—Concert, followed by News, Time and Weather.

PARIS (France)

Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.

7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Concert. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)

Petit Parisien. 914 kc/s (329 m.); 0.5 kw.
 8.30 p.m.—Transmission of pictures.
 8.45 p.m.—Gramophone Records, Talk and News Bulletin.
 9.0 p.m.—Concert. Overture, "Ruy Blas" (Mendelssohn). Gavotte (Boëllmann). Presto from the Seventh Symphony (Beethoven). Intermezzo (Moussorgsky). Forest Murmurs from "Siegfried" (Wagner). Hungarian Dance (Brahms). Triumphal March (Beethoven).

PARIS (France)

Radio-Paris (CFR). 174 kc/s (1,725 m.); 12 kw.
 Transmits at intervals from 6.45 a.m.
 12.30 p.m.—Gramophone Concert.
 In the interval at 1.0 p.m.—Exchange Quotations and News.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Concert arranged by Radio Art et Pensée.
 4.55 p.m.—News and Exchange Quotations.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.30 p.m.—New York Exchange Rates.
 6.35 p.m.—Gramophone Concert.
 7.5 p.m.—Talk on Cannibals.
 7.30 p.m.—Elementary Book-keeping Lesson.
 7.45 p.m.—Market Prices, Economic and Social Review and Amusement Guide.
 8.0 p.m.—Concert. Variety Items by M. Donmel, the Marseilles Comedian. Quintet (Brahms). In the intervals, at 8.30 p.m.—American Closing Prices and Sports Notes, and at 9.15 p.m.—Press Review and Time Signal.

PITTSBURGH (U.S.A.)

Westinghouse Electric (KDKA). 980 kc/s (306 m.); 25 kw.
 Transmits at intervals from 1.30 p.m.
 11.30 p.m.—Dilworth Musical Sketch. 12 midnight.—Kemble and Mills.
 1.0—4.15 a.m. (Friday).—New York Relay.
 4.16 a.m.—McKay Chain Temperature.
 5.0 a.m.—Champion Weather Reports.
 5.2 a.m.—Don Bestor's Recording Orchestra.

POSEN (Poland)

866 kc/s (335 m.); 1.2 kw.
 Relayed on 9,428 kc/s; (31.8 m.) and 9.15-9.45 p.m.
 Transmits at intervals from 6.15 a.m.
 7.0 p.m.—Elementary French Lesson.
 7.30 p.m.—American Programme.
 Organ Solo: The Star-spangled Banner. Recitations. Organ Solos: (a) Hail Columbia, (b) Yankee Doodle, (c) Columbia, the Gem of the Ocean, (d) Hail to the Chiefs.
 Violin Solos: Soprano Solos (Nevin and Grainger). Organ Solos: (a) Cavatina (Ward), (b) Prelude (Walkiewicz). Violin Solos (Spalding). Soprano Solos (Stojewsky). Organ Solos: Polish National Anthem. Theatre and Station Notes in the intervals.
 9.0.—Time; Sports Notes; News.
 9.15 p.m.—Transmission of Pictures.
 9.45 p.m. (approx.)—Close Down.

PRAGUE (Czechoslovakia)

Strasnice. 617 kc/s (487 m.); 5 kw.
 Transmits at intervals from 10.15 a.m.
 6.0 p.m.—Time and News.
 6.5 p.m.—Banjo and Mandoline Recital.
 7.0 p.m.—Literary Programme.
 9.0.—Time, News, Sports Notes and Gramophone Records.
 9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

ROME (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw.
 Transmits at intervals from 12 noon.
 7.30 p.m.—News, Weather, Wireless Notes and Time Signal.
 8.2 p.m.—Relay of an Opera from a Theatre or Concert from the Studio.
 In the Intervals, Talks: (a)

Hygiene, (b) The Theatre, and News Bulletin.

STOCKHOLM (Sweden)

Radiotjänst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 5.30 p.m.—Concert of Light Music.
 6.10 p.m.—Agricultural Talk.
 6.30 p.m.—German Language Lesson, from Göteborg.
 7.0 p.m.—Reading of Poems.
 7.15 p.m.—Concert of Choral, Baritone and Violin Music, with Organ Solos, relayed from the St. Clara Church.
 8.15 p.m.—News and Weather.
 8.40 p.m.—(from Uppsala, 662 kc/s (453 m.)). The Wilds of Squaw America.
 9.10 p.m.—Concert from the Works of Rubinstein, on the occasion of the Centenary of his Birth. String Quartet in C Minor Op. 17, No. 2. Pianoforte Solos; (a) Etude in C Major, Op. 23, (b) Gavotte from the Suite Op. 38, (c) Barcarolle in F Minor, Op. 30, (d) Valse Caprice.
 10.0 (approx.)—Close Down.

STUTTGART (Germany)

Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by Freiburg, 527 kc/s (570 m.).
 Transmits at intervals from 9.0 a.m.
 3.0 p.m.—Programme from Frankfurt.
 4.45 p.m.—Time, Weather and Agricultural Report.
 5.0 p.m.—Talk: From a Lost World.
 5.30 p.m.—Medical Talk: Pain.
 6.0 p.m.—Talk: For and against Capital Punishment.
 6.30 p.m.—Rubinstein Centenary Concert.
 7.0 p.m.—Soloist Concert, relayed from the Liederhalle. Symphony No. 8 in B Minor—the Unfinished Symphony (Schubert). Violin Concerto in E Minor, Op. 64 (Mendelssohn). Bass Solos: (a) Aria from "The Barber of Seville" (Rossini), (b) Aria from "Prince Igor" (Borodine). Suite from "The Fire Bird" (Stravinsky).
 9.0 p.m.—Variety Programme of Film Music and Anecdotes.

10.0 p.m.—News Bulletin.
 10.15 p.m.—(from Freiburg). Pianola Recital from the Works of Famous Composers—d'Albert, Grieg, de Falla, Debussy, Glazounoff, Max Reges and Paderewsky.

TURIN (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 1,030 kc/s (291 m.); 7 kw.
 Transmits at intervals from 7.15 a.m.
 7.0 p.m.—English Language Lesson.
 7.30 p.m.—Time Signal.
 7.32 p.m.—Literary Review and Relay of a Comedy, followed by Concert from Milan.
 11.0 p.m. (approx.)—Close down.

VIENNA (Austria)

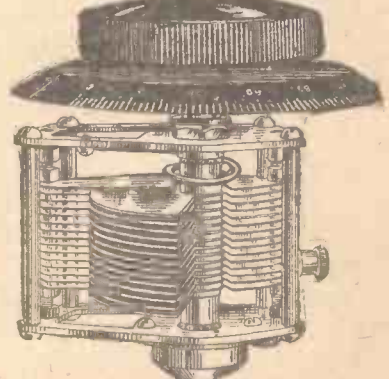
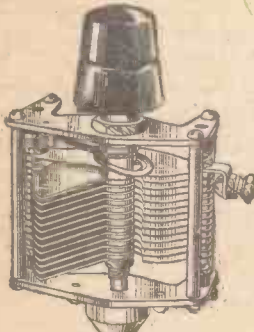
Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 10.0 a.m.
 5.30 p.m.—Talk arranged by the Board of Trade: Opportunities for the Austrian Business Man in Brazil.
 6.0 p.m.—Talk: The History of the Viennese Theatre.
 6.30 p.m.—English Language Lesson.
 7.0 p.m.—Time and Weather.
 7.5 p.m.—"Sister Henrietta"—Wireless Play (Hermann Kesser).
 8.5 p.m.—"Frauenliebe und-leben"—Song Cycle (Schumann), followed by Orchestral Concert. Photography Transmission after the Concert.

WARSAW (Poland)

Polskie Radio. 212 kc/s (1,411 m.). 8 kw.
 Transmits at intervals from 10.58 a.m.
 7.0 p.m.—Programme Announcements.
 7.5 p.m.—Musical Competition by Contributors to the Periodical "Music"—Pianoforte and Song Recital with Introductory Talk by the Editor, Mr. M. Gliniski.
 8.0 p.m.—Talk: The Streets of Warsaw in 1830.
 8.15 p.m.—"Warsawianka"—Sketch (Wyspiansky).
 9.0 p.m.—Weather, Police and Sports Notes.
 9.25 p.m.—Talk and News.
 10.0 p.m.—Dance Music, relayed from the Oaza Restaurant.
 11.0 p.m. (approx.)—Close Down.

POLAR FAST AND SLOW MOTION

for Tuning and Reaction



You will find a wonderful difference in the way you can pull in stations which are separated by only a metre or two, when you employ "Polar" Fast and Slow motion condensers.

Polar Condensers make just that difference in selectivity that adds a few more stations to your list of those "worth hearing"; and they also improve the quality of reception by giving you "dead on" tuning.

FOR REACTION
 Place the Polar "Q.J." behind your panel.

FOR TUNING
 Place the Polar "IDEAL" behind your panel.

Obtainable from all dealers.

POLAR Q.J.

.00025	- -	10/6
.00015	- -	10/3
.0001	- -	10/-

POLAR "IDEAL"

.0005	- -	12/6
.00035	- -	12/3
.0003	- -	12/-

Supplied with Knob and Dial to match the "Ideal," if desired. No extra cost.

The Polar "Ideal" DRUM CONTROL CONDENSER is supplied in capacities as above, and costs only 2/6 extra. Ask your dealer to show you one.

WINGROVE & ROGERS LTD.
 188-189, STRAND, LONDON, W.C.2

Polar Catalogue Free on Request.

PROGRAMMES FOR FRIDAY (November 29)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain)

Radio-Barcelona (EAJ1). 860 kc/s (349 m.); 8 kw.
Transmits at intervals from 11.0 a.m.
8.30 p.m.—Elementary French Lesson.
9.0 p.m.—Chimes, Weather, Exchange Quotations and News.
9.5 p.m.—Orchestral Selections. Overture, "William Tell" (Rossini).
Selection from "Marxha" (Vives).
9.35 p.m.—Song Recital.
10.0 p.m.—News Bulletin.
10.5 p.m.—"La cruz de Pepita"—Comedy in Three Acts (Carlos Arniches), followed by Exhibition Notes.
11.30 p.m. (approx.)—Close Down.

BELGRADE (Yugoslavia)

609 kc/s (429 m.); 2.5 kw.
Transmits at intervals from 10.30 a.m.
4.30 p.m.—Talk: Village Sanitation.
5.0 p.m.—Concert from the Moskva Café.
6.20 p.m.—German Language Lesson.
6.50 p.m.—Introductory Talk on the following Transmission.
7.0 p.m.—Relay of an Opera from the National Theatre.
8.30 p.m.—(In the interval) Time and News.

BERGEN (Norway)

Kringkastingskap. 824 kc/s (364 m.); 1 kw.
Transmits at intervals from 11.0 a.m.
6.30 p.m.—Orchestral Selection.
6.50 p.m.—Talk in English by Mr. F. L. M. Somerville.
7.20 p.m.—The Station Orchestra.
7.45 p.m.—Talk by Mr. Gunnar Greve.
8.15 p.m.—Pianoforte Recital.
8.45 p.m.—Topical Talk.
9.0 p.m.—Weather; News; Time.
9.30 p.m.—Relay of Foreign Stations.
11.0 p.m. (approx.)—Close Down.

BERLIN (Germany)

Königswusterhausen. 183 kc/s (1,635 m.); 26 kw.
Transmits at intervals from 5.55 a.m.
3.30 p.m.—Programme from Leipzig.
4.30 p.m.—Talk on Music.
5.0 p.m.—Talk: The International Circulation of Gold.
5.30 p.m.—Advanced English Lesson.
5.55 p.m.—Talk: The Textile Industry—Spinning.
6.25 p.m.—Programme relayed from Berlin (Witzleben).

BERLIN (Germany)

Witzleben. 716 kc/s (418 m.); 1.5 kw.
Transmits at intervals from 5.55 a.m.
4.35 p.m.—Quintet Concert.
6.5 p.m.—Talk: The Lawyer in his Office Hours.
6.25 p.m.—Introductory Talk to the following Transmission.
6.30 p.m.—"Samson and Delilah"—Opera in Three Acts (Saint-Saëns) from the Municipal Opera House, Charlottenburg. In an interval: Time, Weather, News, Sports Notes and Picture Transmission. After the Programme: Wind-Instrument Concert. Overture "Light Cavalry" (Suppé). Valse lente from "Coppélia" (Delibes). Torch Dance from "Feramors" (Rubinstein). Parade march der langen Kerle (Roland). Spanish Dances Nos. 2 and 5 (Moszkovsky). Wird der Frühling wieder kommen (Theiss). Waltz, Sirenenzauber (Waldteufel). Florentine March (Fucik). O schöne Zeit, o selige Zeit (Götze). Husarenritt (Spindler). Idyll, Am Mühlbach (Eilenberg). Prelude, Chorus and Dance from "Das Pensionat" (Suppé). Potpourri, Der musikalische Wettkampf (Chelard). Bavarian March Past.

BERNE (Switzerland)

Radio-Berne. 743 kc/s (403 m.); 1 kw.
Transmits at intervals from 11.43 a.m.
6.28 p.m.—Time and Weather.
6.30 p.m.—Talk in French: The Feminist Question in France.
7.0 p.m.—Programme of Light Music.
7.30 p.m.—"Odysseus and the Sirens"—Play (Schmidt), with Music by Hans Visscher van Gaasbeek, relayed from Basle, 297 kc/s (1,010 m.).
8.30 p.m.—Orchestral Music from the Kursaal Schänzli.
9.0 p.m.—News, Weather and Close Down.
BRATISLAVA (Czechoslovakia)
1,076 kc/s (279 m.); 12.5 kw.
Transmits at intervals from 10.30 a.m.

6.0 p.m.—Programme from Brno (See Prague).
9.0 p.m.—Programme from Prague.
9.55 p.m.—Programme Announcements and News.

BRESLAU (Germany)

923 kc/s (325 m.); 2 kw. Relay by Gleiwitz, 1,184 kc/s (253 m.).
Transmits at intervals from 10.15 a.m.
6.10 p.m.—Concert of Light Music.
6.55 p.m.—Weather and Talk: The Construction of the Universe.
7.15 p.m.—Orchestral Concert. Romantic Overture (Wünschmann). Serenade (Beischmidt). Little Suite (Ambrosius). Three Pieces for Orchestra (Blumer). Rondo Burlesk (Striegler).
8.40 p.m.—"Africa speaks..." by Dr. Erich Drach.
9.10 p.m.—News Bulletin.
9.35 p.m.—Shorthand Lesson.

