

THE WIRELESS ENGINEER

INDEX TO ABSTRACTS AND REFERENCES, 1939

PROPAGATION OF WAVES

Possible Effect of Earth's Electric Field on Intensities in Absorption Spectrum of Earth's Lower Atmosphere.—Arlick, 4279.

Absorption of Electromagnetic Waves in the Earth's Atmosphere.—Bajpai & Mathur, 3040.

Theory of Absorption in Ionised Gas: Opacity in Stellar Material, Optical Properties of Liquid Metals.—Majumdar, 1364.

Absorption of Corpuscles in Ionosphere.—Rathgeber, 12.

Researches on Atmospheric Absorption.—Vassy, 1363.

Absorption: see also Arctic, Centimetric, Decametric, Dispersion, Light, Reflection.

Range of Wireless Waves used on Aircraft.—Sylvestre, 7.

Amateur Observations of Short- [and Ultra-Short-] Wave Propagation, and Scientific Research.—Hess, 420.

Anomalous Propagation of Phase in the Focus.—Rubinowicz, 903.

Receiving Conditions in the Arctic.—Hunter, 1347.

Structure of Atmosphere as deduced from Ionospheric Observations.—Appleton, 4292.

Daily Exploration of Atmosphere by Radio Soundings.—Bourgeois, 56.

Wave Form, Energy, and Reflection by the Ionospheres of Atmospheres.—Laby & others, 3898.

Attenuation: see Lines, Ultra-Short.

Auroras.—A. & Short-Wave Reception, 1807 & 2657; Agostinelli, 3460 (Motion of Electrified Corpuscle: Theory of A.); Bailey, 9 & 10 (Generation of As. by Radio Waves); Bernard, 2257 & 3461 (Coloration); Cyanogen: Spectrum Differences between Lower & Upper Height Limits); Fendler, 879 (and 10 m Reception); Götz, Penndorf, 1360 & 2658 (Arosa: Magnetic Storm); Holmes, 3886 (Earth's Electric Field & A.); Log-Roller, 1809 (A. of 24th Feb. & Some Observations); Lugeon, 4312 (Radio-phonetic Perturbations); Mitra & Banerjee, 3459 (Fringe of Atmosphere, & UV-Light Theory); Stagg & Paton, 3462 (and Geomagnetic Disturbances); Störmer, 32 (Height Measurements); 901 (Blue Sunlit A. Rays), 1359 (Red A. Lines); Vegard, 29 & 31 (Papers on Spectrum); White, Goddes, 4313 (Early Observations: Height & Position in New Zealand). See also Arctic, Ionosphere, Ionospheric, Night, Nitrogen.

Australian Radio Research Board, 10th Annual Report: 2. Work on Conditions in Ionosphere, 890.

"Negative Ions" [Book Review].—Massey, 429.

"Etude sur la Théorie des Ondes" [Book Review].—van Mieghem, 977.

"Etude Pratique des Rayonnements Solaire, Atmosphérique, et Terrestre: Méthodes et Résultats" [Book Review].—Maurain, 1806.

Boundary-Waves: see Seismic.

Preliminary Calculations of a Broadcasting Station, 4314.

C Layer: see Tropospheric.

Natural Electromagnetic Oscillations of a Cavity.—Jougniet, 3419 & 3873.

Theory of Ceiling Projector.—Middleton, 4315.

Absorption and Reflection Measurements in Centimetric-Wave Range.—Kehbel, 2444.

Cloud Heights: see Ceiling-Projector.

Coaxial: see Dielectric.

New Contributions to Problem of Energy Transmission by Elementary Collision Processes.—Schüler & Haber, 4239.

Collisions: see also Ionised, Velocity.

Combination Tones in Sound and Light.—Bragg, 2263.

Combination Oscillations [Significance in Various Fields].—Ruprecht, 2264.

Corpuscles: see Absorption.

Solar Activity and Cosmic Rays.—Kolhörster, 1804.

Effect of Cosmic Conditions on Short-Wave Empire Telegraph Circuits.—Wood, 3046.

Critical: see Limiting.

Cyanogen: see also Auroras, Night-Sky.

D Layer: see also Lower.

Note on an Anomaly in Propagation of Decametric Waves [15-60 m] at Short Distances.—de Clejoux, 885.

Corrections to Paper: "Reflection and Absorption of Decimetric Waves at Plane Dielectric Strata."—Dallenbach & Kleinsteuber, 558.

Times of Appearance of Dellinger Effect.—Beckmann, Menzel, & Vilbig, 3048.

Two Dellinger Effects? [from Tokio on 27th April, from German D]D on 28th].—Bill, 20.

The Dellinger Phenomenon.—Kaplan, 1357.

Incident Angle of Short Waves and High-Frequency Noise during Dellinger Effect.—Nakagami & Miya, 4310.

Dellinger-Effect: see also Fade-Out, Fading, Ionosphere, Magnetic, Puerto-Rico.

Natural Electromagnetic Oscillations of Dielectric Spaces.—Borgnis, 3874.

Propagation of Waves along Dielectric Cables.—Brillouin, 873 & 3024.

Propagation in Dielectric Cables, and The Possible Utilisation of Circular Guide Cables.—Brillouin; Clavier, 413.

Theoretical Relationships of Dielectric Guides (Cylindrical) and Coaxial Cables.—Clavier, 1794 & 3024.

Complementary Study on the Coefficients of Attenuation in Cylindrical Dielectric Cables and Coaxial Cables.—Clavier & Altovsky, 872 & 3024.

Contribution to the Propagation of Electromagnetic Waves along Dielectric Wires.—Klemt, 3022.

Dielectric Resonators.—Richtmeyer, 3420.

Electromagnetic Waves in Free Space, in Metal Pipes, and in Dielectric Wires.—Southworth, 3023.

Dielectric: see also Guides, Reflection.

Diffraction of Capillary Ripples: Envelope Waves.—Bonasse, 1370.

Diffraction Theory of Propagation of Ultra-Short Waves.—Eckart, 5.

Diffraction [at Edge of Opaque Screen] of Converging Light Waves.—Frinz-Gottbold & von Laue, 41.

Diffraction and Refraction of Horizontally Polarised Electromagnetic Wave over Spherical Earth.—Gray, 2250.

Diffraction of Wireless Waves round Earth.—Millington, 2840.

Diffraction of Waves by Ribbons and Slits.—Morse & Rubenstein, 905.

Asymptotic Series for Functions in Theory of Diffraction of Light.—Pauli, 908.

Study of Parallel-Light Diffraction.—Savornin, 2634.

Diffraction Theory of Electromagnetic Waves.—Stratton & Chu, 3875.

Effect of Diffraction on Propagation of [Ultra-Short] Electromagnetic Waves beyond the Horizon.—Wundt, 1345.

Impulse Breakdown in Long Discharge Tubes.—Dietrich & Snoddy, 2878.

Dispersion, Absorption, and Polarisation Curves for Radio Wave Propagation in the Ionosphere.—Ghosh, 1349.

Dispersion and Absorption of Short Electric Waves and Molecular Structure.—Keutner & Potapenko, 1796.

Dispersion: see also Water.

Measurement of Distances by means of Ultra-Short Waves (Wireless Range-Finding).—Tiberio, 3032.

Distances: see also Propagation.

Origin of E Layer of Ionosphere.—Mitra, 427.

E Region of Ionosphere.—Hulburt, 2646.

Theoretical Ionisation Curves for E Region.—Wilkes, 881.

E Region: see also Eclipse, Ionisation, Ionosphere (-ic), Reflections.

Echo: see Lorentz, Magnetic, Mars.

Propagation of Ultra-Short Waves: Results of Eckersley's Theory.—Bedeau & de Mare, 4280.

Reports of Ionospheric Changes during a Solar Eclipse.—Appleton & Naismith, 4303.

E Region of Ionosphere during Total Solar Eclipse of 1st Oct. 1940.—Hulburt, 2647.

Ionospheric Eclipse of 1st Oct. 1940, 3446.

Electric Field: see Absorption.

Electrons: see Velocity.

Energy: see Collision.

Explanation of Propagation of Explosion Waves at Boundary between Two Media.—Joos & Teltow, 2342.

Propagation of Explosion Waves in Liquids and Solid Bodies.—von Schmidt, 1368.

Characteristic Variation of Region F₂ Ionisation throughout the Year.—Appleton, 3878.

Further Studies of F Region at Allahabad.—Bajpai & Pant, 3041.

Long-Period Variations in F₂ Region of Ionosphere.—Tani, Ito, & Sinkawa, 894.

F₂ Region: see also Ionosphere, New-Zealand, Solar.

Concerning the Nature of Radio Fade-Out.—Martyn; Berkner, 2653 & 3049.

Fade-Out: see also Dellinger, Fading, Ionospheric, Solar-Eruptions.