BRUSSELS (Belgium)

Radio-Belgique. 590 kc/s (508.5 m.); 1 kw.
5.0 p.m.—Concert of Chamber Music.
6.0 p.m.—Talk in Flemish.
6.15 p.m.—Talk: An Engineer in the Congo.
6.30 p.m.—Gramophone Concert.
7.30 p.m.—Le Journal Parlé.
8.15 p.m.—Orchestral Concert. March, Perinette (Strauven). Selections (de Tave): (a) Chez le grand courturier, (b) En prise directe, (c) Fête des accordailles. Valse des Sirènes (D'Ambrosio). Petite Suite for Cello (Gilson). Selection from "Le Petit Faust" (Hervé). Arabella (Hamy). Selection from "Lakmé" (Delibes). In the interval at 9.0 p.m.—Topical Talk.
9.15 p.m.—Walloon Programme.
10.15 p.m.—News Bulletin.

BUDAPEST (Hungary)

545 kc/s (550 m.); 20 kw.
Transmits at intervals from 8.15 a.m.
4.40 p.m.—Military Band Concert.
5.50 p.m.—French Language Lesson.
6.30 p.m.—Programme relayed from the Royal Hungarian Opera House.
9.30 p.m. (approx.)—Time, Weather, and Tzigane Concert from the Hotel Britannia.

COLOGNE (Germany)

Westdeutscher Rundfunk. 1,319 kc/s (227 m.); 2 kw.
See Langenberg Programme.

COPENHAGEN (Denmark)

1,067 kc/s (281 m.); 0.75 kw. Relay by Kalundborg, 260 kc/s (1,153 m.).
Transmits at intervals from 6.30 a.m.
5.50 p.m.—Meteorological Report.
6.0 p.m.—News Bulletin.
6.15 p.m.—Time Signal.
6.16 p.m.—Talk relayed from the University: The Classifications of Society.
7.0 p.m.—Town Hall Chimes.
7.2 p.m.—Mozart Recital. Symphony No. 3 in E Flat Major "Bastien and Bastienne"—Musical Play in One Act.
8.10 p.m.—Reading from a Novel (Wulff).
8.35 p.m.—Recital of Modern Danish Music. Prelude and Pastoral for Oboe and Pianoforte (Andersen). Pianoforte Solos: (a) Lento, (b) Burla (Risager). Serenade for Oboe and Pianoforte, En Sommeraften (Agersnap). News after the Programme.
9.15 p.m.—Concert of Finnish Folk Music.
10.0 p.m. (approx.)—Close Down.

CORK (Ireland)

(6CK). 1,337 kc/s (225 m.); 1 kw.
1.30 p.m.—Weather Forecast and Gramophone Selections.
6.0 p.m.—Exchange, News Bulletin and Gramophone Records.
6.15 p.m.—Programme from Dublin.
CRACOW (Poland)
Polskie Radio. 959 kc/s (313 m.); 0.5 kw.
Transmits at intervals from 10.58 a.m.
6.10 p.m.—Agricultural Report.
6.25 p.m.—Answers to Correspondents.
6.58 p.m.—Time Signal.
7.0 p.m.—Church Chimes.
7.5 p.m.—Programme from Warsaw, followed by Relay of Foreign Stations.
11.0 p.m.—Chimes and Close Down.

DUBLIN (Ireland)

(2RN). 725 kc/s (413 m.); 1 kw.
1.30 p.m.—Time, Weather, Exchange and Gramophone Selections.
6.0 p.m.—Gramophone Records.
6.15 p.m.—Programme for Children.
7.0 p.m.—Gramophone Selections.
7.20 p.m.—News Bulletin.
7.30 p.m.—Time: Gardening Talk.
8.0 p.m.—The Rev. A. H. Macpherson: Scottish Humorous Readings.

8.15 p.m.—"La Bohème"—Opera (Puccini), by the Station Orchestra, the Station Opera Chorus and Soloists.
10.30 p.m.—Time, News, Weather Report and Close Down.

FRANKFURT-am-MAIN (Germany)

770 kc/s (390 m.); 1.5 kw. Relay by Cassel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.30 a.m.
3.0 p.m.—Programme from Stuttgart.
5.0 p.m.—Talk: Science and Technology.
5.20 p.m.—Weekly Film Review.
5.30 p.m.—Shorthand Speed Dictation.
5.45 p.m.—Talk for Chess-Players.
6.5 p.m.—Talk in connection with the Austro-German Workers' Week: Homeland and Nationality.
6.25 p.m.—Talk: Christmas Presents—the Microphone in Warehouses and Shops.
7.0 p.m. (from Cassel)—Concert. Four Sacred Songs for Mixed Choir, to Poems by Eichendorff (Wolf): (a) Ausblick, (b) Anklang, (c) Letzte Bitte, (d) Ergebung. Women's Choir: Jungborn—Song Cycle in the German Style to Words by E. A. Hermann (Lendvai). Tzigane Song for Mixed Choir with Pianoforte accompaniment (Brahms).
8.0 p.m.—A Literary Programme showing Different Aspects of Berlin.
8.45 p.m. (from Cassel)—Orchestral Concert.

HAMBURG (Germany)

Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relay by Bremen, 941 kc/s (319 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.).
Transmits at intervals from 5.20 a.m.
4.35 p.m.—Talk on the 6.55 p.m. Transmission.
4.55 p.m.—Variety Concert.
6.0 p.m.—Talk: The National School as a Social Centre.
6.25 p.m. (from Hanover)—Talk: Boots and Shoes.
6.45 p.m.—Exchange, Market Prices.
6.50 p.m.—Weather Report.
6.55 p.m. (from Hanover)—"Il Seraglio"—Opéra-comique in Three Acts (Mozart), relayed from the Landestheater, Brunswick.
9.40 p.m.—Talks, News, Weather, Sports and Miscellaneous Notes.
10.0 p.m.—Social Evening, with the collaboration of the Scarpa Orchestra.

HILVERSUM (Holland)

1,004 kc/s (298 m.). After 5.40 p.m., 280 kc/s (1,071 m.); 6.5 kw.
9.40 a.m.—11.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.).
9.40 a.m.—Time and Daily Service.
11.40 a.m.—Police Announcements.
11.55 a.m.—Quartet Concert.
1.40 p.m.—Talk for Schools.
2.25 p.m.—Gramophone Records.
2.40 p.m.—Talk (to be announced).
3.40—4.10 p.m.—Interval.
4.10 p.m.—Talk (to be announced).
4.40 p.m.—Gramophone Records.
5.10 p.m.—Concert by a Hungarian Tzigane Orchestra.
5.40 p.m.—Time Signal.
5.41 p.m.—Concert (continued).
6.10 p.m.—Exchange Quotations.
6.25 p.m.—Spanish Language Lesson.
6.55 p.m.—Talk (to be announced).
7.25 p.m.—Police Announcements.
7.40 p.m.—Time Signal.
7.41 p.m.—Orchestral Concert with Songs by Os-Ke-Non-Ton, the Mohawk Singer. Overture, "The Well of Love" (Balfe). Indian Love Lyrics (Amy Woodforde-Finden): (a) Kashmiri Love Song, (b) Till I wake. Songs: (a) The Coming of Montezuma (Troyer), (b) Peyote Drinking Song (Grunn), (c) The Sun Dance (Grunn). Suite from "Hiawatha" (Coleridge-Taylor): (a) The Wooing, (b) The Marriage Feast, (c) Bird Scene and Conjuror's Dance, (d) Departure. Songs: (a) Invocation to the Sun God (Troyer), (b) Hunting Song (Troyer), (c) Lo of the Mountain (Rouse). Jungle Drums (Keteley). Selection from "Rose Marie" (Friml). On the Swance River (Myddleton).
9.10 p.m.—Reading by Kommer Kleyn.
9.40 p.m.—Weather and News.
9.50 p.m.—Concert from the Works of Puccini. Selection from "Manon Lescaut." Selections from "La Bohème" and "Madame Butterfly," followed by Gramophone Records.
11.40 p.m. (approx.)—Close Down.

HUIZEN (Holland)

160 kc/s (1,875 m.); 6.5 kw.
10.10—10.40 a.m.—Programme of the Christian Radio Society (N.C.R.V.). Programme for Hospitals.
10.40—11.10 a.m.—Interval.
11.10 a.m.—2.40 p.m.—Programme of the Catholic Radio Society (K.R.O.).
11.10 a.m.—Religious Programme.
11.40—11.55 a.m.—Interval.
11.55 a.m.—Trio Concert.
12.55 p.m.—Gramophone Records.
2.10 p.m.—Programme for Schools.
3.40—6.10 p.m.—N.C.R.V. Programme.
3.40 p.m.—Gramophone Records.
4.40 p.m.—Vocal and Instrumental Concert.
6.10—6.40 p.m.—Interval.
6.40 p.m.—K.R.O. Programme. Lesson in Writing.

KALUNDBORG (Denmark)

Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw.
See Copenhagen Programme.

KATOWICE (Poland)

Polskie Radio. 734 kc/s (408.7 m.); 10 kw.
Transmits at intervals from 10.58 a.m.
6.58 p.m.—Time and Sports Notes.
7.5 p.m.—Talk on Music.
7.15 p.m.—Symphony Concert relayed from the Philharmonic. After the Concert, Weather, Press Review, Programme Announcements in French, and News.
10.0 p.m.—Answers to Correspondents—in French, for Foreign Listeners.

KÖNIGSBERG (Germany)

Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relay by Danzig, 662 kc/s (453 m.).
Transmits at intervals from 5.30 a.m.
5.45 p.m.—Talk: Traffic Regulations and Street Discipline.
6.15 p.m.—Topical Talk.
6.30 p.m.—(from Danzig), Elementary French Lesson.
6.55 p.m.—Weather Report.
7.0 p.m.—"The Execution"—A Drama (Johansen).
8.0 p.m.—Concert of Old Music. The Brandenburg Concerto in D Major for Cembalo, Violin, Flute and Strings (Bach). Partita in E Major for Cembalo (Bach). Three Italian Canzonette for Soprano with Cembalo Accompaniment: (a) Or chi non seguio mio (Rontani), (b) Chi vuole innamorarsi (Searlatti), (c) Quanto è folle quell'amante (Pasquini).
9.10 p.m.—Weather, News and Sports Notes.
9.30 p.m.—Dance Music Programme.
10.30 p.m. (approx.)—Close Down.

LAHTI (Finland)

167 kc/s (1,800 m.); 40 kw. Relay by Helsingfors, 1,357 kc/s (221 m.).
Transmits at intervals from 10.0 a.m.
4.0 p.m.—Popular Music. Overture, "Die Felsenmühle" (Reissiger). Melodies from "Le Tribut de Zamora" (Gounod).
4.30 p.m.—Fairy-Tale Reading (Andersen).
4.59 p.m.—Time and Weather.
5.10 p.m.—News Bulletin.
5.15 p.m.—Violin Recital.
5.35 p.m.—Agricultural Talk.
6.0 p.m.—Choral Concert relayed from the University.
7.45 p.m.—News in Finnish.
8.0 p.m.—News in Swedish.

LANGENBERG (Germany)

Westdeutscher Rundfunk. 635 kc/s (473 m.); 13 kw. Relay by Aix-la-Chapelle, 662 kc/s (453 m.); Cologne, 1,310 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.).
Transmits at intervals from 5.45 a.m.
4.30 p.m.—Gramophone Concert of Chamber Music.
5.30 p.m.—Talk: The Preservation of the Countryside.
5.50 p.m.—Talk: Current Events.
6.0 p.m.—Report on Economic, Weather and Sports Notes.
6.15 p.m.—English Conversation.
6.40 p.m.—Philosophical Talk: Phenomenology.
7.0 p.m.—"Salome"—Musical Drama in One Act after Oscar Wilde. Music by Richard Strauss. German Translation by Hedwig Lachmann, relayed from the Opera House, Cologne. Programme to be relayed by 5GB Daventry Experimental.
9.30 p.m.—Relay of the Cologne Six Days' Racing from the Rheinlandhalle, followed by News, Commercial Announcements, Concert and Dance Music.
11.0 p.m. (approx.)—Close Down.
LEIPZIG (Germany)
Mitteldeutscher Rundfunk. 1,157

kc/s (259 m.); 1.5 kw. Relay by Dresden, 941 kc/s (319 m.).

Transmits at intervals from 9.0 a.m.
3.30 p.m.—Chamber Music in the 19th Century. Duet for Flute and Piano No. 2 (Kuhlau). Piano Solo: Invention in F Major, Op. 29 (Meinardus). Duets: (a) Die stille Wasserrose, (b) Surre, surre Käferlein (Abt). Duet for Flute and Piano No. 2, Second Movement (Kuhlau). Vocal Duets: (a) Die Rheinischen Schiffsleute, (b) Am See, (c) Mausfallen Sprüchlein (von Holstein). Piano Solos: (a) Minuetto grazioso, (b) Elfen-tanz, Op. 71 (Brambach). Vocal Duets: (a) Abschied der Vögel and (b) Wer lehre euch singen (Hildach). Piano Solo: (a) Albumblätter, Op. 20, Nos. 5 and 6 (Scholtz). Duet for Flute and Piano No. 2, Third Movement (Kuhlau).
4.30 p.m.—Books for Women.
4.55 p.m.—Economic Report.
5.5 p.m.—Talk in Esperanto.
5.20 p.m.—Weather and Time.
5.30 p.m.—See Königswusterhausen.
5.55 p.m.—Labour Intelligence.
6.0 p.m.—Talk: Interviews with Puccini.
6.30 p.m.—Popular Concert.
7.30 p.m.—A Humorous Hour with Gustav Jacoby.
8.30 p.m.—Talk on Goethe.
9.0 p.m.—Time, Weather Report, News and Sports Notes, followed by Dance Music.
11.0 p.m. (approx.)—Close Down.

LJUBLJANA (Yugoslavia)

Radio-Ljubljana. 530 kc/s (566 m.); 2.5 kw.
Transmits at intervals from 11.30 a.m.
6.0 p.m.—Programme for Women.
6.30 p.m.—Italian Language Lesson.
9.0 p.m.—Songs by Children's Choir.
9.0 p.m.—Time, News Bulletin and Programme Announcements.

MADRID (Spain)

Union Radio (EAJ7). 707 kc/s (424 m.); 2 kw.
Transmits at intervals from 11.45 a.m.
7.0 p.m.—Chimes, Exchange Quotations and Dance Music.
8.25 p.m.—News and Station Notes.
8.30—10.0 p.m.—No Transmission.
10.0 p.m.—Chimes, Time Signal, Exchange and Symphony Concert. Overture, Fingal's Cave (Mendelssohn). Prelude in E Flat Minor (Bach). Chant hindou from "Sadko" (Rimsky-Korsakoff). La alborada del gracioso (Ravel). Second Symphony in D Major (Beethoven). Le fontane di Roma (Respighi). Bacchanal from "Tannhäuser" (Wagner).
12 midnight.—Chimes, News and Dance Music from the Palacio de Bellas Artes.
12.30 a.m. (Saturday)—Close Down.