Fading.—Statistical Data on Rapid Total Fs., 4309; Bureau, 3450 (Strengthening of Long Waves with F. of Short: Observation by Recording of Atmospherics); Eble, 3451 (Fs. and Terrestrial Magnetism); Feldtkeller & Mayer, 3933 (Selective F. in Broadcast Reception); Jonaust, 3449 (Ionosphere & Rapid Short-Wave F.); Maclean & Wickizer, 3425 & 4281 (Notes on Random F. of 50 Mc's Signals); Mayer, 895 (Selective F. &

Propagation of Waves—

- Non-Linear Distortions; Nasilov, 3047 (Meteorological Origin); Smith, Kroger, & George, 878 (F. on U.S.W. Relay Circuit). See also Fade-Out, Ionosphere-Disturbance, Storm, Ultra-Short.
- Investigations on Faraday Effect in Transparent Media.—Gabler, 4032.
- Accuracy of Radio Field-Intensity Measurement at Broadcast Frequencies.—Diamond, Norton, & Lapham, 1629.
- Design and Construction of Short-Wave [7-11 m] Field-Strength Measuring Set, and Field-Strength Measuring Set for Ultra-Short Waves: Correction to Abstract.—Colebrook & Gordon-Smith: Binshtok, 1797.
- Papers on Direct Reading Field-Strength Measuring Instruments.—Rohde & Spies: Dewitt & Omberg, 1365.
- Nomogram for Determination of Field Strength around a Transmitter.—van Veen, 2641.
- Frequency-Change: see Shanghai.
- Limits of Application of Geometrical Optics to the Study of a Particularly Important Case of Propagation.—Grafti, 2652.
- On "Raster"-Shaped Reflection Gratings.—Helliwege, 1817.
- Gratings: see also Grids, Optical.
- Calculation of Great Circle Bearings.—Addey, 3478.
- The Transparency of Wire Grids towards Electric Waves.—Esau, Ahrens, & Keibel, 2631.
- Ground Radiation and "Vertical Effect" of Closed Aerials.—Sacco, 2675.
- Ground Conductivity Measurements in Canada.—MacKinnon, 3471.
- Ground: see also Soil.
- Correction to Curves in "Ground and Ionospheric Rays."—Ross, 4285.
- Ground-Wave: see also New-Zealand.
- The Quasi-Optics of Ultra-Short-Wave Guides.—Buchholz, 412.
- Experimental Researches on the Propagation of Electromagnetic Waves in Cylindrical Guides.—Clavier & Altovskiy, 3421 & 4277.
- Curved Wave-Guides.—Sonada, Mormoto, & Ito, 4275.
- Guides: see also Cavity, Dielectric, Hollow, Horn, Resonance-Chamber, Tubes, Ultra-High.
- Hamilton's Canonical Equations for Motion of Wave Groups.—Fokker, 4298.
- Height: see Ionosphere, Solar, Stratified.
- The Influence of the Curvature of Rectangular Hollow Conductors on the Phase Constant of Ultra-Short Waves.—Buchholz, 2629.
- Electromagnetic Waves in Hollow Metal Tubes of Rectangular Cross Section.—Chu & Barrow, 1338.
- Transmission of Damped Electromagnetic Waves through Small Hollow Metal Tubes.—Hartig & Mellon, 414.
- Metallic Hollow Conductor of Rectangular Cross-Section as Transmission Path for Electromagnetic Waves.—Riedel, 2630.
- Hollow: see also Guide.
- Homogeneous: see Line.
- The Sectoral Electromagnetic Horn, and Rectangular Hollow-Pipe Radiators.—Barrow & others, 1446 & 1447.
- Electromagnetic Horn Design.—Chu & Barrow, 3944.
- Humidity: see Temperature.
- The Huyghens-Kirchhoff Principle for Any Number of Dimensions.—Müller, 3895.
- The Lyman Lines of Hydrogen in Solar Emission.—Hemmendinger, 3457.
- Incident Angle: see Dellinger-Effect.
- Note on Method of Investigating the Interaction of Radio Waves.—Appleton, 2637.
- Interaction: see also Luxembourg.
- Theoretical Evaluation of Wide-Angle Interference Experiment, and Determination of Nature of Light Source, from Wide-Angle Interference Experiments.—Doermann & Halpern, 2683.
- Interference-Method: see also Distances, Propagation.
- Critical-Frequency Method of Measuring Upper-Atmospheric Ionisation.—Appleton, Naismith, & Ingram, 886.
- Intensity of Ionisation in Earth's Atmosphere [Neglect of Variation of Gravity].—Banerji & Bhatnagar, 3436.
- Variations of Ionisation in F₂ Region of Ionosphere: I.—Meteorological Associations.—Bannon, Higgs, Martyn, & Munce, 3434.
- Nocturnal E-Layer Ionisation.—Bradbury, 2656.
- Townsend Coefficients for Ionisation by Collision.—Hale, 3039.
- Annual Variations in Upper-Atmospheric Ionisation, and Solar Radiation—especially Influence of Faculae on Upper-Atmospheric Ionisation.—Maeda & others, 893.
- Apparent Motion of Clouds of Abnormal E Region Ionisation.—Pierce & Mimmo, 3433.
- Noon Decrease of Ionisation in Higher Ionosphere.—Ranzi, 3435.
- Influence of Radiation on Ionisation Equilibrium.—Srivastava, 14.
- Ionisation, Ionised:** see also Absorption, Book-Review, E Region, F₂ Region, New-Zealand, Sunspot, Troposphere, Ultra-Violet, Velocity.
- Resonance Phenomena in Ionised Gases and Effect on Propagation Characteristics of Electromagnetic Waves.—Asami & Saito, 892 & 2256.
- Electrical Constants of Ionised Air for Micro-Waves.—Banerjee, 876.
- Effect of Transverse Magnetic Field on Refractive Index and Conductivity of Ionised Air at Ultra-High Frequencies.—Banerjee & Singh, 2635.
- Propagation of Signal in Rarefied Ionised Atmosphere.—Cagniard, 2255.
- Influence of Collisions on Propagation of Radio Waves in Ionised Gas.—Grafti, 2636.
- Device for Measuring Height of Ionised Regions in Upper Atmosphere.—Savelli, 3445.
- An Ionising Radiation of a Spark Discharge [Solar Radiation of This Wavelength might Penetrate to Ionosphere].—Raether, 15.
- Radio Transmission and Ionosphere [Dellinger Fade-Outs, etc.], 430.
- Data on Ionosphere (F₂ Region), 1350 & 1351.
- The Ionosphere.—Appleton, 1799.
- On Some Effects caused in Ionosphere by Electric Waves [Artificial Auroras].—Bailey, 9 & 3043.
- Stratification of Ionosphere and Origin of E₁ Layer.—Bhar, 1348.
- Ionosphere** Disturbances associated with Solar Activity.—Dellinger, Kirby, Gilliland, & Smith, 3447.
- Results of Continuous Ionospheric Recording.—Dieminger & Plendl, 1353.
- Characteristics of Ionosphere at Washington, D.C.—Gilliland, Kirby, & Smith, 26 & 2645.
- On a Case of Propagation of Radio Waves in Ionosphere.—Kessenikh, 3880.
- Effects of Ionosphere Storms on Radio Transmission.—Kirby, Smith, & Gilliland, 3448.
- Ionospheric Observations carried out in Rome: an Ionospheric Storm of Auroral Type.—Ranzi, 1808.
- Recording of Critical Frequencies of Ionosphere.—Rydbeck, 3444.
- Relation of Radio Sky-Wave Transmission to Ionosphere Measurements.—Smith, 3042.
- The Ionosphere [Outline of Short-Wave Propagation].—Tremellen, 891.
- Ionosphere:** see also Absorption, Atmosphere, Aurora, Australian, Dispersion, E Region, Eclipse, F Region, Ground, Ionisation, Ionospheric, Isotropic, Lorentz, Lunar, Magnetic, Polarisation, Propagation, Recombination, Reflection, Rome, Scattering, Shanghai, Solar, Stratified, Sunspot, Tides, Twilight, Upper, Velocity.
- On Production of Ionospheric Regions E and F and Lower-Altitude Ionisation causing Radio Fade-Outs.—Wulf & Deming, 4290.
- Studies in Propagation of Radio Waves in Isotropic Ionosphere.—Baker, 1802.
- Lecher-System:** see Wire.
- Velocity of Light Apparatus.—Anderson, 3472.
- Propagation of Light in Inhomogeneous Media.—van Cittert, 4296.
- Laboratory Analysis of Selective Absorption of Light by Sea Water.—Clarke & James, 1819.
- New Method of Measuring Velocity of Light.—Houstoun, 42.
- Absorption Coefficient of Gases for Light of Wavelength 1215.7 ÅU.—Preston, 3430.
- Path of Ray of Light Tangent to Surface of Earth.—Sweer, 40.
- Light:** see also Absorption, Combination, Diffraction, Faraday, Huyghens, Interference, Night-Sky, Nocturnal, Optical, Scattering, Sky, Solar, Sunshine, Ultra-Violet, Velocity.
- Remarks on Question of Limiting Waves.—Beckmann, Menzel, & Vilbig, 3877.
- Limiting Waves and Ionosphere.—Burkard, 418.
- Remarks on Paper by Fendler: "Variations in Transmission Conditions of a Limiting Wave (10 m)."—Burkard: Fendler, 419.
- Reflection Waves on Quasi-Homogeneous Lines.—Aguillon, 1083 & 3241.
- Propagation of H. F. Oscillations along [Line] Networks for Transport of Electrical Energy.—Carbenay, 1816.
- Attenuation of H. F. Transmissions along Power Lines.—Carbenay, 2678.
- High-Frequency Attenuation on Open-Wire Lines [and Influence of Sleet and Frost].—Curtis, 902.
- Propagation of Electric Currents in Terminated Lines: Solutions of Telegraphic Equation.—Kent, 2681.
- Methods for obtaining Travelling Waves (in a Line) without Loss of Power.—Niemann, 2679.
- Transmission-Line Calculator.—Smith, 1372.
- Analytical Study on Propagation of Electromagnetic Waves in Homogeneous [Line] Circuits.—Teszner, 1815.
- Investigation of Transmission Conditions of Overhead Lines at Frequencies of 55-1600 kc s.—Waldow, Spang, & Fritzsche, 2991.
- Lines:** see also Three-Phase.
- Long-Wave:** see Fading, Verv.
- Lorentz "Polarisation"** Correction and Behaviour of Radio Echoes from Ionosphere at Frequencies near Gyro-Frequency.—Martyn & Munro, 883.
- Lorentz Term** in Ionosphere Theory.—Ratcliffe, 2649.
- Low-Power** Transmission: Long Ranges on One Watt.—Oliver, 4287.
- The Lower Ionosphere.—Mitra, Bhar, & Ghosh, 3429.
- Lunar** Tides in Upper Atmosphere.—Appleton & Weekes, 3037.
- Luxemburg** Effects.—"Log-Roller": Bailey, 3044.
- Radio-Lyons Background ["Luxemburg Effect" Theory].—"Log-Roller": Wingrove, 3439.
- Luxemburg-Effect:** see also Interaction.
- Influence of Terrestrial Magnetic Disturbances on Round-the-Earth Echo Effect and Signal Strength at Receiving Point.—Bull, 21.

Propagation of Waves—

Origin of Earth's **Magnetic Field**.—Elsasser, 2254 & 2659.
 Mysteries of Terrestrial **Magnetism** [and the Sailing Ship *Research*].—Hallows, 3463.
 Polarisation of Radio Waves reflected from Ionised Regions formed during Terrestrial **Magnetic Disturbances and Auroras**.—Harang & Stoffregen, 3885.
 Measurement of Earth's **Magnetic Field** at High Altitudes deduced from Study of Ionosphere.—Jouaust, Thellier, & Jardy, 4291.
 American **Magnetic Character Figure C_A** in relation to Communication Problems.—McNish & Johnston, 3054.
 Earth's **Magnetism** and Upper Atmosphere.—Ramanathan, 2253.
Magnetic-(ism): see also Aurora, Fading, Ionised, Micro-Wave, Periodic, Solar.
 Study of the **Magneto-Ionic** Theory by Simple Formulae, Linkages, and Graphical Devices.—Bailey & Somerville, 11.
Magneto-Ionic: see also Ionosphere.
 American Tests with Short-Wave Signals "beamed" on Mars, for Reflected Signals explaining Long-Delay Echoes.—"Log-Roller," 3881.
Maximum Usable Frequencies for Radio Sky-Wave Transmission, 1933-1937.—Gilliland, Kirby, Smith, & Reymer, 898.
 Application of Graphs of **Maximum Usable Frequency** to Communication Problems.—Smith, Kirby, & Gilliland, 1303.
 Influences of Limiting Magnitude upon **Meteor Frequency**.—Watson, 3045.
 Rôle of **Meteorological Processes** in Radio Measurements.—Nasilov & Pogosyan, 23.
Meteorological: see also Atmosphere, Fading, Ionisation, Ozone, Solar, Weather.
 Papers on Long-Distance Communication on **Micro-Waves**.—Berline & Gutton: Michel & Gutton, 2246.
 Magnetic Permeability of Nickel for Hertzian Oscillations [**Micro-Waves**].—Lindman, 2.
Micro-Waves: see also Centimetric, Guides, Ionised, Refraction, Ultra-, Velocity.
 Radio Reception Tests in Some **Mines** in Austria.—Fritsch, 39.
 Progress on 225 Megacycles at **Mount Washington** [Behaviour of 1 m Signals over Long Paths, up to 92 Miles].—Bent, 4278.
 Effect of Collisions on the Intensities of **Nebular Lines, and Excitation of Nebular Lines**.—Menzel: Kaplan, 1811.
 Some [Medium-Frequency] Ground-Wave Field Intensity Measurements taken in **New Zealand**.—Searle, 2248.
 Preliminary Measurements of F₂-Region Ionisation [in **New Zealand**].—White & Banwell, 2651.
 Light of **Night Sky**.—Aurora Polaris, 3055: Arnulf, Bernard, 2665 (Spectrum in U-V Region); Cabannes, 1833 & 3466; C. & Dufay, Gauzit, 35 (CH and CN Bands); Déjardin, Grandmontagne, 2259 (Cyanogen Bands: Variations of Colour); Grandmontagne, 2260 (Evaluation of Brilliance); Herman, 2663 (Oxygen Phosphorescence); Kaplan, 2667 (NH Bands); Khvostikov, 2670 (Polarisation of Green Line); K. & Dobronravine, 3888 (Spectrum in U-V Region). See also Nitrogen, Nocturnal, Sodium.
Nitric Oxide in the Earth's Upper Atmosphere.—Kaplan, 3889.
Nitrogen.—Bernard, 2666 (Presence of N. Forbidden Line in Auroral Spectrum) & 3465 (Selective Excitation of Bands of N. Molecule by Metastable Atoms); Déjardin, 1812 (Luminous Discharge in N. in Presence of Sodium Chloride); Duffendack & Chao, 4289 (Temperature Parameters from Negative Bands of N. under Excitation by Electron Impact); Gauzit, 34 (Probable Dissociation of N. Molecules in High Atmosphere); Holtz & Müller, 2261 (Combination of N. & Oxygen in Glow Discharge); Kaplan, 36, 1810, 2668, & 3464 (N. Lines in Aurora. Forbidden Transitions, etc.); McNeill & Harvey, 37 (N. Afterglows); Nicolet, 900 (Atomic N. in Upper Atmosphere) & 2664 (Excitation Mechanism in Aurora & Night Sky); Wulf & Melvin, 2669 (Band Spectra: Source of Excitation).
Nitrogen: see also Dellinger, Nebular, Night-Sky, Nitric-Oxide, Townsend.
 Variations of Effective **Nocturnal Radiation**, during Clear Nights.—Debrach, 3056.
Nocturnal: see also Ionisation, Lower, Night.
 Correction to "Measurement of the **Optical Constants** of Very Thin Metal Films."—Forsterling, 904.
 Calculating **Optical Constants** from Reflection Coefficients.—Tousey, 3477.
 On the Theory of the **Optical Grating**.—Ignatowsky, 2685.
Optical Thickness of the Transition Layer between Transparent Media.—Bruce, 3060.
Optical: see also Light, Optics, Spherical.
 Report on Limits between which Approximate Methods of **Geometrical Optics** are Valid in Wave Optics, with Application to Radioelectric Waves.—Manneback, 4295.
Oxygen: see Night Sky, Nitrogen.
Ozone.—Barbier & Chalonge, 3467 (Researches: "Ozone Clouds"); Coblentz & Stair, 2672 & 3059 (Distribution in Stratosphere); Hamilton, 2674 (in Upper Atmosphere); Khvostikov & Ershova, 2671 (Instability of O₂ Layer at Sunrise & Sunset); Reynolds; Paneth & Edgar, 28 (Measurement of Atmospheric O₂); Strong, 3470 (Observations with New Radiation Pyrometer); Vassy, 899

(Daily Variation of Mean Temperature), 3057 (Influence of Solar Radiation on Mean Temperature), 3468/9 (Papers on Mean Temperature Variations, Relations to Layer Thickness, Meteorological Situation, etc.) See also Stratosphere, Temperature.
 New **Periodic Orbit** in Field of a Magnetic Dipole.—Hutner, 1371.
Phase: see Anomalous, Spherical.
Polar: see Scattering.
 Limiting **Polarisation** of Medium Waves Reflected from Ionosphere.—Eckersley & Millington, 888.
Polarisation: see also Magnetic.
 The Highest Eruptive **Prominences**.—Pettit, 433.
 Report of Committee on Radio Wave **Propagation** [C.C.I.R., Bucharest, 1937], 27.
Propagation of Wave-Packets Incident Obliquely upon a Stratified Doubly-Refraction Ionosphere.—Booker, 422.
 The **Propagation** of Electromagnetic Waves.—David, 2251.
 Report of Commission II: Radio Wave **Propagation**.—Dellinger, 4299.
 Radio Progress during 1938: Part VI—Wave **Propagation**.—I.R.E. Committee, 2644.
 Interference Method for Investigation of **Propagation** of Electromagnetic Waves, and Associated Papers.—Mandelstam: Papalex: Schegolev, 3033.
 Further Note on **Propagation** of Radio Waves over Finitely Conducting Spherical Earth.—van der Pol & Bremmer, 2249.
Propagation and Total Reflection of Electromagnetic Waves in Ionosphere.—Saha & Mathur, 3036.
 Report to Commission II on Investigations of **Propagation** of Waves in Great Britain, 1934 to 1938.—Smith-Rose, 2643.
 Approximate Solution of Wave **Propagation** Formula in Ionosphere.—Tukada, 4297.
Propagation: see also Anomalous, Diffraction, Discharge, Explosion, Field-Strength, Geometrical, Ground, Guides, Hamilton, Ionised, Ionosphere, Isotropic, Light, Line, Magneto-Ionic, Max-Usable, Mines, Optical, Optics, Scattered, Seismic, Short-Wave, Spherical, Transmission, Ultra-, Velocity, Very-Long, Water, Wave, Wire.
 Contribution to Foundations of Radio Mining **Prospecting** by "Antenna Equivalent - Capacity" Method.—Fritsch & Wiechowski, 3017.
 Radio Observations in **Puerto Rico**.—Kenrick, 3029.
 Propagation of a [Surface] **Pulse** in the Atmosphere.—Pekeris, 3906.
 Some Contributions of **Radio** to Other Sciences.—Dellinger, 3891.
Range: see Aircraft.
Recombination in Ionosphere.—Appleton & Sayers, 3432.
 Ionic **Recombination** in Air.—Sayers, 883.
Recombination: see also Upper-Atmosphere.
 56-Megacycle Reception via Sporadic E-Layer **Reflections**.—Conklin, 1343.
Reflection and Absorption of Electromagnetic Waves by Dielectric Strata.—G. W. O. H., 415.
 Direct Observation of Rayleigh Waves in Case of Total **Reflection**.—Kretschmer & Rschewkin, 1369.
 Question of Partial **Reflection** and Calculation of Apparent Height of Ionospheric Regions.—Rauer, 3035.
 A Phase Jump of 2π in Metallic **Reflection**.—Rouard, 2682.
Reflection Coefficients of Heavyside Layer in Wave Band from 200 to 2000 m for Various Departure Angles.—Vilbig, 887.
Reflection: see also Centimetric, Decimetric, Gratings, Lines, Magnetic, Propagation, Scattered, Scattering, Spherical, Troposphere, Ultra-High, Very-Long.
 How Ultra-Short Waves surmount Earth's Curvature by Ray **Refraction** in Atmosphere.—Eckart & Plendl, 4.
 Double **Refraction** of Electric Waves in Oak.—Lindman, 2244.
Refraction of Plane Electromagnetic Waves at Plane Surface of Separation between Air and Earth.—Wundt & Cordsmeier, 4301.
Refraction: see also Diffraction.
 Electric **Resonance Chambers**.—Reber, 1340.
Resonance: see also Ionised.
 High-Frequency Characteristics of **Rocks**.—Kadowaki, 4302.
 Ionospheric Station of National Geophysical Institute in **Rome**.—Ranzi, 25.
 Scattered Reflections of Radio Waves from more than 1000 km.—Harang & Stoffregen, 13.
 Scattered Propagation of Short Waves around 30 Mc/s.—Ohno, Nakagami, & Miya, 4284.
Scattering of Radio Waves in Polar Regions.—Appleton & Naismith, 1798.
Scattering Reflections at Ionosphere.—Beckmann, Meizel, & Vilbig, 2850.
Scattering of Wireless Waves in Ionosphere.—Eckersley, 1352.
 Primary and Secondary **Scattering** of Sunlight in Plane-Stratified Atmosphere of Uniform Composition.—Hamnad & Chapman, 3456.
 Electromagnetic **Screens**.—Latmiral, 2632.
 Periodic Analysis of **Seismic** Waves, and Problems connected Therewith.—Caloi, 2688.
 [Seismic] Boundary Waves at a Surface of Discontinuity.—Sezawa & Kanai, 434.