MILAN (Italy)

Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 7 kw.
Transmits at intervals from 7.15 a.m.
7.30 p.m.—Time Signal.
7.32 p.m.—Symphony Concert. Overture, "The Peasant of the Minute" (Bartók). Suite from "The Snow Maiden" (Rimsky-Korsakoff). The First Concerto in A Minor, Op. 33 for Cello and Orchestra (Saint-Saëns). Two Songs with Orchestral accompaniment (Wagner). Symphonic Poem, Gethsemani (Da Sabata). Selection from "The Thieving Magpie" (Rossini). In the intervals, Sports Notes and Talk: From Near and Far.
10.15 p.m.—Concert. In the interval at 10.30 p.m.—Wireless News.
11.0 p.m. (approx.)—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia)

1,139 kc/s (263 m.); 10 kw.
Transmits at intervals from 10.30 a.m.
6.0 p.m.—Programme from Brno (see Prague).
9.0 p.m.—Programme from Prague.
9.55 p.m.—Programme and Miscellaneous Notices; Theatre Review.

MOTALA (Sweden)

223 kc/s (1,345 m.); 30 kw.
See Stockholm Programme.

MUNICH (Germany)

563 kc/s (533 m.); 1.5 kw. Relay by Augsburg, 536 kc/s (560 m.); Kaiseislaute, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.).
Transmits at intervals from 5.45 a.m.
5.45 p.m.—Talk: The Language of the Landscape.
6.0 p.m.—Review of Legal Affairs.
6.30 p.m.—Orchestral Concert. Ballet Suite arranged by Felix Mottl (Gluck). Aria from "Il re pastore," with Violin obbligato (Mozart).

Programmes for Friday—(Cont.)

Concerto for 'Cello and Orchestra (Haydn). "Liebelei"—Play in Three Acts (Schnitzler).
 9.5 p.m.—Sports Review.
 9.20 p.m.—News Bulletin.

OSLO (Norway)

Kringkastingsselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by Fredrikstad, 761 kc/s (394 m.); Hamar, 527 kc/s (570 m.); Notodden, 1,058 kc/s (283 m.); Porsgrund, 662 kc/s (453 m.).
 Transmits at intervals from 9.0 a.m.
 6.15 p.m.—Weather and News.
 6.30 p.m.—Elementary English Lesson.
 7.0 p.m.—Time Signal.
 7.2 p.m.—Symphony Concert from the Logen Hall.
 8.30 p.m.—Weather and News.
 8.50 p.m.—Topical Talk.
 9.5 p.m.—Literary Review.
 10.15 p.m.—Gramophone Records.—Close Down.

PARIS (France)

Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
 Transmits at intervals from 8.0 a.m.
 6.30 a.m.—Radio-Journal de France.
 8.0 p.m.—Spanish Lesson, arranged by the Berlitz School.
 8.30 p.m.—Talk arranged by the Union des Grandes Associations.
 8.45 p.m.—Concert, followed by News, Time and Weather and Symphony Concert relayed from the "Prado."

PARIS (France)

Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.
 7.56 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
 9.26 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
 5.45 p.m.—Le Journal Parlé.
 7.10 p.m.—Meteorological Forecast.
 7.20 p.m.—Concert. At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
 10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)

Petit Parisien. 914 kc/s (329 m.); 0.5 kw.
 6.45 p.m.—Transmission of Pictures.
 7.25 p.m.—Gramophone Records.
 8.0-9.0 p.m.—Dance Music.

PARIS (France)

Radio-Paris (CFR). 174 kc/s (1,725 m.) 12 kw.
 Transmits at intervals from 6.45 a.m.
 12.30 p.m.—Gramophone Concert.
 In the interval at 1.0 p.m.—Exchange Quotations and News.
 2.0 p.m.—Exchange; Market Prices.
 3.30 p.m.—Exchange Quotations.
 3.45 p.m.—Concert. Orchestral Selection: Madriléna (Infante). Sonata for Violin (Bach-Tourneure). Orchestral Selection: Berceuse (Gaubert). Esquisses, for Piano (Défosse). Orchestral Selection: Chanson d'autrefois (Pierné). Sonata for 'Cello & (Saint-Saëns). Orchestral Selection from "Grisélidis" (Massenet-Tavan).

4.55 p.m.—News and Exchange.
 6.0 p.m.—Agricultural Report and Racing Results.
 6.30 p.m.—New York Exchange Rates.

PARIS (France)

6.35 p.m.—Gramophone Concert.
 7.50 p.m.—Talk by M. René Bizet.
 7.30 p.m.—Advanced English Lesson.
 7.45 p.m.—Market Prices, Economic and Social Review, News and Amusement Guide.
 8.0 p.m.—Talk: Franz Schubert, with Gramophone Illustrations.
 8.30 p.m.—American Closing Prices and Sports Notes.
 8.45 p.m.—Concert arranged by Philips Radio. "Lakmé"—Opera (Delibes). In the interval at 9.15 p.m.—Press Review and Time Signal.

PITTSBURGH (U.S.A.)

Westinghouse Electric (KDKA). 980 kc/s (306 m.); 25 kw.
 Transmits at intervals from 1.30 p.m.
 11.30 p.m.—Studio Programme.
 11.59 p.m.—Chimes and Henkel's Harmonizers.
 12.30-4.0 a.m. (Saturday).—New York Relay.
 4.0 a.m.—Pepsodent Amos and Andy.
 4.15 a.m.—Longines Time from New York.
 4.16 a.m.—Don Bestor's Recording Orchestra.
 4.45 a.m.—Champion Weather Report.

POSEN (Poland)

896 kc/s (335 m.); 1.2 kw.
 Transmits at intervals from 12.0 noon.
 7.15 p.m.—Programme from Warsaw.

In the intervals, Theatre and Station Notes.
 9.0 p.m.—Time, Sports Notes and News Bulletin.
 9.15 p.m.—Transmission of Pictures.
 9.45 p.m.—Dancing Lesson.
 10.10 p.m.—Dance Music, relayed from the Café Esplanade.
 11.0 p.m.—Close Down.

PRAGUE (Czechoslovakia)

Stranice. 617 kc/s (487 m.); 5 kw.
 Transmits at intervals from 10.15 a.m.
 6.0 p.m.—Programme from Brno, 878 kc/s (342 m.). Opera by Kricka, with Short Introductory Talk, relayed from the National Theatre, Brno.
 9.0 p.m.—Time and News.
 9.15 p.m.—Concert from the Café Prague.
 9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.

ROME (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.) 2.4 kw.
 Transmits at intervals from 12 noon.
 7.30 p.m.—News, Weather Notes and Time Signal.
 8.2 p.m.—Programme in Commemoration of the Fifth Anniversary of the Death of Puccini. "Turandot"—Opera in Three Acts (Puccini). In the intervals, Il Radio Travaso, Topical Review and News Bulletin.

STOCKHOLM (Sweden)

Radiojäst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
 Transmits at intervals from 6.15 a.m.
 5.30 p.m.—Cabaret Programme.
 6.30 p.m.—Talk: The Teutons.
 7.0 p.m.—Concert of Danish Music. Symphony No. 4 in B flat major, Op. 20 (Gade). Romance for Violin and Orchestra in G major, Op. 63 (Lange-Müller). Overture, "Aladdin" (Hornemann). En Sagårdöm, Op. 39, and Prelude to the Second Act of "Saul and David" (Nielsen). Romance for Violin and Orchestra in C Major, Op. 23 (Tofft). Selections from "Lackschmi" (Nielsen).

8.15 p.m.—News and Weather.
 8.40 p.m.—French Language Lesson, from Malmo, 1,301 kc/s (231 m.).
 9.10 p.m.—Dance Music Programme.
 10.0 p.m. (approx.)—Close Down.
 6.0 p.m.—Programme from Brno (See Prague).
 9.0 p.m.—Programme from Prague.
 9.0 p.m.—Programme and Miscellaneous Notices; Theatre Review.

STUTTGART (Germany)

Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by Freiburg, 527 kc/s (570 m.).
 Transmits at intervals from 9.0 a.m.
 3.0 p.m.—Orchestral Concert. Selections (Wagner): (a) Prelude to "Lohengrin," (b) Ein Albulblatt, (c) Siegfried Idyll, (d) Baritone Solo: Aria from "The Mastersingers," (e) Entry of the Gods into Valhalla from "The Ringgold." Overture, "The Merry Wives of Windsor" (Nicolai). Minuet in E Flat Major (Haydn). Baritone Solos: (a) Champagne Aria from "Don Juan" (Mozart), (b) Aria from "L'Africaine" (Meyerbeer). Folk Scene from "The Evangelist" (Kienzl). Selection from "Ariadne on Naxos" (R. Strauss). Prelude to the Fourth Act of "Carmen" (Bizet). Coronation March from "The Prophet" (Meyerbeer).
 4.45 p.m.—Time, Weather and Agricultural Report.
 5.0 p.m.—(from Freiburg). Talk: The Welfare Work of the League of Nations.
 5.30 p.m.—(from Mannheim). Professional Work in a Woman's Life.
 6.0 p.m.—Talk: German Agriculture and its Position with regard to Political Economy as a whole.
 6.30 p.m.—Orchestral Concert. Overture, "La Belle Hélène" (Offenbach). A Wedding Day on Troldhaugen (Grieg). Kriegerabenteurer-Polka (J. Strauss).
 7.0 p.m.—See Frankfurt Programme.
 9.30 p.m. (approx.)—News, Sports Announcements and Talk on the Week's Weather with Forecast for the Week-end.

TURIN (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 1,030 kc/s (291 m.); 7 kw.
 Transmits at intervals from 7.15 a.m.
 7.0 p.m.—German Language Lesson.

7.30 p.m.—Time Signal.
 7.32 p.m.—Programme from Milan.
 10.0 p.m.—Dance Music from the Caffè Alfieri. In the interval at 10.30 p.m.—Wireless News.
 11.0 p.m. (approx.)—Close Down.

VIENNA (Austria)

Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
 Transmits at intervals from 10.0 a.m.
 3.30 p.m.—Songs and Pianoforte Recital from the Works of Anton Rubinstein on the Centenary of his Birth (November 28th, 1820). Songs: (a) Der Traum, (b) Klärchens Lied, (c) Veilchen vom Berg, (d) Selection from the Spanish Song-Book, (e) Modern Greek Song, (f) Melody. Piano Solos: (a) Scherzo in D major, Op. 109, (b) Waltz in A flat major, Op. 14, (c) Polka-Mazurka in F major, Op. 14, (d) C zardas in E major, Op. 82, (e) Rousskaia and Trepak in C major, Op. 82.
 4.45 p.m.—Weekly Sports Notes.
 5.0 p.m.—Talk: The History of Viennese Art during Seven Centuries. Art in the Time of the Emperor Franz Josef.
 5.30 p.m.—Talk: Training in Independence.
 6.0 p.m.—Talk arranged by the Board of Trade.
 6.30 p.m.—Italian Language Lesson.
 7.5 p.m.—Instrumental Selections from Opera, followed by Phototelegraphy Transmission.

WARSAW (Poland)

Polskie Radio. 212 kc/s (1,411 m.); 8 kw.
 Transmits at intervals from 10.58 a.m.
 7.0 p.m.—Programme Announcements.
 7.5 p.m.—Talk on Music.
 7.15 p.m.—Symphony Concert by the Warsaw Philharmonic Society. Symphony in D Major (Mozart). Symphonie Poem, Anelli (Rozycky). Chamber Symphony (Schönberg). Concerto for Violin (Brahms). Three Selections from "Much Ado about Nothing" (Korngold). Theatre Notes in the interval. After the Programme; News, Weather, Police and Sports Notes, Talk and Relay of Foreign Stations.

SAY GOODBYE TO BATTERIES!

Don't let batteries bother you a day longer. Say 'goodbye' to them and buy a POWQUIP H.T. Eliminator. You will then realise the advantages of continuous and unvarying voltage. The first outlay is the last. Model B (Illustrated) will give you 100 hours supply for 6d. All POWQUIP Eliminators will not and cannot hum. Other models from 50/- List on request.

POWQUIP ELIMINATORS

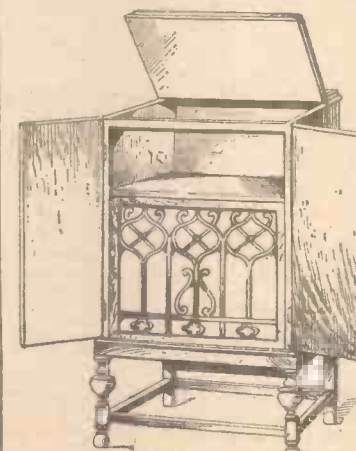
MODEL B
5GNS.

Royalty Paid Value Extra.

The "KINGSWAN 3" Receiver with Loud-speaker rivals sets costing treble. Price complete 9 gns.
 The POWER EQUIPMENT CO., LTD., Kingsbury Works, The Hyde, Hendon, N.W.9.



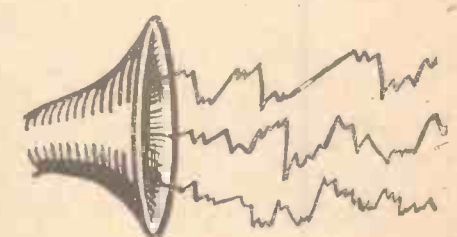
A TRIUMPH IN READY-TO-ASSEMBLE WIRELESS CABINETS



This latest Osborn production is a beautiful piece of furniture and an ideal home for your set. You can assemble it quickly and easily. 4 ft. high, 2 ft. 2 in. wide, 1 ft. 6 in. deep. Size of baffle board behind fret is 24 ins. x 24 ins. Metallic fabric for the fret front is included. This cabinet will take panel 2 ft. x 9 ins. or smaller size.
 Machined ready to assemble: Oak 60/-, Mahogany 65/-.
 Assembled ready to polish: Oak 75/-, Mahogany 80/-.
 Assembled and polished: Oak 90/-, Mahogany 95/-.
 Radio-Gramophone COMBINATION.
 For the small sum of 5/- extra this cabinet can be made 4 inches higher and converted into a Radio-Gramophone Cabinet complete with Motor Board.

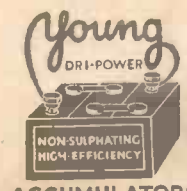
"Make Your Cabinet the OSBORN WAY."
CHAS. A. OSBORN.
 OFFICES, SHOWROOMS AND MILLS:
 The Regent Works, Arlington Street, London, N.1.
 Telephone: Clerkenwell 5095.
 Open to 7.30 p.m. Saturdays, 4.30 p.m.
 And at 21, ESSEX ROAD, ISLINGTON, N.1
 (1 minute from the Agricultural Hall). Open until 8 p.m. WEEKDAYS; 9 p.m. SATURDAYS.
 Phone: Clerkenwell 5634.

Please send me your 56p. Illustrated Catalogue for which I enclose 3d. in stamps.
 Name.....
 Address.....
 Dept. W.P.



NO CRACKLE

No falling off in voltage... no harmful sulphation... no distressing and unexpected faults and irregularities common to most other batteries and accumulators.
 A "YOUNG" 2-volt cell under fierce test kept a voltage of 2.2 during the exhaustion of more than half its capacity.
 Use "YOUNG" batteries with confidence of perfect results and long life. Guaranteed for ever against harmful sulphation.
 Radio enthusiasts who want the best should write for interesting booklet, price list and name of nearest dealer.



YOUNG ACCUMULATOR Co. (1929) Ltd.
 Dept. 13, Burlington Works, Arterial Road, New Malden, Surrey.
 Telephone: Malden 1171 (3 lines).

PROGRAMMES FOR SATURDAY

(November 30)

NOTE: THE HOURS OF TRANSMISSION ARE REDUCED TO GREENWICH MEAN TIME

BARCELONA (Spain) Radio-Barcelona (EAJ1). 860 kc/s (349 m.); 8 kw. Transmits at intervals from 11.0 a.m. 8.30 p.m.—Elementary German Lesson. 9.0 p.m.—Chimes, Weather Report, Exchange, News and Agricultural Notes. 9.10 p.m.—Orchestral Concert. March. The Soldier of Fortune (Apthorp). Selection from "El puñao de rosas" (Chapi). Waltz (J. Strauss). Entr'acte (Massenet). Pavane de Louis XV (Tavan). Overture, "The Magic Flute" (Mozart). 10.0 p.m.—News Bulletin. 10.5 p.m.—Programme from Madrid.

BELGRADE (Yugoslavia) 690 kc/s (429 m.); 2.5 kw. Transmits at intervals from 9.30 a.m. 4.30 p.m.—Orchestral Concert. 6.30 p.m.—Talk: Babylonia and European Culture. 7.0 p.m.—Vocal and Instrumental Concert. 7.55 p.m.—Tzigane Concert of Folk Melodies. 8.45 p.m.—News and Time. 9.0 p.m.—"Maksim Crnojevic"—Drama (Kostic). 9.45 p.m.—Dance Music relayed from the Belgrade Auto Club.

BERLIN (Germany) Königswusterhausen. 183 kc/s (1,635 m.); 26 kw. Transmits at intervals from 5.55 a.m. 3.30 p.m.—Programme from Hamburg. 4.30 p.m.—Talk: The Civil Servant in the Penal Code according to the Recommendations of the Penal Law Commission. 5.0 p.m.—Talk: The Artist as a Worker. 5.30 p.m.—Elementary French Lesson. 5.55 p.m.—Talk: Troubles never come singly. 6.20 p.m.—Talk: Political Wisdom. 7.0 p.m.—Concert by the Budapest String Quartet. Quartet in B flat Major Op. 76 No. 4 (Haydn). Quartet in E flat Major Op. 74 (Beethoven). 8.0 p.m.—Programme from Frankfurt. 9.30 p.m.—News, Dance Music and Picture Transmission from Berlin (Witzleben). 10.50 p.m.—See Langenberg Programme.

BERLIN (Germany) Witzleben. 716 kc/s (418 m.); 1.5 kw. Transmits at intervals from 5.55 a.m. 3.30 p.m.—Orchestral Concert. 5.30 p.m.—See Königswusterhausen. 6.0 p.m.—Talk: In a Car through Europe. 6.30 p.m.—Topical Programme. 7.0 p.m.—Cabaret Programme. 8.0 p.m.—Concert from the Works of Puccini. Selections from "Madame Butterfly," "La Bohème" and "La Tosca." 9.30 p.m.—Time, Weather, News, Sports Notes and Dance Music. Picture Transmission in the interval. 10.50 p.m.—See Langenberg Programme.

BERNE (Switzerland) Radio-Bern. 743 kc/s (403 m.); 1 kw. Transmits at intervals from 5.45 a.m. 6.28 p.m.—Time and Weather. 6.30 p.m.—Popular Programme. Talk in Berne Dialect, Jodelling Selections, Orchestral Music and Humorous Items. 8.20 p.m.—Variety Items. 9.0 p.m.—News and Weather. 9.15 p.m.—Orchestral Music. 9.40 p.m.—Dance Music Programme. 11.0 p.m. (approx.)—Close Down.

BRATISLAVA (Czechoslovakia) 1,076 kc/s (279 m.); 12.5 kw. Transmits at intervals from 10.30 a.m. 6.0 p.m.—Programme from Prague. 7.30 p.m.—(From Kosice, 1,022 kc/s, 293 m.). Recital of Popular Slovakian Songs followed by Orchestral Concert. 9.0 p.m.—Programme from Prague. 9.55 p.m.—Programme Announcements and News. 10.0 p.m.—Programme from Prague.

BRESLAU (Germany) 923 kc/s (325 m.); 2 kw. Relayed by Gleiwitz, 1,184 kc/s (253 m.).

Transmits at intervals from 10.15 a.m. 5.30 p.m.—See Königswusterhausen. 5.55 p.m.—Talk in Esperanto: "The Silesians and their Customs.—St. Andrew's Day Customs. 6.5 p.m.—Weather for Farmers. 6.7 p.m.—Talk: Folk Songs, with Gramophone Illustrations. 7.5 p.m.—Talk: Self-Administration for Agriculture. 7.30 p.m.—"Laugh and be happy with Gustav Jacoby!"—Variety Programme with the Collaboration of the Orchestra. 9.10 p.m.—News Bulletin. 9.30 p.m.—Dance Music Programme. 10.50 p.m.—See Langenberg Programme.

BRUSSELS (Belgium) Radio-Belgique. 590 kc/s (508.5 m.); 1 kw. 5.0 p.m.—Trio Concert. L'accordée de village (Steck). Selection from "Madame Roland" (Fourdrain). Piano Solo. Entr'acte and Réverie (Fourdrain). Selection from "Marouf" (Rabaud). Minuet (Boccherini). Violin Solo. Selection from "La Mascotte" (Audran). 5.45 p.m.—Elementary and Intermediate English Lessons arranged by the Berlitz School. 6.30 p.m.—Gramophone Concert. 7.30 p.m.—Le Journal Parlé. 8.15 p.m.—Concert arranged by "La Meuse." Overture, "The Barber of Seville" (Rossini). Songs from (a) "The Barber of Seville" (Rossini), (b) "Le Jongleur de Notre Dame" (Massenet). Selection from "Carmen" (Bizet). Songs from (a) "The Queen of Sheba" (Gounod), (b) "Cavalleria Rusticana" (Mascagni). Selection from "I Pagliacci" (Leoncavallo). Duet for Soprano and Baritone from "Les Dragons de Villars" (Maillart). Mascarade (Lacome). Soprano and Baritone Duet from "The Tales of Hoffmann" (Offenbach). Waltz, Les Sirènes (Waldteufel). Item in Wallon Dialect. Dance Music Selections. In the intervals, at 8.30 p.m.—Talk: "The History of Art, and at 9.0 p.m.—Topical Talk. 10.15 p.m.—Press Review and News in Esperanto.

BUDAPEST (Hungary) 545 kc/s (550 m.); 20 kw. Transmits at intervals from 8.15 a.m. 6.30 p.m.—Variety Programme. 8.30 p.m.—Time, Weather, News and Tzigane Concert from the Café Emke. 10.0 p.m.—Military Band Concert.

COLOGNE (Germany) Westdeutscher Rundfunk. 1319 kc/s (227 m.); 2 kw. See Langenberg Programme.

COPENHAGEN (Denmark) 1,067 kc/s (281 m.); 0.75 kw. Relayed by Kalundborg, 260 kc/s (1,153 m.). Transmits at intervals from 6.30 a.m. 5.50 p.m.—Meteorological Report and News. 6.15 p.m.—Time Signal. 6.16 p.m.—Talk: The Uses of Electricity in the Garden. 6.45 p.m.—Talk (to be announced). 7.15 p.m.—The History of Denmark in Literature and Music. From Christian the Second to the Reformation. Programme of Orchestral and Vocal Music, preceded by Talk. 8.30 p.m.—Saxophone Recital. 8.50 p.m.—News Bulletin. 9.5 p.m.—Two Sketches, "Masculine Sensibility in Seven Letters" (Lyngé) and "Absence of Mind" (Lyngé). 9.20 p.m.—Cello Recital. Sonata in A Minor for Cello and Piano (Schubert). Sarabande and Gigue from the Suite in E Major (Bach). Andantino (Martini). Gavotte (Lully). Toccata (Frescobaldi-Cassado).

9.50 p.m.—Dance Music from the Industri Restaurant. 11.0 p.m. (In the interval)—Town Hall Chimes. 11.15 p.m. (approx.)—Close Down.

CORK (Ireland) (6CK). 1,337 kc/s (225 m.); 1 kw. 1.30 p.m.—Weather Forecast and Gramophone Selections. 7.20 p.m.—Programme from Dublin.

CRACOW (Poland) Polskie Radio. 959 kc/s (313 m.); 0.5 kw. Transmits at intervals from 10.58 a.m. 6.10 p.m.—Agricultural Report. 6.25 p.m.—Review of Foreign Politics for the Past Week. 6.58 p.m.—Time Signal.

7.0 p.m.—Church Chimes. 7.30 p.m.—Programme from Warsaw. 11.0 p.m.—Chimes and Close Down.

DUBLIN (Ireland) (2RN). 725 kc/s (413 m.); 1 kw. 1.30 p.m.—Time, Weather Report and Gramophone Selections. 7.20 p.m.—News Bulletin. 7.30 p.m.—Time; Health Talk. 7.45 p.m.—Irish Lesson. 8.0 p.m.—Concert. The Caledonian Male Voice Choir. The Station Orchestra: Scottish Music. The Choir. Frank Fay and Company: Scenes from Shakespeare. David Legge (Tenor). The Station String Orchestra. J. O'Dea and Fay Sargent: Jack and Jill up-to-date. The Station Orchestra. 10.30 p.m.—Time Signal, News, Weather and Close Down.

FRANKFURT-am-MAIN (Germany) 770 kc/s (390 m.); 1.5 kw. Relayed by Cassel, 1,220 kc/s (246 m.). Transmits at intervals from 5.30 a.m. 3.0 p.m.—Concert relayed from Hamburg v.d. Höhe. 5.0 p.m.—Talk arranged by the Frankfurt Society for National Education. 5.30 p.m.—Talk for Workers: The Worker and Holiday Culture. 6.0 p.m.—Programme from Leipzig. 6.30 p.m.—Pianoforte Recital. Toccata (Claude Merulo, 1533-1604). Toccata (Vivaldi, 1600). John, come kiss me (William Byrd, 1538-1623). The Duchesse of Brunswick's Toy (John Bull, 1563-1623). Pavane (John Bull). Three Selections (Samuel Scheidt, 1587-1654): (a) Allemande, (b) Courante (c) Variations on the Dutch Folk Song, "Ach, du feiner Reiter." 7.0 p.m.—Programme from Stuttgart. 8.0 p.m.—"Woe to him who turns!"—Wireless Revue (Hilarius). 9.15 p.m.—Programme from Stuttgart. 10.30 p.m.—Organ Recital with Choral Selections. Toccata sexta in F Major (Muffat). German Folk Songs for Mixed Choir. Fantasia in G Major for Organ (Bach). 11.0 p.m.—Freedom Festival, relayed from Coblenz.

HAMBURG (Germany) Norag (ha, in Morse). 806 kc/s (372 m.); 1.5 kw. Relayed by Bremen, 941 kc/s (319 m.); Flensburg, 1,373 kc/s (218 m.); Hanover, 536 kc/s (560 m.); and Kiel, 1,220 kc/s (246 m.). Transmits at intervals from 5.20 a.m. 3.30 p.m.—"Der Schauspielersverein"—Opéra-Comique in One Act (Mozart), relayed from the Stadttheater. 4.30 p.m.—Tenor Song Recital from the Works of Jensen, relayed from Kiel. Serenade. Träumerei. O lass dich halten, goldne Stunde. Alt-Heidelburg, du feine. Nachmittagsstille und Abendmusik. Die Mühle. Murrelmede Lüftchen. Am Ufer des Flusses des Manzanares. Wedding Music. 5.15 p.m.—Variety Concert. 6.0 p.m.—Concert from Hanover. "Love's Joys and Sorrows." Ballade, Op. 10, No. 1 (Brahms). Songs: (a) Liebestreu wie deine Wangen (Fieditz). Hymnus (Fieditz). Songs: (a) Ja überstehst hast du mich gemacht (Eckert). (b) Sehnsucht (Hoffmann). Nocturne (Field). Songs: (a) Verborgene Liebe (Grieg). (b) Why? (Tchaikovsky). 6.55 p.m.—Weather Report. 7.0 p.m.—Variety Programme, with Instrumental Music and Cabaret Items. 9.15 p.m. (in an interval)—Talks, News, Weather, Sports and Miscellaneous Notes. 10.50 p.m.—See Langenberg Programme. 11.35 p.m. (approx.)—Close Down.

HILVERSUM (Holland) 1,004 kc/s (298 m.). After 5.40 p.m., 280 kc/s (1,071 m.); 6.5 kw. 9.40 a.m. till 7.40 p.m.—Programme of the Algemeene Vereeniging Radio Omroep (A.V.R.O.). 9.40 a.m.—Time and Daily Service. 11.40 a.m.—Police Announcements. 11.55 a.m.—Quartet Concert. 1.40 p.m.—Talk (to be announced). 2.10 p.m.—Musical Programme relayed from the Tuschinski Cinema, Amsterdam. 3.40—5.10 p.m.—Three Talks. 5.10 p.m.—German Language Lesson. 5.40 p.m.—Time Signal. 5.41 p.m.—Military Band Concert. March, L'enfant de troupe (Barbe). Hungarian Comedy Overture

(Kéler-Béla). Mon rêve (Waldteufel). Ein Waldkonzert (Eilenberg), Elfengeflüster (Rhode). Rumänische Liebesnacht (Kopping). March, Met zwaard en Land (Starke). March, Abmarsch in die Quartiere (Blankenburg). Monkey Love (Morse). Selection from "Film Magic" (Kollo). U.D.I. March (v.d. Glas). 7.25 p.m.—Police Announcements. 7.40 till Close Down.—Programme of the Workers' Radio Society (V.A.R.A.). Programme arranged by the Dutch Temperance Society with the Assistance of the V.A.R.A. Theatre under the direction of Mr. W. v. Cappellen and of the V.A.R.A. Orchestra under the Direction of Mr. Hugo de Groot. "Als de poort wordt geopend"—Tragedy in Three Acts (Rudolf Farro.) Orchestral Selections in the intervals. Gramophone Records after the Programme.