Propagation of Waves—

Seismic : see also Pulse.

Seismology from a Mathematical View-Point.—Cairns, 1818.

Study of Ionosphere at **Shanghai** : Observation of Frequency Changes of Waves Reflected by Ionised Layers.—Lejay, 1801.

Propagation Characteristics of High-Frequency [10-20 Mc/s] Radio Waves over **Short Distances**.—Maeda, Yokoyama, & Takeda, 4286.

New Data on Direction of [Short-] Wave Propagation.—Feldman, 423 & 556.

Calculation of Field Strength on **Short Waves**, taking into Account the Directivity of Transmitting Aerials in Vertical Plane.—Dolukhanov, 3440.

Short Waves : see also Amateur, Aurora, Cosmic, Decametric, Dangling, Fading, Ionosphere, Low-Power, Scattered, Short-Distances, Skip, Solar, Sunspot, Troposphere.

Skip Distance of 14 Mc/s Waves appears Greater in U.S.A. than in England.—“Log-Roller”, 425.

Numerical Calculation of Brightness of Clear **Sky**.—Gruner & Klee, 1362.

Observations on **Sky-Wave** Transmission on Frequencies above 40 Megacycles.—Goddard, 1344 & 1793.

Characteristics of **Sky-Wave** Transmission : Transmission Effects of Practical Interest to the Amateur.—Selvidge, 424.

Sky-Wave : see also Max. Usable Frequencies.

The Presence of **Sodium** in the Atmosphere on Basis of Investigations of Light of Evening and Night Sky.—Bernard, 33.

Theoretical Interpretation of Variation of Electrical Constants of Soil with Moisture Content, Temperature, and Frequency.—Joshi, 38.

Solar Variation and Weather (23-Year Cycle).—Abbot, 2654.

Solar Activity and Influence on Earth.—Abetti, 2662.

Radio Transmission and **Solar Activity**.—Appleton, 17.

Disturbances of Wireless Propagation and Appearance of **Solar Eruptions**.—Beckmann, 4311.

Atmospheric Height Distribution of Band-Absorbed **Solar Radiation**.—Chapman, 880.

Time Interval between **Solar Eruptions** and Magnetic Storms.—Coulomb & Dugast, 3053.

Recent Development of Researches on **Solar Eruptions** and Their Relations to Ionospheric Perturbations.—d'Azambuja, 3452.

F₂ Region as Indicating Mechanism for **Solar Activity**.—Goodall, 3437.

Remarks on Relations between **Solar Phenomena** and Propagation of Waves.—Jouast, 4307.

Proof of Existence of **Solar Radiation** of Wavelength about 2150 AU.—Kiepenheuer, 16.

Anomaly of **Solar Period** 1923-1933.—Mémery, 2252.

Refinements in Atmospheric Transmission Measurement for **Solar Constant Determination**.—O'Brien, 3890.

Solar Control of Atmosphere.—Saha, 2655.

Eleven-Year Cycle of **Solar Activity** and Choice of Optimum Wavelengths for Short-Wave Radio.—Shechukina, 19.

Solar Effects on Radio Reception at Broadcast Frequencies.—Stetson, 4308.

Solar Eruptions and Influence on Propagation of Electromagnetic Waves and Structure of Sunspots.—Waldmeier, 1356.

Solar : see also Book-Review, Cosmic, Eclipse, Fade-Out, Fading, Hydrogen, Ionisation, Light, Prominences, Sunspot, Ultra-Violet.

Spark-Discharge : see Ionising.

Phase Anomaly of Optical Waves, in particular of **Spherical Waves**.—Breuninger, 3896.

Propagation of **Spherical** [Elastic] Waves.—Lecornu, 2687.

Transmission Theory of **Spherical Waves**.—Schelkunoff, 2247.

Spherical : see also Waves.

Stratification : see Ionosphere, Stratified.

Electrical Waves in **Stratified Medium** : Question of Partial Reflection and Calculation of Apparent Height of Ionospheric Layers.—Rawer, 3879.

Papers on Radio Soundings of the **Stratosphere**, 2639.

Complex Structure of Lower **Stratosphere**.—Mironovitch & Viant, 421.

New Experimental Proof of Increase of Temperature in Upper Regions of **Stratosphere**.—Vassy, 3058.

Temperature of **Stratosphere** in High Latitudes.—Vassy, 4288.

Stratosphere : see also Ozone, Troposphere.

Tests on Radiocommunication with Submerged **Submarines**.—Houtsmuller, 4227.

Components of Annual Fluctuation of Hours of **Sunshine**.—Conrad, 1361.

Sunspots.—Anderson, 3051 (A Representation of the S. Cycle) ; Appleton & Naisnith, 1354 & 3050 (Solar Radiation Changes during S. Cycle) ; Babcock, 432 & 896 (Recent Observations of S. Spectra) ; Bennington, 3453 (Long-Period Effects in Short-Wave Communication) ; Clayton, 3455 & 4306 (89-Year Cycle) ; Mohler, 4305 (Ionisation & S. Numbers) ; Smith, Gilliland, & Kirby, 1355, 2661, & 3052 (Characteristics through Half a S. Cycle) ; Spencer-Jones, 1805 (S. & Terrestrial Effects) ; Stewart & Eggleston, 3454 (Prediction of Remaining Course of S. Cycle) ; Current Sunspots, 18, 431, 897, 2660 & 3887. See also Ionisation, Magnetic, Short-Wave, Solar.

The Propagation of Ultra-Short Waves in **Switzerland**.—Tank & Gerber, 1792.

Nocturnal **Temperature** of Upper Atmospheric Layers.—Barbier & Chalonge, 2673.

Distribution of **Temperature** and Humidity in Upper Air over Karachi.—Rao & Bhatia, 1814.

Temperature : see also Nitrogen, Ozone, Stratosphere.

H.F. Telephony along **Three-Phase Power Lines**.—Carbenay, 2262.

Tides in the Upper Atmosphere.—Appleton & Weekes, 2648.

Tides : see also Lunar.

Comment on Paper by Bowls, “Second Townsend Coefficient”.—Kaplan, 1358.

Transition : see Optical.

Report on Relation between Registered Theory of **Transmission**.—Eckersley, 4294.

Reflection of Medium and Short Radio Waves in **Troposphere**.—Colwell & Friend, 3423.

Tropospheric Reflections of Radio Waves.—Colwell & Friend, 3034.

Non-Existence of Continuous Intense Ionisation in **Troposphere** and Lower Stratosphere.—Gish & Booker, 1800.

Ionisation Measurements in **Troposphere**.—Jullis, 884.

Origin of Radio-Wave Reflections in **Troposphere**.—Piddington, 882 & 2638.

Influence of **Troposphere** on Ultra-Short-Wave Propagation.—Scholz & Egersdorfer, 2634.

Ionisation in **Troposphere**.—Ziemcecki, 3427.

Use of Waves in **Tubes** as Transmission Channels.—Schriever, 4276.

Ionosphere during Morning **Twilight**.—Hulburt, 4300.

Investigation of Propagation of Electromagnetic Waves for an **Ultra-High** Frequency of 120 Megacycles/Second.—Bussmann, 1341.

Ultra-High-Frequency Transmission along Cylindrical Conductors and Non-Conductors.—Droste, 874.

Ultra-Short-Wave Transmission and Atmospheric Irregularities.—England, Crawford, & Mumford, 417.

Ultra-Short-Wave Ranges in Summers of 1938 and 1937.—Fendler, 4283.

A Study of **Ultra-High-Frequency** Wide-Band Propagation Characteristics.—George, 1346.

Field Strength Measuring Equipment for Wide-Band **Ultra-High-Frequency** Transmission.—George, 3262.

Unusual Ranges in Wireless Propagation [of **Ultra-Short Waves**].—Hess, 3030.

Attenuation of **Ultra-Short** Radio Waves along Earth.—Khashtgir & Chakravarty, 1342.

Paper on **Ultra-Short-Wave** Links on Mountains, depending on Diffraction, Reflection, and a Combination of Both.—Loeb, 3359.

Experimental Investigations on Propagation of **Ultra-Short Waves**.—Ochmann & Plendl, 3.

Measurements on Propagation of **Ultra-Short Waves** over Water.—Potapenko & Epstein, 1791.

Weakening of Electromagnetic Fields of **Ultra-Short Waves** on Crossing Rivers.—Rocard, 877.

Propagation Phenomena of **Ultra-Short Waves**.—Schwarz, 6.

Aspects of Propagation of **Ultra-Short Waves**.—Smith-Rose, 3637.

Ultra-Short-Wave Propagation : Comparison between Theory and Experimental Data.—Smith-Rose & Stickland, 1790.

Ultra-High & -Short : see also Amateur, Aurora, Diffraction, Dispersion, Distances, Eckersley, Fading, Field-Strength, Guides, Ionised, Light, Limiting, Micro-Wave, Mount Washington, Puerto Rico, Reflection, Refraction, Scattered, Sky-Wave, Switzerland, Troposphere, Velocity, Water, Weather.

Ultra-Violet End of Solar Spectrum.—Chiplonkar, 4304.

Integrating Meters for **Ultra-Violet Radiation**.—Kuper & Brackett, 3458.

Effect peculiar to Gases subjected to Action of **Ultra-Violet Light**.—Reboul, 3431.

Ultra-Violet : see also Sunspot.

Dissociation, Recombination, and Attachment Processes in **Upper Atmosphere**.—Bates, Buckingham, Massey, & Unwin, 428 & 3038.

Composition and Temperature of **Upper Atmosphere**.—Paneth & others, 3443.

Upper-Atmosphere : see also Ionosphere, Nitrogen, Temperature, Tides.

Opening Address by President of **U.R.S.I.**—Appleton, 4293.

Velocity of Radio Waves in Air.—Brown, 3422.

Velocity of Propagation of Micro-Waves in Neighbourhood of Earth's Surface.—Lo Surlo & Zanotelli, 1.

Phase, Energy, and Group **Velocities** in Ionised Medium.—van Mieghem, 3438.

Measurement of **Velocity** of Propagation of Micro-Waves.—Savelli, 3423.

Velocity of Radio Waves in Air.—Vitter & Brieger, 2633.

Velocity : see also Light, Propagation.

Velocity Distribution of Electrons subject to Elastic Collisions in Gas whose Molecules are Moving according to Temperature.—Lichtenstein, 8.

Propagation of Waves—

Propagation of **Very Long Waves** over Short Distances.—Bouvier, 3442.
 Further Investigations of **Very Long Waves** reflected from Ionosphere.—Budden, Ratcliffe, & Wilkes, 428 & 3441.
 Reflection of **Very Long Wireless Waves** from Ionosphere.—Wilkes, 3884.
 Postscript to Paper "Propagation of Electromagnetic Waves in Water."—Brüne, 1795.
 Dispersion of **Water** for Electromagnetic Waves.—Skolik, 3025.
Water: see also Light, Submarines, Ultra-High.
 Papers on the Cauchy Problem for Equation of **Waves**.—Agostinelli: Frola, 3474.
 Birth of **Conical-Front Waves** from Total Reflection of a Spherical Wave.—Cagniard, 3475.
 Elementary **Spherical Waves** with Rectilinear Polarisation.—Foix, 3473.
 Problem of **Wave-Motion** for Sub-Infinite Domains.—Lowan, 1367 & 3061.
 Some Phenomena of **Wave Propagation** [Propagation of Elastic Waves in Polar Crystals].—Parodi, 3476.
Waves: see also Book-Review, Light, Propagation, Spherical, Transmission.
 Five-Metre Signals and the **Weather**.—Heightman: Ratcliffe & Waynick, 3876 & 4282.
Weather Conditions and Radio Reception at Long Distances.—Joshi, 131.
 On Electric Waves in **Single-Wire** and **Parallel-Wire** Systems: Permeability of Iron and Nickel.—Lindman, 3026.
Wave Propagation along **Wires** [Lecher System].—Placinteanu, 3424.
Wires: see also Dielectric, Line.

ATMOSPHERIC AND ATMOSPHERIC ELECTRICITY

Ionisation of **Air** in Air-Conditioned Building.—Béhounek & Kletschka, 440.
 Application of Clay's New Value of Jaffé-Zanstra Coefficient for **Air** to High-Pressure Ion-Current Measurements.—Broxon & Merideth, 443.
 Measurements of Conductivity and Ionisation of **Air** in Alps.—Moussié, 1379.
 A Peculiarity of **Air** Ionised by X-Rays.—Reboul & Perrier, 1381.
 Ionic Recombination in **Air**.—Sayers, 53.
 Electric Strength of **Air** at High Frequencies.—Seward, 1377.
 Diurnal Variations of Conductivity, Vertical Electric Current, Ionic Mobility, and Space Charge of **Air**.—Thellier, 2275 & 3494.
Aircraft Static Suppressor installed on United Air Lines Ships, 1821.
 Precipitation-Static Interference on **Aircraft** and at Ground Stations.—Hucke, 3065.
 New Cartridge Static Suppressor [for **Air-Liners**].—Engel, 43.
 Mobility of **Alkali** Ions in Gases.—Munson, Tyndall, Heselitz, 3493.
 Integrating **Altimeter** for Aerological Soundings.—Lugeon, 2703.
 Instantaneous Determination of Every **Altitude** of a Radio Sounding Balloon.—Lugeon, 1829.
 Testing and Application of **Lightning Arresters**.—AIEE, 1823.
 Marconi Split-Gap Horn **Arresters**.—Wells, 2273.
Atmosphere: see Radiative-Equilibrium, Soundings.
 Radioelectric **Atmospherics**.—Bureau, 1820.
 Report on Recording of **Atmospherics**.—Bureau, 3480.
Atmospherics in Southern Regions.—Bureau & Douquet, 3899.
 Field-Strengths of **Atmospheric Parasites** at Calcutta on Wave-lengths 10 to 500 Metres.—Chakravarti, 2265.
 Wave-Form of **Atmospherics** at Calcutta.—Chakravarti, 3064.
 Research on **Atmospherics** in Italy.—Hardi, 2689.
 Wave Form, Energy, and Reflection by Ionospheres of **Atmospherics**.—Laby, McNeill, & others, 3898.
 Nature of **Atmospherics**: VI.—Lutkin, 908 & 3062.
 Intensity and Spectral Distribution of **Atmospheric Disturbances**, and Relations to Other Geophysical and Cosmic Phenomena.—Marcard, 2267.
Atmospheric Disturbances.—Morgenroth, 2266.
 Researches on Origin of **Atmospherics**: Report to Sub-Commission.—Norinder, 3481.
 Radio-**Atmospheric** Researches [Perugia Observations].—Paoloni, 3479.
 Peak Field Strengths of **Atmospherics** due to Local Thunderstorms at 150 Megacycles.—Schafer & Goodall, 2688.
 Report to Commission III on British Work on **Atmospherics**, 1934/38, and Report of Sub-Commission 4: Direction-Finding on **Atmospherics**.—Watson Watt, 4317.
Atmospherics: see also Australian, Electric, Electrical, Radioactive, Reflection, Static (ally), Tweaks.
Aurora: see Electric Field, and under "Propagation of Waves."
 Australian Radio Research Board, Annual Report: Work on **Atmospherics**, 909.
Ball-Lighting: see Lightning, Photoflash, Weather.
Balloon Transmitters.—Hunter, 920.
Barometric-Pressure: see Atmospheric.
 "Physical and Dynamical Meteorology: Second Edition" [Book Review].—Bruni, 3496.