HUIZEN (Holland) 160 kc/s (1,875 m.); 6.5 kw. 11.10 a.m. till Close Down.—Programme of the Catholic Radio Society (K.R.O.). 11.10 a.m.—Sacred Recital. 11.55 a.m.—Concert of Trio Music. 12.55 p.m.—Gramophone Records. 1.40 p.m.—Programme for Children. 3.40 p.m.—Lesson in Esperanto. 4.10 p.m.—English Language Lesson. 4.40 p.m.—Gramophone Records. 5.40 p.m.—Exchange Quotations. 5.45 p.m.—Gramophone Records. 6.20 p.m.—Weekly Journalistic Review. 6.40 p.m.—Talk by Mr. v. d. Stadt. 7.10 p.m.—Talk by Mr. H. Donders. 7.41 p.m.—K.R.O. Orchestral Concert. Overture, "Si j'étais roi" (Adam). Songs: (Schubert): (a) Am Meer, (b) Ständchen, (c) Frühlingsglaube. Ballet Music from "La Gioconda" (Ponchielli). Indian Song (Dvorak). Selection from "Mignon" (Thomas). Overture, "Martha" (Flotow). 8.40 p.m.—Humorous Gramophone Records. 9.40 p.m.—Concert (continued). Vilja's Song from "The Merry Widow" (Lehár). Selection from "The Geisha" (Jones). Pizzicato-Polka (Strauss). March, King Cotton (Sousa). 10.40 p.m.—Gramophone Records. 11.40 p.m. (approx.)—Close Down.

KALUNDBORG (Denmark) Kalundborg Radio. 260 kc/s (1,153 m.); 7.5 kw. See Copenhagen Programme.

KATOWICE (Poland) Polskie Radio. 734 kc/s (408.7 m.); 10 kw. Transmits at intervals from 10.58 a.m. 6.58 p.m.—Time Signal. 7.0 p.m.—Regional Programme. 7.30 p.m.—Concert of Light Music. 9.0 p.m.—Reading. 9.15 p.m.—Weather, Programme Announcements in French and News. 9.35 p.m.—Press Review. 10.0 p.m.—Dance Music.

KÖNIGSBERG (Germany) Ostmarken Rundfunk. 1,085 kc/s (276 m.); 2.5 kw. Relayed by Danzig, 662 kc/s (453 m.). Transmits at intervals from 5.30 a.m. 5.30 p.m.—Pianoforte Quartet (Brahms), by the Lener Quartet, on Gramophone Records. 6.10 p.m.—Programme Announcements in Esperanto. 6.15 p.m.—Topical Talk. 6.45 p.m.—Wireless Technical Talk. 7.0 p.m.—Weather Report. 7.5 p.m.—Modern Military Band Music. Spiel für Blasmusik (Toch). Volga Song (Stravinsky). Variations on "Prince Eugene" (Hindemith). Military March (R. Strauss). 7.45 p.m.—Gramophone Concert from the Works of Puccini. 8.25 p.m.—(from Danzig), Recital of Berlin Songs. 9.10 p.m.—Weather, News and Sports Notes. 9.30 p.m.—Dance Music from the Central Hotel. 11.0 p.m. (approx.)—Close Down.

LAHTI (Finland) 167 kc/s (1,800 m.); 40 kw. Relayed by Helsinki, 1,357 kc/s (221 m.). Transmits at intervals from 10.0 a.m. 5.55 p.m.—Choral Concert. In the interval at 6.10 p.m.—Talk. 6.45 p.m.—Recitations. 7.5 p.m.—Recital of Songs. 7.25 p.m.—Orchestral Concert. In the intervals at 7.45 p.m.—News in Finnish, and at 8.0 p.m.—News in Swedish.

8.15 p.m.—Dance Music from the Förssi Restaurant. 10.0 p.m. (approx.)—Close Down.

LANGENBERG (Germany) Westdeutscher Rundfunk. 635 kc/s (473 m.); 13 kw. Relayed by Aix-la-Chapelle, 662 kc/s (453 m.); Cologne, 1,319 kc/s (227 m.); and Münster, 1,283 kc/s (234 m.). Transmits at intervals from 5.45 a.m. 4.30 p.m.—Mandoline Concert with Tenor Solos. 5.30 p.m.—Talk: The Establishment of a German Monopoly in Matches. 5.50 p.m.—Report of the West German Wireless Society. 6.0 p.m.—Report on Economics, Weather and Sports Notes. 6.15 p.m.—Talk: Social Insurance—Sick and Old Age Benefits, Widows and Orphans' Funds. 6.35 p.m.—Thomas Mann reads from his Unpublished Novel: "Joseph und seine Brüder." 7.0 p.m.—Variety Programme, followed by News, Sports Notes and Commercial Announcements. 9.20 p.m.—Elementary Dancing Lesson. 9.40 p.m.—Relay of the Cologne Six Days' Racing from the Rheinlandhalle. 10.0 p.m.—Gramophone Dance Music. 10.50 p.m.—Relay of the Festival Programme to commemorate the Freedom of the City of Aix-la-Chapelle, followed by "The Third Symphony"—The Heroic (Beethoven), by the Station Orchestra.

LEIPZIG (Germany) Mittelsdeutscher Rundfunk. 1,157 kc/s (259 m.); 1.5 kw. Relayed by Dresden, 941 kc/s (319 m.). Transmits at intervals from 9.0 a.m. 6.0 p.m.—Talk: Discipline and Punishment in Schools. 6.30 p.m.—Concert of Music by Leo Fall. Selections from "The Merry Peasant," "Die geschiedene Frau," "Der liebe Augustin," "The Dollar Princess," "Brüderlein fein," "Die Kaiserin," "Madame Pompadour." In the interval, Autobiographical Notes and Anecdotes from Leo Fall's Life. 7.45 p.m.—"Goethe"—Humorous Sketch (Friedel and Polgar). 8.15 p.m.—Concert of Viennese Music by Johann Strauss, relayed from the Volkshaus. 9.15 p.m.—See Berlin (Witzleben). 10.50 p.m.—See Langenberg.

LJUBLJANA (Yugoslavia) Radio-Ljubljana. 530 kc/s (566 m.); 2.5 kw. Transmits at intervals from 11.30 a.m. 5.30 p.m.—Lesson in Esperanto. 6.0 p.m.—Talk on Economics. 6.30 p.m.—German Language Lesson. 7.0 p.m.—Concert of Wind-Instrument Music. 9.0 p.m.—Time, News, Light Music. Selections, Weekly News Review and Programme Announcements.

MADRID (Spain) Union Radio (EAJ7). 707 kc/s (424 m.); 2 kw. Transmits at intervals from 11.45 a.m. 7.0 p.m.—Chimes and Dance Music. 8.25 p.m.—News and Station Notes. 8.30—10.0 p.m.—No Transmission. 10.0 p.m.—Chimes, Time Signal and Selections from a Musical Comedy. After the Programme, News Bulletin. 12.30 a.m. (Sunday)—Close Down.

MILAN (Italy) Ente Italiano Audizioni Radiofoniche. 599 kc/s (501 m.); 7 kw. Transmits at intervals from 7.15 a.m. 7.30 p.m.—Time Signal. 7.32 p.m.—Programme from Turin. 10.30 p.m.—Wireless News. 10.40 p.m.—Programme from Turin. 11.30 p.m. (approx.)—Close Down.

MORAVSKA-OSTRAVA (Czechoslovakia) 1,139 kc/s (263 m.); 10 kw. Transmits at intervals from 10.30 a.m. 6.0 p.m.—Programme from Prague. 7.30 p.m.—(From Brno, 878 kc/s, 342 m.) Talk: The Origin of the World, according to Science; followed by "The Count"—Drama (Saltén). 9.0 p.m.—Programme from Prague. 9.55 p.m.—Programme and Miscellaneous Notices; Theatre Review. 10.0 p.m.—Concert from Prague.

MOTALA (Sweden) 1 223 kc/s (1,345 m.); 30 kw. See Stockholm Programme.

Programmes for Saturday—(Cont.)

MUNICH (Germany)

5.03 kc/s (533 m.); 1.5 kw. Relayed by Augsburg, 536 kc/s (560 m.); Kaiserlautern, 1,112 kc/s (270 m.); and Nürnberg, 1,256 kc/s (239 m.). Transmits at intervals from 5.45 a.m. 6.45 p.m.—Peter Supf reads from his own works.
7.5 p.m.—Orchestral Concert, with Tenor Solos.
8.20 p.m.—Surprise Programme.
9.20 p.m.—News Bulletin.
9.45 p.m.—Quartet Music relayed from the Café Neue Börse.
10.0 p.m.—Wireless Interlude.

OSLO (Norway)

Kringkastingsselskapet. 608 kc/s (493 m.); 1.2 kw. Relayed by Fredrikstad, 761 kc/s (394 m.); Hamar, 527 kc/s (570 m.); Notodden, 1,058 kc/s (283 m.); Porsgrund, 662 kc/s (453 m.).
Transmits at intervals from 10.10 a.m. 7.0 p.m.—Time Signal.
7.2 p.m.—Orchestral Concert.
8.0 p.m.—Finnish Recitations.
8.30 p.m.—Weather and News.
8.50 p.m.—Topical Talk.
9.5 p.m.—Cabaret Programme.
10.0 p.m.—Gramophone Dance Records.
11.0 p.m. (approx.)—Close Down.

PARIS (France)

Ecole Supérieure (FPTT). 671 kc/s (447 m.); 0.8 kw.
Transmits at intervals from 8.0 a.m. 5.0 p.m.—Pacheloup Symphony Concert.
6.30 p.m.—Radio-Journal de France.
8.0 p.m.—Talk by M. Géville.
8.15 p.m.—Sports Notes.
8.30 p.m.—Talk by M. Cépède.
8.45 p.m.—Concert—the Composer Léon Raiter conducting. After the Concert: News, Time and Weather and Dance Music from the Coliseum de Paris.
12 midnight (approx.)—Close Down.

PARIS (France)

Eiffel Tower (FL). 206 kc/s (1,455 m.); 12 kw.
7.50 a.m.—Time Signal on 9,231 kc/s (32.5 m.).
9.20 a.m.—Time Signal on 113.13 kc/s (2,650 m.).
5.0 p.m.—Pacheloup Concert.

7.10 p.m.—Meteorological Forecast.

7.20 p.m.—*Song Recital*. Les Amants de Venise. Argentina. La Chanson des heures (Privas). Ah, c'qu'on s'aime (Bosc). Ton baiser dans la nuit (Stermann). Mon coeur est près de ton coeur, and Mon ami Pierrot (Zimmermann). Mazurka (Bulli). Pour un mot (Parera). Nights in Toledo (Nicholls). Nous serons heureux (Barancey). Casanova (Stermann). Hawaiian Song (Stermann). J'ai perdu le coeur de ma mie. Les nuits (Cloerrec-Maupas). The Dead Bird (Heintz). Quand ton coeur s'ouvrira (Rudde-Glaifer). Petite Lisette (Goublier). After the Programme: "The New Poor"—Sketch (Deberre). At 7.56 p.m.—Time Signal on 9,231 kc/s (32.5 m.).
10.26 p.m.—Time Signal on 113.13 kc/s (2,650 m.).

PARIS (France)

Petit Parisien. 914 kc/s (329 m.); 0.5 kw.
8.30 p.m.—Transmission of Pictures.
8.45 p.m.—Gramophone Records, Talk and News Bulletin.
9.0 p.m.—Concert. Prelude to "L'ouragan" (Bruneau). Suite in D for Trumpet and Orchestra (d'Indy). Finale from the Seventh Symphony (Beethoven). Valse Caprice, for Piano and Quartet; Wedding Cake (Saint-Saëns). Suite from "Jonny spielt auf" (Krenek). Valses nobles et sentimentales, Nos. 4, 5 and 6 (Ravel). Diverissement flamand (Vidal).

PARIS (France)

Radio-Paris (CFR). 174 kc/s (1,725 m.); 12 kw.
Transmits at intervals from 6.45 a.m. 12.30 p.m.—Gramophone Concert. In the interval at 1.0 p.m.—Exchange Quotations and News.
2.0 p.m.—Exchange; Market Prices.
3.30 p.m.—Exchange Quotations.
3.45 p.m.—Programme for Children: "Round the Camp-fire."
4.15 p.m.—Dance Music Programme.
4.45 p.m.—News Bulletin.
6.0 p.m.—Agricultural Report and Racing Results.
6.30 p.m.—New York Closing Prices.
6.35 p.m.—Gramophone Concert.
7.15 p.m.—Talk: The Soil and its Effect on Cancer.

7.45 p.m.—Market Prices, Economic and Social Review, News and Amusement Guide.

8.0 p.m.—Talk on Gardening.
8.15 p.m.—*Pianoforte Recital from the Works of De Séverac*. Coin de cimetière au printemps and Le jour de la foire, from "En Languedoc."
8.30 p.m.—Sports Review and News.
8.45 p.m.—Concert of Popular French and Cabaret Songs.
9.15 p.m.—Press Review and Time Signal.
9.30 p.m.—Gramophone Records.

POSEN (Poland)

806 kc/s (335 m.); 1.2 kw. Relayed on 9,428 kc/s (31.8 m.), from 6.30—7.0 p.m., and 9.15—1.0 a.m. (Sunday).
Transmits at intervals from 6.15 a.m. 7.0 p.m.—Miscellaneous Items.
7.15 p.m.—Programme for Women.
7.30 p.m.—Programme from Warsaw. Theatre and Station Notes in the intervals.
9.0 p.m.—Time; Sports Notes; News.
9.15 p.m.—Transmission of Pictures.
9.45 p.m.—Gramophone Cabaret Concert.
11.0 p.m.—Concert arranged by Messrs. Philips.
1.0 a.m. (Sunday)—Close Down.

PRAGUE (Czechoslovakia)

Strasnice. 617 kc/s (487 m.); 5 kw.
Transmits at intervals from 10.15 a.m. 6.0 p.m.—Time and News.
6.5 p.m.—Concert of Popular Orchestral Music.
7.0 p.m.—Recital of Operetta Melodies.
7.30 p.m.—Concert by the Czech Philharmonic Orchestra from the Smetana Hall.
8.35 p.m.—Orchestral Concert with Pianoforte Solos.
9.0 p.m.—Time, News and Sports Notes.
9.20 p.m.—Concert from the Café Lloyd.
9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.
10.0 p.m.—Concert from the Café Prague.