"Prévision du Temps par l'Analyse des Cartes météorologiques" [Book Review].—van Mieghem, 921.
 "Année polaire internationale 1932/1933: Participation française, Tome II" [Book Review], 435.
 Variation in **Breakdown Voltage** of Molecular Gases due to Irradiation.—Fucks & Schumacher, 3902.
 Scattering Time and Probability in Impulsive **Breakdowns**.—Müller-Strobel, 917.
 Progressive **Breakdown** in a Conducting Liquid.—Snoddy & Beams, 3068.
Breakdown: see also Discharge, and under "Subsidiary Apparatus & Materials."
 Influence of Temperature on Production and Recombination of **Carriers** in Alpha Ray Columns.—Seitter, 1382.
 Spatial Distribution of Clouds of **Carriers** produced in Ionisation of Air by X-Rays.—Kustner, 3904.
 Recording of Transient Phenomena by **Cathode-Ray Oscillograph**.—Vogel, 916.
 Charging Phenomena of Communication Lines by "Dust Wind" in Manchukuo.—Kano & others, 2268.
 Specific Ionisation Measurements and Sign Preference for **Condensation** in Wilson Cloud Chamber.—Brode & Bagley, 4322.
Condensation of Supersaturated Vapours on Ions.—Scharrer, 4323.
 Disintegration of Atomic Nuclei by **Cosmic Rays**.—Filippov & others, 4324.
 Stability in Sense of Poisson for Orbits of **Cosmic Rays**, and Magnetic Storms.—Godart, 3076.
 Geomagnetic Effects and Bearing upon Fundamental Problems of **Cosmic Ray Investigation**.—Johnson, 2695.
 Present State of Theory of Effect of Earth's Magnetic Field on **Cosmic Rays**.—Vallarta & others, 2696.
Cosmic Rays, Papers on: Baños, 3498 (Fundamental Principles—Motion of Charged Particle in Magnetic-Dipole Field); Bernardini, 444 (Systematic Recording at Rome); Clay & Bruins, 3499 (Variations with Temperature and Pressure); Clay & Stanmer, 3499 (Ionisation by C.R. in Gases); Sabato, 3497 (Objections to Alfvén's "Cosmic Cyclotron" Theory); Schönberg, 444 (Multiplicative Processes of C.R. in Upper Atmosphere); Zwicky, 3905 (Production of Atomic Rays and C.R. in Supernovae).
 Electromagnetic Induction in Non-Uniform Conductors, and Determination of **Conductivity** of Earth from Terrestrial Magnetic Variations.—Lahiri & Price, 1832.
Conductivity: see also Air.
 Onset and Breakdown Potentials in Point-to-Plane **Corona** Discharge in Air.—Hudson, 3490.
 Onset Studies of Positive **Point-to-Plane Corona** in Air.—Kip, 2694.
 Negative **Point-to-Plane Corona** Studies.—Kip, 3489.
 Mechanism of Positive **Point-to-Plane Corona** in Air.—Trichel, 2693.
Corona: see also Discharge.
 Origin of H.F. Noise during **Dellinger** Effects.—Nakagami & Miya, 4318.
 Point **Discharges** in Air at Pressures from 1 to 30 Atm.—Baer, 47.
 Drop in Striking Voltage of Electrical **Discharge** due to Ionisation by an External Source, etc.—Brinkmann, 2271.
 Cloud Chamber Studies of Positive **Point-to-Plane Discharge** in Air at Atmospheric Pressure.—Gorill, 3488.
 Electrical **Discharges** in Air at Atmospheric Pressure: Nature of **Point-to-Plane Coronas** and Mechanism of Spark Propagation.—Loeb & Kip, 1825.
 Starting Process of Electrical **Discharge** at Atmospheric Pressure.—Schade, 1824.
Discharges: see also Breakdowns, Corona, Electroconvective, Lichtenberg, Lightning, Spark.
Divining-Rod: see Lightning.
Double-Layer: see Interchange.
Droplets: see Electric Charges.
Dust-Wind: see Charging.
 Earth Connections submitted to Steep-Fronted Waves.—Cuihé, 3071.
Earths: see also Protective.
 Earth's Charge and Its Permanence.—Petrucci, 3495.
 Observations of **Earth Current** in Submarine Cable.—Bernard, 911.
 Determination of **Electrical Charges** in Atmosphere.—Medi, 1827.
 Transport of **Electric Charges** by Droplets.—Moreau-Hanot, 3304.
Electric-Charge: see also Hail.
 Earth's **Electric Field** and Aurorae.—Holmes, 3886.
 Observations of **Electric Field** of Atmosphere at Sea.—Rouch, 52.
 Effects of Thunderstorms and Lightning Discharges on Earth's **Electric Field**.—Wormell, 51.
 Cellular and Banded **Electroconvective** Edlies in Gases.—Lutz, 3491.
 Development of **Electron Avalanche** in Spark Channel.—Raether, 3069.
Gamma-Ray Ion Currents in Air at High Pressures and High Gradients at High and Low Temperatures.—Broxon & Merideth, 3075.
 Electric Charge on Soft **Hail**.—Chalmers & Little, 1828.
 Integrator for Polar, Rectangular, and Curvilinear Co-ordinates.—Lugeon, 3500.

Atmospherics and Atmospheric Electricity—

Interchange of Electricity between Solids, Liquids, and Gases in Mechanical Actions.—Banerji, 3492.

Ion-Clouds, Currents: see Discharge, Gamma-Rays.

Ionic Recombination in Air, and Ionisation Measurements in Troposphere.—Sayers: Julifs, 918.

Ionisation: see also Air, Carriers, Cosmic-Rays.

Sign Preference in Cloud Condensation on Gaseous Ions.—Beckman & Loeb, 441.

Determination of Mobilities of Gaseous Ions.—Montel, 2276.

Ions: see also Air, Carriers, Large, Small.

New Theory of Lapse-Rate.—Subrahmanyam, 3072.

Large-Ion Counter giving directly Mobility Spectrum.—Queney, 3074.

Formation of Large Ions in Gases as Function of Magnitude of Particles in Suspension.—Te-Tchao, 1380.

Atomophysical Interpretation of "Lichtenberg Figures" and Their Application for studying Electric Discharge Phenomena.—Merrill & von Hippel, 3483.

Lightning.—L. Flashes & H.T. Mains, 4319; Bellaschi, 4321 ("Hot" L, and Recent Studies in Field & Laboratory); Collens, 49 (Photographic Recording); C. Malan, & Schonland, 44 (Progressive L.); Dauzère, 912 & 1376 (Points struck by L.); D. & Bouget, 3485 (Distribution of L. Strokes & Hail Storms); Bie, 438 (L. Current Measurements); Fritsch, 913 (L. Nests & Divining Rod); Garreau, 3486 (Ball L.); Matthias & Burkhardtmaier, 3487 (Protection Zone of L. Conductors); McEachron, 437 & 2269 (L. to Empire State Building); Meek, 3067 & 3484 (Mechanism of L. Discharge); Morel, 1822 (L. & Interior Elec. Installations); Rich, 4320 (Paris H.T. Conference: Researches with Models); Schonland, 45 (Reliability of Magnetic Method); S. Malan, & Collens, 436 (Progressive L.); Wagner & McCann, 3901 (Measuring Current in L. Bolts); Walter, 3900 (Origin of Path); Workman & Holzer, 2690 (Quantities of Charge Transfers) & 3691 (Recording Generating Voltmeter). See also Arrester, Discharge, Electric-Field, Interchange, Protective, Spark, Storms, Surge, Thunderstorm, Weather.

Magnetic: see Conductivity (of Earth), Cosmic.

Meteorograph: see Soundings, Weather.

Mobility: see also Alkali, Ions.

Nucleus Formation under Influence of Electric Charges.—Tohnfor & Volmer: Glosios, 919 & 2274.

Visual Image Produced by Photoflash Bulb.—Ives, 48.

Point-Discharges: see Corona, Discharges.

Study on [Protective] Earth Connections.—Demogue, 922.

Meter and Instrument Section: Chairman's Address [Protective Devices].—Cohen, 1378.

Propagation of [Surface] Pulse in Atmosphere.—Pekeris, 3906.

Radiative Equilibrium of Earth's Atmosphere.—Lebedinsky, 3073.

Radioactive Content of Atmosphere as Affected by Condensation Nuclei.—Wait, 2698.

Improved Radio-Barograph.—Johnson & Korit, 2278.

Improved Radio-Meteorograph on Olland Principle.—Curtiss & others, 1830.

Method for Investigation of Upper-Air Phenomena, and Application to Radio-Meteorography.—Diamond, Hinman, & Dunmore, 58.

U.S. Weather Bureau re-names the Radiometerograph [in future, "Radio-Sonde"], 1831.

Radio Meteorology in the United States: the Radio-Telemeter and Its Importance to Aviation.—Knight, 2702.

Reflection of Atmospherics from Ionosphere.—Schonland, Elder, & others, 3063.

Coefficient of Absorption of Small Ions by Neutral Particles in Suspension in Air.—Te-Tchao & Le Boiteux, 2697.

Daily Exploration of Atmosphere by Radio Soundings: Its Development on Land and Sea.—Bourgeois, 56.

Radio Soundings in Southern Seas.—Bureau, Douguet, & Wehrli, 2701.

Radio Soundings and Weather Prediction.—Diamond & others, 2700.

Soundings: see also Altimeter, Altitude, Balloon, Radio-Barograph, Radio-Meteorograph, Radio-Sonde, Radio-Telemeter, Temperature, Ultra-Violet, Weather.

Mechanism of the Long Spark.—Allibone, 439 & 2272.

Development of Spark Discharge.—Allibone & Meek, 46 & 914.

Influence of Air Density according to New I.E.C. Mean Values for Spark Gaps between Spheres.—Franck, 1826.

Spark Discharge on Surfaces.—Snoddy & Beams, 2692.

Light Impulse of Spark and Lowering of Spark Voltage Thereby.—Toepfer, 915. Cf. 2270.

Sparks: see also Air, Breakdown, Discharge, Striking.

Spark-Channel: see Electron-Avalanche.

Location of Tropical Disturbances by Means of Associated Static.—Bernard, 1373.

Fluctuations in Intensity of Static.—Kenrick & Sammon, 4316.

Static: see also Air-Liners, Aircraft, Atmospherics, Charging, Earth-Current, Statically, Storms, Tweeks.

Static Charges from Aircraft Engine Exhaust Gases.—Klumb, 3122.

Statically Charged Rain: Occasional Effect on Reception where "Skyrod" Type of Aerial is used.—Belling & Lee, Ltd., 3482.

Guarding against Storms, 54.

Increase of Striking Distance by Radiation Impact, and Brightness of "Impact" Sparks.—Toepfer, 2270. Cf. 915.

Submarine-Cables: see Earth-Current.

Experiments with Large Surge Currents.—Foitzik, 1374.

Discussion on "New Method of Sensitive Temperature and Pressure Measurements."—Zamenhof, 2704.

Russian Measurements on Thunderstorms.—Stekolnikov & Waleev, 50.

Thunderstorms: see also Electric-Field, Lightning, Storms.

Transients: see Cathode-Ray.

Tropical-Disturbances: see Static.

Occurrence of "Tweeks" on a Telephone Line.—Chase, 910.

Stratosphere Ultra-Violet Meter.—Stair, 2277 & 2699.

Symposium on Weather Prediction, 55.

New Mechanical Weather Observer replaces Airplanes at Six Stations, 57.

Progress in Weather Forecasting.—Gregg, 442.

Weather of Colorado Rockies.—Ives, 1375.

Weather: see also Soundings.

PROPERTIES OF CIRCUITS

Amplifier-Equaliser of Bridged-Feedback Type.—Kobayashi, 2286.

New Method of Connection of Multi-Grid Valve for D.C. Amplification.—Boucke, 445.

Grid-Blocking in RC Amplifiers, 4349.

Amplifiers: Negative Feedback in R-C Amplifiers, 85; Bartels, 3914 (Input Impedance of As. with Retroaction); Bedford & Fredendall, 3078 (Transient Response of Multi-Stage As.); Benham, 59 & 1388 (Contribution to Tube & A. Theory); Boella, 3087 (Oscillatory Circuit in Transmitter As.); Bruck, 1834 (Frequency Curve & Oscillation-Tendency of Neg. Feedback As.); Cook, 3503 (Low-Distortion Limiting A.); Fairweather & Williams, Cramp, 1387 & 1841 ("Variable-Q" Amplifier); Feldtkeller, 932 (Anode Choke in Push-Pull A.); Forsman, 3086 (Resolving Power); Gen. Radio, Scott, 2723 (Degenerative A. Applications); Ginzton, 927 (Balanced-Feedback As.); Istituto G. Ferraris, 2724 (R.F. Power As.); Jofeh, 4343 (Operational Treatment of Time-Base As.); Mader, 3913 (Reduction of Klirr Factor); Mayer, 2721 (Control of Effective Impedance by Feedback); Pevtsov, 931 (Logarithmic A.); Pfefferl, 1386 (Television As. with Negative Feedback); Pitsch, 462 (Calculation of R-C coupled As. by Current-Source Equiv. Diagram) & 4345 (Lower Frequency Limit); Ramo, 4344 (A. Band-Width: Similitude Principles); Schienemann, 1839 (Wide-Band A. with Mutually Detuned Single Circuits); Simada & Aono, 2287 (Transient Phenomena in Rectified-Feedback A.); Terman & Parr, 2722 (Frequency-Response Characteristic of As. with Neg. Feedback); Watanabe & Okamura, 4347 (Study of Feedback As. by Their Equivalent Circuits); Watson, 3088 (Relaxed As.); Wheeler, 3517 (Wide-Band As. for Television); Williams & Chester, 2720 & 4346 (Input Impedance of Self-Biased As.). See also Cathode-Coupled, Reciprocal, Resistance (Cold), Tensor, Amplitude Filters and Their Use in Telephone Installations.—Benz, 2282.

Two Systems of Electro-Mechanical Analogies from Point of View of Lagrange Equation.—Teodorchik, 2291.

Attenuation: see Filter, Quadripole.

Modulation Range of Audion.—Oertel, 3097.

Correction to "Frequency and Stability of Auto-Oscillations."—Shemmel, 61.

Graphical Treatment of Back-Coupled Circuits, 3504.

Barrier-Layer: see Crystal.

Distortions in the Beat Oscillator: Functioning of Self-Excited Oscillator synchronised Outside the Region of Synchronisation—Jelonek, 62.

"Collected Papers of George Ashley Campbell" [Book Review], 461.

"Hochfrequenztechnik: I" [Book Review].—Kammerloher, 2718.

Book Reviews: see also Filter, Noise, Tensor, and under "Miscellaneous."

Bridge: see also Grid, Networks, Neutralising.

Brownian Motion in Electric Resistances.—Bakker & Heller, 1842.

Production of Quartz Resonators for London/Birmingham Coaxial Cable System, and Channel Filters employing Crystal Resonators.—Booth & Sayers: Stanesby & Broad, 1390 & 3513.

The Evaluation of Open- and Closed-Circuit Measurements on Homogeneous Cables.—Sommer, 3910.

Cables: see also Coaxial, Lines.

Capacity: see Variable.

Cathode-Coupled Circuits: Their Peculiarities and Applications.—Cocking, 464.

Chokon, a New Radio Part.—Iinuma, 924.

Coaxial: see also Cables, Filters, Noise.

Influence of Self-Inductance of Roll-Type Condensers on Their Impedance.—Linder & Schmiedemann, 4330.

Condenser-Lead Resonance Chart.—Haskins, 4331.

Coupled Self-Excited Electrical Circuits and Crystal Oscillators.—Heegner, 1837.