PRAGUE (Czechoslovakia)

7.30 p.m.—Concert by the Czech Philharmonic Orchestra from the Smetana Hall.
8.35 p.m.—Orchestral Concert with Pianoforte Solos.
9.0 p.m.—Time, News and Sports Notes.
9.20 p.m.—Concert from the Café Lloyd.
9.55 p.m.—Programme and Miscellaneous Announcements; Theatre Review.
10.0 p.m.—Concert from the Café Prague.

ROME (Italy)

Ente Italiano Audizioni Radiofoniche (IRO). 680 kc/s (441 m.); 2.4 kw.
Transmits at intervals from 12 noon.

7.30 p.m.—News, Weather, Wireless Notes and Time Signal.

8.2 p.m.—*Military Band Concert*. March Op. 108 (Mendelssohn). Andante and Toccata for Organ (Renzi). Gaiezza (Cirenci). Il Cugino Paupoulette—One-Act Sketch (Braunner and Grunwald). A Bengasi (Ruspantini). Selection from "Fedora" (Giordano). Albulblat and Prelude to Act 3 of "Lohengrin" (Wagner). Selection from "La Schiava Saracena" (Mercandante). In the interval, Literary and Art Review.
10.5 p.m.—News Bulletin.

STOCKHOLM (Sweden)

Radiotjänst (SASA). 689 kc/s (436 m.); 1.5 kw. Relayed by Boden, 250 kc/s (1,200 m.); Göteborg, 932 kc/s (322 m.); Hörby, 1,166 kc/s (257 m.); Motala, 223 kc/s (1,345 m.); Östersund, 389 kc/s (770 m.); Sundsvall, 554 kc/s (542 m.).
Transmits at intervals from 6.15 a.m. 6.15 p.m.—Introductory Talk to the following Transmission.
6.30 p.m.—"Lohengrin"—Opera in Three Acts (Wagner) from the Royal Opera House. In the intervals, at 7.30 p.m.—News Bulletin, and at 9.5 p.m.—Weather Report.
10.15 p.m. (approx.)—Close Down.

STUTTGART (Germany)

Süddeutscher Rundfunk. 833 kc/s (360 m.); 1.5 kw. Relayed by Freiburg, 527 kc/s (570 m.).
Transmits at intervals from 9.0 a.m. 3.0 p.m.—See Frankfurt.
4.45 p.m.—Time and Sports Notes.
5.0 p.m.—Talk: German Rhetoric.
5.30 p.m.—Hans Brandenburg reads from his own works.
6.0 p.m.—Talks: Methods of Payment.
6.30 p.m.—Programme from Frankfurt.
7.0 p.m.—"Der Musikfeind"—Operetta in One Act (Richard Genée).
8.0 p.m.—Programme from Frankfurt.
9.15 p.m.—Zither and Guitar Recital.
10.15 p.m.—News Bulletin.
10.30 p.m.—Programme from Frankfurt.
11.0 p.m.—Freedom Festival, relayed from Coblenz.

TURIN (Italy)

Ente Italiano Audizioni Radio-

foniche (I TO). 1,030 kc/s (291 m.). 7 kw.

Transmits at intervals from 7.15 a.m. 7.30 p.m.—Time Signal.
7.32 p.m.—*Quintet Selections*. Overture, "Zampa" (Herold). Romance in F Minor (Tchaikovsky). Selection from "Don Pasquale" (Donizetti).
8.5 p.m.—Relay of an Operetta. In the intervals, Talks: (a) Historic and Fantastic Personalities, (b) Our Children and Ourselves. After the Operetta, Dance Music Programme. In the interval at 10.30 p.m.—Wireless News.
11.5 p.m.—Relay from America.
12 midnight (approx.)—Close Down.

VIENNA (Austria)

Radio-Wien. 581 kc/s (516.3 m.); 15 kw. Relayed by Graz, 851 kc/s (352.5 m.); Innsbruck, 1,058 kc/s (283.5 m.); Klagenfurt, 662 kc/s (453.2 m.); and Linz, 1,220 kc/s (245.9 m.).
Transmits at intervals from 10.0 a.m. 5.55 p.m.—*Chamber Music*. Pianoforte Solos: Preludes and Fugues from "Das wohltemperirte Klavier" (Joh. Seb. Bach). Pianoforte Quintet, Op. 70 in B flat Major (Jos. Vockner)—the Composer at the Pianoforte.
6.55 p.m.—Time and Weather.
7.0 p.m.—"Steel and Stone"—Folk Play with Songs in Three Acts (Ludwig Anzengruber), on the occasion of the Ninetieth Anniversary of his Birth and the Fortieth of his Death. After the Play, Orchestral Dance Music, followed by Phototelegraphy Transmission.

WARSAW (Poland)

Polskie Radio. 212 kc/s (1,411 m.); 8 kw.
Transmits at intervals from 10.58 a.m. 7.0 p.m.—Programme Announcements.
7.15 p.m.—Talk: Picturesque Harbours Towns.
7.30 p.m.—Concert of Light Music.
9.0 p.m.—Talk: How to buy and sell.
9.15 p.m.—Weather, Police and Sports Notes.
9.25 p.m.—Talk and News.
10.0 p.m.—Dance Music, relayed from the Bristol Hotel.
11.0 p.m. (approx.)—Close Down.

PHILIPS RECTIFYING VALVES

For:

- RELIABLE
- H. T. SUPPLY
- DEPENDABILITY
- LONG LIFE
- HIGH EFFICIENCY

—An output easily varied and smoothed

—The rectifier that has withstood the greatest of all tests—TIME.



Representative Types:

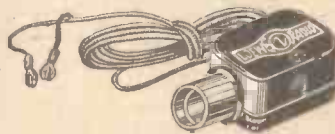
Type 506. Full wave type. Filament voltage 4 volts. Filament current 1 amp. Anode volts—2 x 300 volts. R.M.S. max. Rectified current 75 mA. Price 20/-

Type 505. Half wave type. Filament voltage 4 volts. Filament current approx. 1 amp. Anode volts R.M.S. 400 v. max. Max. value Rect [Current 60 mA. Price 15/-

Type 373. Half wave type. Filament voltage 4 volts. Filament current 1 amp. Anode voltage 220 volts. R.M.S. max. Rectified current 40 mA. Price 15/-

Philips make rectifying valves for voltages up to 4,000 and currents up to 40 amps.

LOEWE RADIO



GRAMOPHONE PICK-UP LR.92 18/6



HIGH VACUUM RESISTANCES 1/6

HIGH VACUUM CONDENSERS 1/3 & 1/6

CONE SPEAKER E.B.7. 45/-

CONE SPEAKER UNIT L.S.71 13/6

All Loewe Radio Products amounting to a total sum of not less than £5 can be obtained on attractive H.P. terms. Full details from your dealer.

The Loewe Radio Co. Ltd., 4, Fontayne Rd., Tottenham, N.15.

PLUG IN TO



PERFECT RADIO

In appearance it's only a simple plug. But it adds so much to the versatility of the TRIX Portable Five. It enables you to plug in to perfect radio from the mains. By simply pushing in the plug shown in the illustration, the internal H.T. is disconnected automatically, and the set works from any H.T. eliminator, giving far better tone and greater range. Far more economical, too! Unique! Absolutely! Cut out Brookman's Park, too, if you wish. Full particulars of this wonder set on request.

TRIX 17 GNS. PLUS ROYALTY. Prov. Pat. 27582/29.
Portable FIVE ERIC J. LEVER (TRIX) LTD., 8/9, Clerkenwell Green, London, E.C.1. Phone: Clerkenwell 3014/5.

PHILIPS for Radio

Advert. PHILIPS RADIO, PHILIPS HOUSE, 145, CHARING CROSS ROAD, LONDON, W.C.2.

Stations in Order of Frequencies and Wavelengths

Corrected in accordance with the latest official information available at the time of going to press

Kc/s	M.	Station	Dial Readings	Kc/s	M.	Station	Dial Readings	Kc/s	M.	Station	Dial Readings
EUROPEAN											
155	1935	Kaunas (Lithuania), 7 kw.		797	377	Manchester (2ZY) (Gt. Britain), 1 kw.				Abo (Finland), 0.5 kw.	
160	1875	Huizen (Holland), 6.5 kw.		806	372	Hamburg (Germany), 1.5 kw.				Kalmar, 0.2 kw. (relays Stockholm).	
167	1796	Lahti (Finland), 40 kw.		815	368	Radio LL (France).				Säffle, 0.4 kw. (relays Stockholm).	
174	1725	Radio Paris (CFR) (France), 12 kw.		815	368	Seville (Union Radio) (EAJ5) (Spain), 1.5 kw.				Eskilstuna (Sweden), 0.2 kw. (relays Stockholm).	
183.5	1635	Königswusterhausen (Zeosen) (Germany), 26 kw.	823	364.5	364.5	Algiers (Algeria).		1220	246	Jakobstad (Finland), 0.25 kw.	
193	1554	Daventry (5XX) (Gt. Britain), 25 kw.	824	364	364	Bergen (Norway), 1 kw.				Linz (Austria), 0.5 kw.	
202.5	1481	Moscow (Old Komintern) (RA1) (Russia), 12 kw.	833	360	360	Stuttgart (Germany), 1.5 kw.				Kiel (Germany) (relays Hamburg), 0.35 kw.	
207.5	1444	Eiffel Tower (FL) (France), 12 kw.	842	356	356	London (2LO) (Gt. Britain), 30 kw.				Cassel (Germany) (relays Frankfurt), 0.25 kw.	
212.5	1411	Warsaw (Poland), 8 kw.	851	352	352	Graz (Austria) (usually relays Vienna), 7 kw.				Kiruna (Sweden) (relays Boden), 0.2 kw.	
222.5	1348	Motala (Sweden) (relays Stockholm), 30 kw.	855.5	351	351	Leningrad (U.S.S.R.), 1.2 kw.		1238	242	Cartagena (Spain), 0.4 kw.	
230	1304	Kharkov (U.S.S.R.), 4 kw.	860	349	349	Barcelona (Radio Barcelona) (EAJ1) (Spain), 8 kw.		1243.4	241.3	Belfast (2BE) (Ireland), 1 kw.	
250	1200	Stamboul (Turkey), 5 kw.	839	345.2	345.2	Fredrikstad (Norway) (relays Oslo), 0.7 kw.				Rjukan (relays Oslo), Norway, 0.18 kw.	
250	1200	Boden (Sweden), 0.6 kw.	878	342	342	Brno (Czechoslovakia), 2.4 kw.		1256	239	Nimes (France), 1 kw.	
260	1153	Kalundborg (Denmark), 7.5 kw.	887	338.2	338.2	Brussels, No. 2 (Belgium) Flemish programme.		1258	239	Nürnberg (Germany) (relays Munich), 2 kw.	
268.8	1116	Novosibirsk (Russia), R.A. 4kw.	890	337	337	Bremen (Germany) (relays Hamburg), 0.35 kw.		1260.4	238	Bordeaux-Sud-Ouest (France)	
279.6	1073	Rostov-Don (Russia), 12 kw.	895	335	335	Cadiz (Spain), 0.5 kw.		1265	237	Juan-les-Pins (Nice) (France)	
280	1071	Scheveningen Haven (Holland), 2.5 kw. (until 5.40 p.m. only)	896	336	336	Posen (Poland), 1.2 kw.		1265	237	Orebrö (relays Stockholm) (Sweden), 0.2 kw.	
280	1071	Hilversum (Holland), 6.5 kw. Daily after 5.40 p.m.	905	332	332	Naples (1NA) (Italy), 1.5 kw.		1273.5	235.5	Charleroi (Belgium)	
297	1010	Basle, 0.25 kw.	914	329	329	Grenoble (PTT) (France).		1283	234	Münster (Germany), 0.5 kw.	
300	1000	Leningrad (Russia), 20 kw.	914	329	329	Paris—Petit Parisien (France).				Boras (relays Göteborg) (Sweden), 0.15 kw.	
320	938	Moscow (CCSP), 2 kw.	923	325	325	Breslau (Germany), 2 kw.		1301	231	Umea (Sweden), 0.2 kw.	
344.8	870	Tiflis, 4 kw.	932	322	322	Göteborg (Sweden), 10 kw.				Malmö (Sweden), 0.6 kw.	
357	840	Nijni Novgorod, 1.8 kw.	932	322	322	Falun (Sweden), 0.5 kw.				Hälsingborg (Sweden), 0.2 kw.	
375	800	Kiev, 1.2 kw.	941	319	319	Dresden (Germany), 0.25 kw.		1313	228.4	Biarritz (Côte d'Argent, France), 1.5 kw.	
385	778	Petrozavodsk (Russia), 2 kw.	950	316	316	Marseilles (PTT) (France), 0.5 kw.		1319	227	Cologne (Germany), 2 kw.	
389	770	Ostersund, 0.6 kw. Relays Sundsvall.	955.4	314	314	Oviedo (Spain), 0.7 kw.		1337	224.4	Cork (6CK) (Ireland), 1 kw.	
395	760	Geneva (Radio-Genève), 0.25 kw.	959	313	313	Cracow (Poland), 0.5 kw.		1345	223	Radio Luxembourg (Experimental), 3 kw. 8—9 p.m. daily.	
428	700	Minsk (Russia), 4 kw.	968	310	310	Cardiff (SWA) (Gt. Britain), 1 kw.		1355	221	Helsingfors (Finland), 0.9 kw.	
442	680	Lausanne (Switzerland), HBz, 0.6 kw.	973	308	308	Radio-Vitus (France), 1 kw.		1364	220	Fécamp (Radio)	
527	570	Freiburg-im-Breisgau (Germany), 0.35 kw.	973	308	308	Zagreb (Yugoslavia), 0.7 kw.		1370	219	Radio-Beziers (France), 0.6 kw.	
527	570	Hamar (relays Oslo), 0.7 kw.	981.7	305.6	305.6	Agen (France).				Radio-Beziers (France), 0.6 kw.	
530	566	Ljubljana (Yugoslavia), 2.5 kw.	986	304	304	Bordeaux-Lafayette (PTT), France, 1 kw.		1373	218	Radio-Beziers (France), 0.6 kw.	
531	565	Smolensk (U.S.S.R.), 1.5 kw.	995	301	301	Aberdeen (2BD) (Gt. Britain), 1 kw.				Radio-Beziers (France), 0.6 kw.	
536	560	Augsburg (Germany), 0.25 kw.	1004	298.8	298.8	Hilversum (Holland), 6.5 kw. Daily until 5.40 p.m.		1490	202	Radio-Beziers (France), 0.6 kw.	
545	550	Budapest (Hungary), 20 kw.	1013	296	296	Tallinn (Estonia), 0.7 kw.		1500	200	Leeds (2LS) (Gt. Britain), 0.13 kw.	
554	542	Sundsvall (Sweden), 0.6 kw.	1022	293	293	Kosice (Czechoslovakia), 2 kw.		1530	196	Karlskrona (relays Stockholm) (Sweden), 0.25 kw.	
563	533	Munich (Germany), 1.5 kw.	1022	293	293	Limoges (France), 0.5 kw.					
572	525	Riga (Latvia), 3 kw.	1030.3	291.1	291.1	Turin (Italy), 7 kw.					
581	517	Vienna (Rosenhügel) (Austria), 15 kw.	1031	291	291	Viborg (Finland), 0.4 kw.					
585	511	Archangel (U.S.S.R.), 1.2 kw.				Bournemouth (6BM) (Gt. Britain), 1 kw.					
590	509	Brussels No. 1 (Belgium), 1 kw.				Bradford (2LS) (Gt. Britain), 0.13 kw.					
599	501	Milan (Italy), 7 kw.				Dundee (2DE) (Gt. Britain), 0.13 kw.					
603.5	497	Moscow, 1.2 kw.				Edinburgh (2EH) (Gt. Britain), 0.35 kw.					
608	493	Oslo (Norway), 1.2 kw.				Hull (6KH) (Gt. Britain), 0.13 kw.					
617	487	Prague (Czechoslovakia), 5 kw.				Liverpool (6LV) (Gt. Britain), 0.13 kw.					
626	479	Daventry (5GB) (Gt. Britain), 25 kw.	1040	288.5	288.5	Newcastle (5NO) (Gt. Britain), 1 kw.					
630	476	Simferopol (Russia), 1.2 kw.				Plymouth (5PY) (Gt. Britain), 0.13 kw.					
635	473	Langenberg (Germany), 13 kw.				Sheffield (6FL) (Gt. Britain), 0.13 kw.					
644	466	Lyon (La Doua), France (relays Ecole Supérieure), 5 kw.				Stoke-on-Trent (6ST) (Gt. Britain), 0.13 kw.					
663	459	Zürich (Switzerland), 0.6 kw. (Porsgrund relays Oslo), 0.7 kw.				Swansea (5SX) (Gt. Britain), 0.13 kw.					
		Aix-la-Chapelle (Germany), 0.35 kw.	1049	286	286	Lyon (Radio) (France), 0.5 kw.					
		Aalesund (Norway), 0.3 kw.	1049	286	286	Montpellier (France), 0.2 kw.					
		Salamanca (Spain), EAJ22, 1 kw.				Notodden (Norway), 0.05 kw.					
		Bolzano (Italy) 1 BZ, 0.2 kw.				Magdeburg (Germany), 0.5 kw.					
662	453	Danzig, 0.25 kw. (relays Königsberg).				Innsbruck (Austria), 0.5 kw.					
		Klagenfurt, 0.5 kw. (relays Vienna).	1058	283	283	Stettin (Germany), 0.5 kw.					
		Tromsø (Norway), 0.1 kw.				Berlin Relay (Germany), 0.5 kw.					
		Uppsala, 0.15 kw. (relays Stockholm).				Uddevalla (Sweden), 0.05 kw. (relays Göteborg).					
		Tammerfors, relays Helsingfors, 0.8 kw.	1067	281	281	Varberg (Sweden), 0.3 kw.					
666.5	450	Moscow (S.P.) RA2, 1 kw.	1071	280	280	Copenhagen (Denmark), 0.75 kw.					
671	447	Paris (PTT) (Ecole Supérieure), France, 0.8 kw.	1076	279	279	Radio-Liége.					
680	441	Rome, (IRO) (Italy), 2.4 kw.	1085	276	276	Bratislava (Czechoslovakia), 12.5 kw.					
689	436	Stockholm (Sweden), 1.5 kw.	1103	272	272	Königsberg (Germany), 2.5 kw.					
689	436	Malmberget (relays Boden) (Sweden), 0.25 kw.				Rennes (France), 0.5 kw.					
698	430	Belgrade (Yugoslavia), 2.5 kw.				Trollhättan, 0.45 kw. (relays Göteborg).					
702.5	427	Kharkov (Russia), 4 kw.				Hudiksvall, 0.15 kw. (relays Sundsvall).					
707	424	Madrid (Union Radio) (EAJ7) Spain, 2 kw.	1112	270	270	Norrköping (Sweden), 0.25 kw. (relays Stockholm).					
716	418	Berlin (Witzleben) (Germany), 1.5 kw.				Kaiserslautern (Germany), 0.25 kw.					
725	413	Dublin (2RN) (Ireland), 1 kw.	1121	268	268	Barcelona (Radio Catalana) (EAJ13), 10 kw.					
727	412	Rabat (Morocco), 10 kw.				Strasbourg (France), 0.1 kw.					
734	408	Katowice (Poland), 10 kw.	1121	268	268	Lille (PTT) (France), 0.7 kw.					
743	403	San Sebastian (EAJ8) (Spain), 0.3 kw.	1130	265.4	265.4	Moravska-Ostrava (Czechoslovakia), 10 kw.					
743	403	Berne (Switzerland), 1 kw.	1139	263	263	Leipzig (Germany), 1.5 kw.					
752	399	Glasgow (5SC) (Gt. Britain), 1 kw.	1157	259	259	Hörby (Sweden), 10 kw.					
761	394	Bucarest (Roumania), 12 kw.	1166	255	255	Toulouse (PTT), (France), 1.5 kw.					
770	390	Frankfurt (Germany), 1.5 kw.	1175	255	255	Gleitwitz (Germany), 5 kw.					
779	385	Genoa (IGE) (Italy), 1 kw.	1184	253	253	Almeria (Spain) (EAJ18), 1 kw.					
779	385	Wilno (Poland), 0.5 kw.	1193	251	251	Schaerbeck (Brussels) (Belgium)					
788	381	Toulouse (Radio), (France), 8kw.	1196.6	250.9	250.9						

DEVIATIONS

The following are the actual deviations from the Prague Plan frequencies, as noted during measurements made at the Tatsfield Checking Station. All differences of 1.0 kc/s and over are shown.

514.75	582.7	Ljubljana (Yugoslavia)
530.1	565.8	Augsburg (Germany)
750.3	399.8	San Sebastian (Spain)
766.25	391.5	Bucarest (Roumania)
854.8	346.9	Barcelona, EAJ1 (Spain)
952.1	315.1	Marseilles, PTT (France)
1220	245.8	Schaerbeck (Belgium)

EXTRA-EUROPEAN STATIONS

U.S.A.		
660.1	454	New York (WEAF), 25 kw.
700	428.5	Cincinnati, O. (WLW), 25 kw.
720	416.6	Chicago, Ill. (WGN), 25 kw.
760	395	Bound Brook, N.J. (WJZ), 25 kw.
770	389	Chicago, Ill. (WBBM), 25 kw.
790	380	Schenectady, N.Y. (WGY), 50 kw.
980	306	Pittsburg, Pa. (KDKA), 25 kw.
990	303	Springfield, Mass. (WBZ), 15kw.
1090	275.2	St. Louis, Mo. (KMOX), 25 kw.
CANADA		
690	434	Calgary (CFCN), 1.8 kw.
690	434	Toronto (CKGW), 5 kw.
730	411	Montreal (CNRN), 1.6 kw.
AUSTRALIA		
665	451	Sydney (2FC), 5 kw.
690	435	Perth (6WF), 5 kw.
734	409	Adelaide (5CL), 5 kw.
779	385	Brisbane (4QG), 5 kw.
808	371	Melbourne (2LO), 5 kw.
838	358	Sydney (2BL), 5 kw.
EAST AFRICA		
750	400	Nairobi, Kenya (7LO).
SOUTH AFRICA		
677	443	Johannesburg (JB), 10 kw.
713	410	Durban, 1.5 kw.
815	363	Cape Town, 1.5 kw.

For Complete List of Short Wave Stations see page 817

**LONGER
RANGE!**

**GREATER
VOLUME!**

MODERNISE your Set — renew its vigour — fit the wonderful **NEW** Cossor Valves. Why be satisfied with indifferent Wireless? The **NEW** Cossor will bring you stations that you never heard before — they'll give you full-toned melody, richer, clearer than you've ever known. No other make of valve will give you such amazing improvement. Use the **NEW** Cossor throughout your Receiver — they are made in seven types to suit every kind of Set. All Wireless Dealers stock the 2 volt range.



**BETTER
TONE!**

The

NEW

COSSOR

THE NEW CELESTION LOUDSPEAKER

Z.20.

Holds undisputed rank as the finest of all Loudspeakers

"Finest loudspeaker I have heard ... sets entirely new standard ... worth every penny it costs."
"Help Yourself" Annual.

"Nearest approach to the ideal that I have yet heard."
"Sphere."

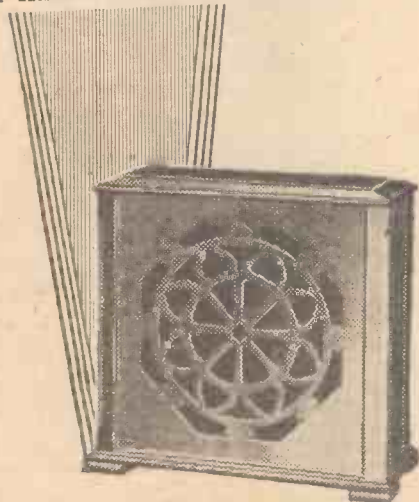
"Most critical musician could not find fault ..."
"Evening Chronicle."

"Sets a standard. Amazingly true reproduction. Low frequencies as well as high."
"Daily Mirror."

"Renowned for brilliancy and quality ... speech and music particularly good ... a handsome instrument."
 PERCY HARRIS in *"Wireless Constructor."*

Designed specifically to give the finest possible results with any set from a Two-Valver to a Power Amplifier. Crowned with the Celestion hallmark — a beautifully designed and hand-polished cabinet.

In Oak £7 : 15 : 0,
 Mahogany £8 : 5 : 0,
 Walnut (to order) £9 : 0 : 0.
 Other Celestion models from £3 : 15 : 0



WRITE FOR AN ABSORBING FREE BOOK ON "SOUND RE-CREATION"

CELESTION

The Very Soul of Music

London Showrooms :
 106, Victoria Street, S.W.1.

Write to : Celestion Ltd.,
 Dept. F. Kingston-on-Thames.

FOREMOST NAME IN SOUND REPRODUCTION

WORLD-RADIO STATION IDENTIFICATION PANEL

Saves all difficulties in finding and recognising

EUROPEAN STATIONS.

Wavelengths, frequencies, call signs clearly set out, together with maps of European Stations.

Apply
1/- B.B.C. BOOKSHOP, 1/-
 Savoy Hill, W.C.2. Post Free.

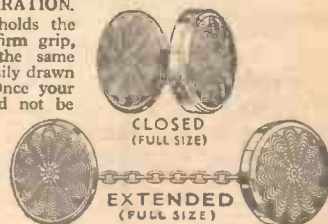
HOLD YOUR CUFFS TOGETHER

WITH THE NEW CUFF "EXPANDA" LINKS



THE LINKS OF THIS GENERATION.
 The new "EXPANDA" cuff link holds the shirt cuff together with a close, firm grip, giving a neater appearance. At the same time, the cuff can be quickly and easily drawn up without unfastening the link. Once your cuff links are in position they need not be removed until the shirt is again ready for the laundry.

Rolled Gold and Enamel. Single extension (1 in.) 3/6 per pair.
Rolled Gold. Double extension. (2 in.) 3/6 per pair.
 Also in Rolled Gold—single extension—2/6 per pair.



The links for the busy man. Nothing to go wrong. - - No loose parts.

Sold by all good class Gents' Outfitters. If any difficulty please write direct to the manufacturers. **STRATTON & CO., LTD.**, Ealmoral Works, Birmingham.

HAVE YOU HEARD A SET YOU WOULD LIKE TO OWN?

we supply **EVERYTHING WIRELESS** for **CASH** or **EASY TERMS**

ALL COMPONENTS, SETS, SPEAKERS, H.T. Units, Accumulators, etc., SUPPLIED

The following are examples of our terms.
KIT:-
COSSOR 1930. Cash £8 15 0. Send 16/-, balance by 11 monthly payments of 16/-.
NEW OSRAM MUSIC MAGNET. Cash £9. Send 16/6 and balance by 11 monthly payments of 16/6.
MULLARD ORGOLA KIT WITH CABINET. Cash £7 15 0. Send 14/3. balance by 11 monthly payments of 14/3.
CELESTION C.12 Oak Speaker. Cash £5 12 6. Send 10/4 and balance by 11 monthly payments of 10/4.
EKCO A.C. All-Power Unit C2A. Cash £10 17 6. Send 20/- and balance by 11 monthly payments of 20/-.
 Any Constructor's Kit or set from Blue Print built and tested for only 10/- extra (plus Marconi Royalties at 5/- per valve-holder).
P.W. Sets, Magic Three, Titan Sets, Brookmans 3, P.W.4, "A.W." Sets, Clarion 3, Knife-Edge 3, Music Leader, Talisman 2-3.
 Call, write or phone, giving a list of your requirements—**CASH PRICES** or best **MONTHLY TERMS** by return of post.
QUICKEST DELIVERY IN LONDON. EXPERT ADVICE AT YOUR SERVICE.
The P.D.P. Co., Ltd., 121, CHEAPSIDE, LONDON, E.C.2.
 Tel.: National 9846.

COMPLETE RECEIVERS:-
PHILLIPS ALL-ELECTRIC Type 2514. Cash £23. Send £2 15 0 and balance by 12 monthly payments of 36/-.
COSSOR ALL-MAINS. Cash £10 10 0. Send 19/3, bal. by 11 payments of 19/3.
LANGHAM POPULAR PORTABLE. Cash 16 Gns. Send £2 and balance by 12 monthly payments of 27/5.
NATIONAL PORTABLE. Cash 15 Gns. Send 26/8 and balance by 12 monthly payments of 26/8.
 Other sets, by Pye, Halcyon, Burndept, McMichael, Marooniphone, Rolls, Selector, etc., etc.

PUBLIC OPINION
 (WIRELESS WORLD NATIONAL BALLOT)
VOTED FIRST PLACE TO

"EKCO"

**Power Supply Units
 as the best of all
 Mains Supply Units**

In the Annual Olympia "Wireless World" Ballot the public awarded the "EKCO-LECTRIC" All-Power Supply Unit first place amongst the keenest and largest competitive field of radio, viz: All-Mains Supply Units.

You can "EKCO-LECTRIFY" your present set with an "EKCO" All-power Unit and eliminate H.T. or L.T. batteries with an "EKCO" H.T. or L.T. Unit respectively, or enjoy modern radio at its best with an "EKCO-LECTRIC" Radio Receiver. Just plug in the "EKCO" Adaptor and "Switch-on—That's all!"

"EKCO" products are British Made for D.C. as well as A.C. Mains and are obtainable on Easy Payments.

TWO POPULAR "EKCO" H.T. UNITS



For one to five valve sets, or those not requiring more than 20 m/a. Westinghouse Rectifier in A.C. Models.

D.C. MODEL IV. 20.

Tapping for S.G. Valve, also at 0-120 and 120/150 volts.
 Complete £2-10-0



A.C. MODEL 3F. 20.

Tapping for S.G. Valve, also at 60 and 120/150 volts.
 Complete £3-19-6

"EKCO"

"Plug-in—That's all!"

Ask your dealer, or write for Free Booklet on "All-Electric Radio" to:
 E. K. COLE, LTD., DEPT. W.R., "EKCO" WORKS, LEIGH-ON-SEA.



STANDARD
SAC LEELANCHE

PERMANENT H.T. BATTERY

**NEW CARTRIDGE REFILLS
 MAKE IT SUPREME**

There is little doubt that the Cartridge Sac has made this wonderful permanent Wet Battery a really worth while proposition, that no listener who studies facts can seriously afford to overlook.

IT OUTRIVALS THE DRY BATTERY

There is absolutely no reason why you should continue to put up with the constant expense of buying dry batteries. The Standard Battery is not an experiment, over 10,000,000 Standard cells are in use, proof positive of their efficiency and reliability. The exceptionally steady current they supply improves the clarity and purity of tone out of all recognition. They stand up to the hardest service far better than any dry battery, because they are self-regenerative, and when not in use the battery is recharging itself.

YOU CAN REFILL the STANDARD H.T. BATTERY AT HOME

With the wonderful Cartridge Refills. You merely purchase the requisite number of refills at low cost, and the operation of refilling is simplicity itself. The battery is then just as good as new! Upkeep costs, compared with dry batteries, are usually 50 per cent. less. These are absolute proven facts. A hundred thousand satisfied users bear testimony to Standard, and we seriously ask all listeners to write now for the famous Standard Battery Booklet, that tells you all about this money saving, super efficient H.T.

DEFERRED TERMS. NO DEPOSIT.

The vast bulk of our business is done under these terms, which are simple, fair, and straightforward. Stocked by Halford's Store, Curry's Stores, and all Radio dealers.

LASTS FOR YEARS.

RECHARGE AT HOME AT LOW COST.

SPECIAL OFFER
 No. 3. Cartridge Model battery 90 v. (16 m.a. capacity) comprising 2 trays of 32 cells with lid, electrolyte chemical. Cash £2 13s. 10d. or 9/5 down and 5 equal monthly payments of 9/5

TABLE CABINETS in Oak or Mahogany supplied to hold batteries, and form stand for set, well designed and finished. Oak £2 9s. 6d. Mahogany, £3 0s. 0d.

SEND FOR FREE BOOK

THE STANDARD BATTERY Co.
 (Dept. W.R.) 184/188 Shaftesbury Avenue, London, W.C.2.
 No. 3. Cell 10,000 Milliamps Capacity 7d. Spare Cartridge 5d.
 No. 4 Cell 20,000 Milliamps Capacity 9d. Spare Cartridge 7d.

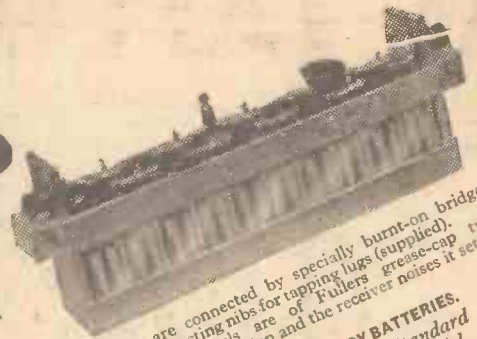


7 POINTS ABOUT SUPER H.T. BATTERIES

1. The RHG 20v., 3.500m.h. H.T. battery illustrated, of course, is constructed with micro-porous paste. It costs 15s.
2. The construction of the separate glass cells, which are self-contained and get-at-able, and the acid-proof crate, allows proper inspection of individual cells.



3. Non-absorbent insulating material, with sloping surfaces, between cells prevents even possible leakage due to spilt liquid.
4. Dished lids drain all liquid into the cell, the outside of which is thus kept dry and leakage to earth prevented. No vents and attendant troubles.
5. No separators are necessary as the plates drop into grooves in the cell. Thus they are surrounded by electrolyte; and gas-bubbles can move freely, avoiding receiver noises or variation in output.



6. Cells are connected by specially burnt-on bridges, with projecting ribs for tapping lugs (supplied).
7. Main terminals are of Fuller's grease-cap type, preventing corrosion and the receiver noises it sets up.

ALSO SPARTA DRY BATTERIES.
 60v. (reads 66v.) Standard
 7 1/2v. 60v. Super 13/6d.,
 100v. (reads 108 v.) Standard
 22 1/2v. 120v. Super
 Standard 15/10d.
 9v. Grid Bias 1/6d.,
 16v. Grid Bias 2/10d.



THEY LAST LONGER



SPARTA SUPER BATTERIES

Fuller Accumulator Co. (1926), Ltd., Chadwell Heath, Essex.

SIFAM METERS ARE SUPREME.

Illustrated is an extremely popular Sifam Panel Mounting Milliammeter. Handsome appearance, finished in heavy nickel. Dead-beat readings. Let us send you interesting free leaflet "What simple meters can show you." Send a Milliammeter, Post card now. Moving Iron in models from 2 to 500 M.A. 25/-

CLAUDE LYONS LTD. 76 OLDHALL STREET, LIVERPOOL

SWITCH OFF!

AND SO TO BED

With the restful knowledge that all is well with your set. Happy satisfaction when using a **LYONS' B.A.T. 750 WATT SWITCH** "Best after Test" for all purposes.

Send for FREE 4-pp. circular; request at the same time our famous 36-pp. "CLAROSTAT" Book (all about D.C. and A.C. Mains Units, with scale drawings).

PRICE 2/6

CLAUDE LYONS LTD. 76 OLDHALL STREET, LIVERPOOL

Acquire an accurate knowledge of French and its pronunciation easily, pleasantly, and inexpensively, by means of the

Foylophone French Course

Electrically Recorded

ensuring true reproduction of the all-important accent and inflections of the voice. Three voices—two men and one lady. Complete in 13 twelve-inch double-sided Records, in album, and comprehensive Text-book.

Complete £2 2 0 only.

Deferred payments arranged.

May we send you (gratis) Booklet F.W.R., which gives full particulars.

Foylophone, 119, Charing Cross Road, London, W.C.2. (Gerrard 9310.)

CONNECT TO

Obtainable Everywhere.

EVER READY
BRITAIN'S BEST BATTERIES

—LAST LONGEST

25% increase in RANGE & VOLUME without the aid of extra valves is worth consideration

GOLTONE NEGROLAC AERIAL—will do this.

Do you wish to increase the efficiency of your receiving set 25%? Bring in long distance stations hitherto unobtainable without the aid of extra valves? Add volume, clarity and selectivity to your set? This is the experience of users of "NEGROLAC" Aerial. Your set is capable of far better results. Let us send you pamphlets giving extracts from technical reports, testimonials, and full particulars with sample.

Prices: Coils of 50 ft. 9/-
 " 80 ft. 15/-
 " 100 ft. 18/-

"NEGROLAC INDOOR AERIAL"
 Extraordinarily efficient.
 Prices from **3/-**
 Full particulars on request.

from all first-class Radio Dealers. Re-use substitutes. If any difficulty, write direct.



WHAT USERS SAY—

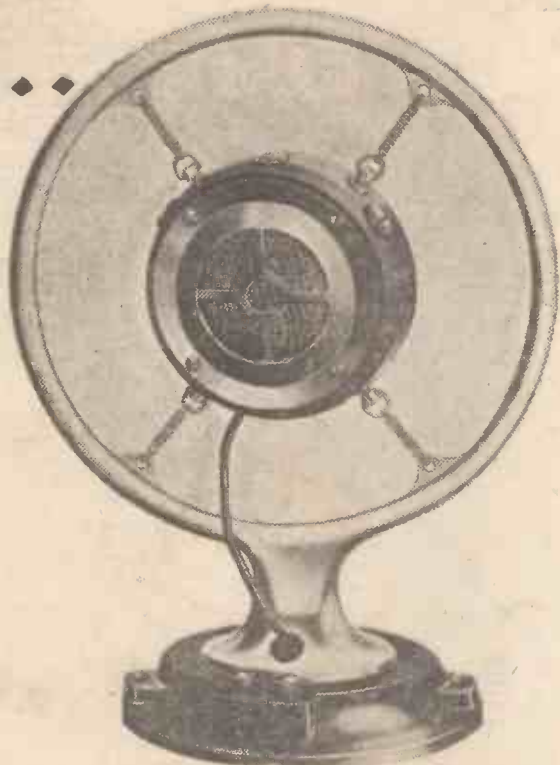
Mr. J. E. M., Pentre, Nr. Wrexham, writes:—"I think your Goltone 'Negrolac' Aerial is just wonderful, the results are simply amazing."

Mr. W. W. R., Crook, Kendal, writes:—"The results are marvellous. I never thought it possible to get such excellent results. The volume is increased, and tone improved beyond words."

Mr. R. H. H., Immingham Dock, Lincolnshire:—"The Negrolac Indoor Aerial brings in Daventry 5XX at quite good Loud Speaker strength. The Negrolac Outdoor Aerial is really a wonderful improvement and brings in at excellent strength the majority of the stations on the Long Wave, and a considerably increased number of Continental Stations on the medium band, and is certainly much more selective with stronger signals than the old aerial."

"NEGROLAC" THE WORLD'S BEST AERIAL

**AS FAITHFUL
AS...**



...AN ECHO

The B.T.H. Microphone offers many ways of amusing your guests this Xmas. For instance, you can organise surprise items and put them over on your own loud-speaker. Or, if there is a member of the party who is skilled at languages, imitations of foreign stations may be given. In any case it's easy to make a noise like Russian or Chinese—and what fun there will be when your deception is discovered.

The B.T.H. Microphone is simple to fix. All that need be done is to connect it through its transformer to your Radio Set and the plot is complete.

This Microphone is well designed, nicely finished and has an excellent frequency response rendering it capable of transmitting speech or music with the utmost fidelity. Ask your dealer for full particulars, including circuit diagram in the Ediswan brown book.



**SPEECH
MICROPHONE**

Price £6.6.0 Transformer 15/-
Deferred Payments can be arranged.

THE EDISON SWAN ELECTRIC CO., LTD.

Head Office Ediswan Radio Division and West-End Showrooms:
1a, NEWMAN STREET, OXFORD STREET, W.1
Phone: Museum 9801.

SHOWROOMS IN ALL THE PRINCIPAL TOWNS.

EDISWAN RADIO PRODUCTS

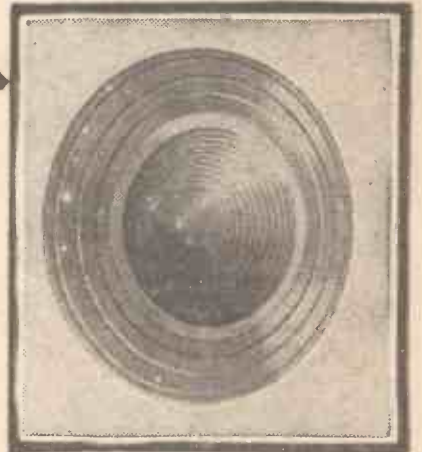
easy...

for the amateur
to build his own
Super
Loudspeaker

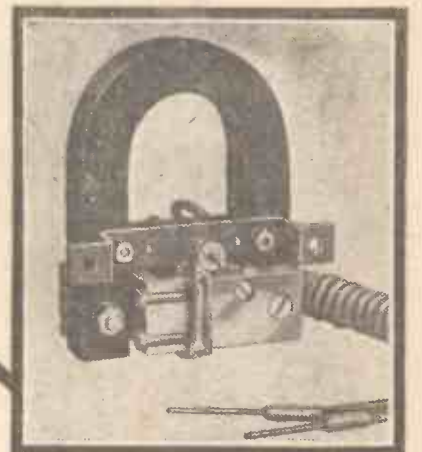
This cone unit and assembly now permits the amateur designer to construct a super-sensitive loudspeaker which is cheaper than a factory built model whilst at the same time allowing him to use his own ideas as to the type of cabinet or baffle to be used.

For the small sum of 15/- for the cone unit and 12/6 for the assembly he can build a loud speaker unequalled in its class for volume, tone and sensitivity.

Like all Ediswan products this unit and assembly combine typically British quality with life-long dependability.



Assembly—Price 12/6



Cone Unit—Price 15/-

**with this
EDISWAN
CONE UNIT &
ASSEMBLY**

THE EDISON SWAN ELECTRIC CO. LTD.

Head Office Ediswan Radio Division and West-End Showrooms:
1a, NEWMAN STREET, OXFORD STREET, W.1
Phone: Museum 9801.

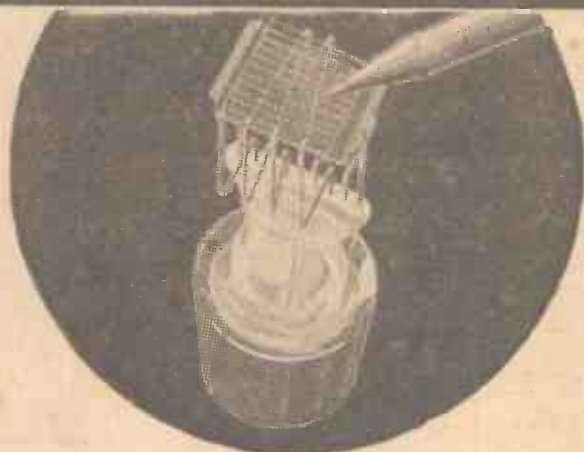
SHOWROOMS IN ALL THE PRINCIPAL TOWNS.

W.35.

THE ONLY FILAMENT THAT HAS STOOD THE TEST OF TIME



THE WONDERFUL P.M. FILAMENT



It's nearly five years now since the designers of the Mullard P.M. Valve got the principle of the filament right—the principle that today holds good.

As a result of their advance in research they are able to give you in every Mullard Valve you buy:—

Increased Emission.	Improved Characteristics.
Greater Efficiency.	Greater Mechanical Strength.

These developments will improve *your* radio receiver, giving you greater volume, longer range and amazing tonal purity—the triumphant results of the Mullard research engineers who worked ahead of their time.

Mullard

THE · MASTER · VALVE

Advt. The Mullard Wireless Service Co., Ltd., Mullard House, Charing Cross Road, London, W.C.2.

ALL ADVERTISEMENTS FOR "WORLD-RADIO" should be addressed to ADVERTISEMENT DEPARTMENT, BRITISH BROADCASTING CORPORATION, 2, SAVOY HILL, W.C.2.—TELEPHONE: 'TEMPLE BAR' 8400.