Properties of Circuits—

- Oscillation of Close-Coupled Circuits.—Ramsey, Chenault, & Long, 1838.
- Coupling** Oscillations in Mechanical and Electrical Systems.—Awender & Lange, 72.
- Coupling Networks**.—Everitt, 74 & 456.
- Coupling of an Oscillating Circuit with a Geissler Tube**.—Jonescu, 71.
- The Frequency Range with Transformer Coupling**.—Pitsch, 463.
- Transformer Coupling** Elements in Television Equipment. Transmission Lines as **Coupling** Elements in Television Equipment.—Seely & Kimball, 3079.
- Coupling**; see also Cathode-Coupled, Frequency-Curves, Impedance, Iron, Negative-Feedback, Single-and-Coupled.
- Control of Electron Currents with Three-Electrode Crystal, and Model of Barrier Layer**.—Hilsch & Pohl, 1385.
- Crystal**; see also Coupled, Filters, Quartz.
- Wave Separators of Unsymmetrical Rise-and-Sink Type, and Double Ladder Delay Networks**.—Matsumoto, 1392.
- Attenuation Characteristics of All-Pass Type Delay-Network**.—Osaki & Nakasima, 1393.
- Graphical Delta Star Transformation**.—Williges, 3921.
- Regeneration Characteristics and Resonance Curves of Regenerative Detector**.—Kanazawa, 1384 & 4328.
- Anode-Bend Detector Circuit with Negative Feedback**.—Köpke, 1855.
- Detectors**; see also Audion, Diode.
- Behaviour of Diode Circuit to Interfering Low-Frequency and Direct-Current Voltages**.—Bruck, 3098.
- Diode Detector with Positive Bias**.—Sturley, 1836.
- Properties of Resonant Circuit loaded by Complex Diode Rectifier**.—Williams, 453.
- Interpretation of Amplitude and Phase Distortion in Terms of "Paired Echoes"**.—Wheeler, 3501.
- Distortion**; see also Beat-Oscillator, Feedback, Modulation, Non-Linear.
- Effect of Regenerative Feedback in Duplex Feedback Amplifier**.—Kobayashi, 4345.
- Cascade-Type Duplex Feedback Systems**.—Watanabe & Okamura, 1389.
- Electro-Mechanical**; see Analogies, Coupling-Oscillations.
- Theoretical and Experimental Investigation of Dow's [Electron Coupled] Circuit**.—Borisov, 3085.
- Calculation of Energy in Oscillating System by Operational Calculus**.—Rimski-Korsakov, 2290.
- Equivalent Circuits**; see Models, Modulator, Tensor-Analysis, Transformer.
- Use of Feedback to Compensate for Vacuum-Tube Input-Capacitance Variations with Grid Bias**.—Freeman, 926.
- Theory of Stability of Feedback Circuits with Lumped Constants**.—Mikhailov, 3084.
- Economic Feedback Circuit [for Transmitters]**.—Sandy & Twatt, 928.
- New System of Feedback [for Reduction of Distortion]**.—Zanarini, 3502.
- Feedback**; see also Ampli-Equaliser, Amplifier, Duplex, Negative, Non-Linear, Retroaction.
- Similarity of Critical Conditions in Ferroresonant Circuits**.—Thomson; Odlessey, 1847 & 2292.
- Practical Formulae for Tuning Circuits and Band Filters**, 2717.
- Band Filter of Variable Band Width, Constant Plateau Dip, and Fixed Band Centre, for the Broadcast Range**.—Alsleben & Weiler; G. W. O. H., 3090 & 4334.
- "Frequency-Shunting" Circuits [Separating Filters] of Constant Effective Resistance**.—Cauer, 3510.
- Filters in Open Circuit at Output Side**.—Cauer, 3915.
- Design of One and Two Section Cut-Off Filters**.—Dlugach, 78.
- Working Attenuation and Echo Attenuation of Loss-Free Filter Circuits**.—Feldtkeller, 939.
- Theory of Filters composed of "X" Circuits [Bridge Filters]**.—Feldtkeller, 2280.
- "Einführung in die Siebschaltungstheorie" [Filter-Network Theory: Book Review]**.—Feldtkeller, 3516.
- Effect of Retroaction and Negative Feedback on Form of Resonance Curve of Two-Circuit Detuning Filter and Coupling Filter**.—Frühaufl, 75.
- Crystal Band-Pass Filters**.—Gardiner, 81.
- Single-Sideband Filter Theory with Television Applications**.—Hollywood, 3511.
- Effect of Losses in Band Filters**.—Labin, 2281.
- New Methods of designing Electrical Wave Filters**.—Matsumoto & Saisyu, 4339.
- Electric Filters: Band Widths and Time Constants**.—Nicolas, 4335.
- 455-ke/s Crystal Filter with Wide-Range Band-Width Control**.—Oram, 460.
- Low-Pass Filters for Time-Delay Circuits**.—Owens, 3917.
- Simple Improvements in R-C Power-Supply Filters**.—Scott, 4340.
- Operation of [Band-Pass] Filters in Parallel**.—Stanesby, 3512.
- "Electric Circuits and Wave Filters: Second Edition" [Book Review]**.—Starr, 457.
- Channel Crystal Filters for Broad-Band Carrier Systems**.—Willis; Ziegler, 938.
- Three-Circuit Band-Pass Filters with Symmetrically Balanced Transmission Curves**.—Wucherer, 3916.
- Filters**; see also Amplitude, Cable, Chokon, Line, Magnetostriction, Networks, Parallel-Resonance, Quadripoles, Quartz, Reciprocal, Separating, Series, Smoothing, Transients.
- A Logarithmic Voltmeter with Differential Indication for Filter-Characteristic Plotting**.—Nuovo, 2716.
- Report on Spontaneous Fluctuations of Current and Potential**.—Bakker & van der Pol, 3081.
- Fluctuations in Neighbourhood of Periodic Motion of Auto-Oscillating System**.—Berstein, 1401.
- Report on Present State of Knowledge concerning Fluctuation Voltages in Electrical Networks and Thermionic Tubes**.—Moullin; Spenke, 2709 & 4325.
- Fluctuations of Thermionic Current and the "Flicker Effect"**.—Surdin, 3515.
- Representation and Computation of Fluctuation Voltages**.—Williams, 3907.
- Fluctuation**; see also Noise.
- Remarks on Paper "Forced Oscillations in Conductor of Finite Length and Diameter"**.—Titov; Suzant, 3101.
- Form-Factor**; see Filter.
- On Frequency Multiplication**.—Kleen & Ruffler, 3100.
- Quasi-Stable Frequency-Dividing Circuits**.—Fortescue, 3099.
- Analysis of Frequency Multiplier**.—Uchida, 4342.
- Frequency Characteristic**; see Detector, Filter, Single-& Coupled.
- Constructional Determination of Frequency Curves of Oscillating Circuits and Coupled Oscillating Circuits**.—Benz, 78.
- Frequency-Modulation**; see Negative-Feedback.
- Frequency-Response Control Networks**.—Ephraim, 4332.
- Frequency-Shunting**; see Delay-Networks, Filters, Separating.
- Graphical Analysis**; see Logarithmic.
- Bridge Grid Circuits**.—Vartel'ski, 446.
- Analysis and Design of Harmonic Generators**.—Terman, 447.
- Harmonics**; see Non-Linear.
- Hohlraum**; see Resonator.
- Impedance of Tapped Resonant Circuit**.—Sturley, 73.
- Impedance-Transformation**; see Transformation.
- Temperature Coefficient of Inductance**.—Bell, 2712.
- Mutual and Self Inductors Compensated for Change of Frequency**.—Campbell, 2711.
- Inversion Circuits**.—Drabkina, 930.
- Applications of Maxwell's Equations for Transformers to Circuits Imperfectly Coupled by Iron Cores**.—Blondel, 455.
- Iron-Cored**; see Ferroresonant.
- Laplace Transformation Theorem for Separation of Steady-State and Transient Processes**.—Droste, 2705.
- Limiting**; see Amplifier.
- High-Frequency Transmission-Line Networks**.—Allord, 1846.
- Exponential Transmission Line**.—Burrows, 458 & 1397.
- Resonant Frequency of Closed Concentric Lines**.—Hansen, 1396.
- "Resolving Bridge" for Transmission Lines, with Various Applications**.—Hartig & Brunetti, 3909.
- Theory of Design of Filters constructed from Resonant Lines**.—Mizuhasi, 80.
- Non-Uniform Lines with Distributed Constants**.—Neimann, 943.
- Methods for obtaining Travelling Electromagnetic Waves (in a Line) without Loss of Power**.—Neimann, 2706.
- Precise Determination of Four Line Quantities R, L, C, and G from Open-Circuit and Short-Circuit Tests**.—Niethammer, 3520.
- Transmission Lines with Exponential Taper**.—Wheeler, 1397.
- Lines**; see also Coupling, Forced, Laplace, Reactance.
- The Linear Characteristic [and Methods of obtaining It]**.—Bärisch, 4326.
- Locus Curves in High-Frequency Technique**.—Awender & Lange, 450.
- Rapid Graphical Analysis of Circuit Performance by Logarithmic Charts**.—Truscott, 3094.
- Wave Filters using Magnetostriction Resonators**.—Fukushima & Koitibara, 4336.
- Multi-Winding Magnetostriction Vibrator**.—Hayasaka, 4337.
- Matching**; see Transformation.
- Matrices**; see Quadripoles.
- Miller-Effect**; see Resistance-Capacity.
- Mitnahme**; see Synchronisation.
- Construction of Models for Oscillation Systems**.—Esafov & Teodorcbik, 1845.
- Distortions of Modulation due to Transmission Circuits of Modulated High Frequencies**.—Cafferata; Varaldi-Balaman, 3080.
- Equivalent Modulator Circuits**.—Peterson & Hussey, 1843.
- Theory of Multipole Conductors**.—Koizumi, 3092.
- Use of Negative Feedback in Broadcast Receivers**.—Aschenbrenner, 925.
- Application of Negative Feedback to Frequency-Modulation Systems**.—Chaffee, 3095.
- Calculation of Coupling Links in Negative-Feedback Circuits**.—Schmid, 2298.
- Negative Feedback Theory**.—Tellegen & Haantjes, 1833.

Properties of Circuits—

- Negative-Feedback** : see also Amplifier, Detector, Feedback, Filter, Reciprocal, Rectification.
- Differential Negative Resistances and Relaxation Oscillations.**—Carrara, 64.
- Effect of Stray Admittances in Four-Arm Bridge Networks.**—Astbury, 68.
- Certain Properties of Dissymmetrical T Pure Reactance Networks.**—Cafferata, 3509.
- Notes on Equivalence of Electrical Networks.**—Calabrese, 3918.
- Design of R.F. Output Networks for Broadcasting Transmitter.**—Koike, 2283.
- Fundamental Equations of Networks.**—Okada, 1395.
- Number of Impedances of an n Terminal Network.**—Riordan, 3093.
- Networks** : see also Coupling, Delay-Networks, Delta-Star, Frequency-Response, Line, Locus, Multipole, Quadripole, Reciprocal, Relay, Tensor, Transformer.
- Experiments with Neutralising Circuits.**—Momonaka & Sazi, 934.
- An Investigation of the Complex Bridge Neutralising Circuit.**—Neiman, 69.
- Theory of Complex Neutralising Circuits.**—Zeitlenok, 70.
- "Théorie et Technique du Bruit de Fond" [Background Noise] [Book Review].**—Bedeau, 2710.
- Noise of Thermal Agitation [in Carrier-Current Telephony].**—Hölzler & Arens, 3908.
- Note on Resistance Noise in Coaxial Pair.**—Josephs, 3514.
- Noise** : see also Fluctuation, Nyquist's-Theorem, Resistance.
- Noise-Suppression** : see Duplex-Feedback.
- Non-Linear Distortion due to Use of Non-Linear Impedances in Regulating Apparatus.**—Grigor'ev, Dulitski, & Egorov, 3083.
- A Non-Linear Differential-Feedback Oscillator.**—Hakata & Abe, 929.
- Oscillations in Certain Non-Linear Driven Systems.**—Herr, 3506.
- Method of calculating Harmonics in Non-Linear Circuits.**—Sugi, 65.
- Papers on Calculation of Non-Sinusoidal Periodic Régimes.**—Quilico : Sartori, 3911.
- General Validity of Nyquist's Theorem.**—Bell, 3082.
- Nyquist's** : see also Brownian.
- Operational Calculus** : see Energy.
- Oscillations** : see Auto-Oscillation, Coupled, Forced, Self-Excitation. Some Properties of Oscillatory Circuits.—Rutelli, 449.
- Parallel-Resonance Circuit, with Losses, as A.C. Resistance.**—de Gruyter, 1840.
- Generalised Resonance Curves for Parallel-Resonant Circuits with Losses.**—Ferrari-Toniolo, 77.
- Contribution to Study of Parallel Working of Electric Generators.**—Petrovich, 4329.
- Parameters** : see Variable.
- Periodic** : see Non-Sinusoidal.
- Improved Phase Shifter of Bridge Type.**—Sakamoto, 2285.
- Influence of Inductance and Spark Resistance of Pulse Discharge Circuit on Maximum Steepness of Voltage Rise.**—Beindorf, 84.
- "Efficiency" Attenuation in Quadripole Technique.**—Schulz, 941.
- Transformation to Principal Axes of Quadripole Matrices and Their Application.**—Weizel, 2715.
- Transmission Functions of Quadripoles of Pure Reactance inserted between Two Resistances.**—Cocci, 940.
- Filters employing Y-Cut Quartz Plates.**—Yoda & Kato, 4338.
- New Types of "Control" and "Filter" Quartzes.**—Rohde, 2279.
- Quartz-Resonators** : see also Cable, Filters.
- Quasi-Stable** : see Frequency-Dividing.
- Radiation-Resistance** : see Nyquist's-Theorem.
- Synthesis of a High-Frequency Reactance.**—Ramo, 2707.
- Reactances** : see also Retroaction.
- Reactive Resistance of Systems, including Source of Power.**—Tetelbaum, 2714.
- Contribution to Study of Reciprocal Networks.**—Julia, 3091.
- Anode-Bend Rectification with Negative Feedback, with Low Distortion and Attenuation.**—Köpke, 1383.
- Analysis of Transients produced when Sinusoidal E.M.F. is applied to Circuit containing Rectifier.**—Gonorovski, 452.
- Half-Wave Gas-Rectifier Circuits.**—Wallis, 66.
- Determination of Circular Currents of Two Current Rectifiers in Cross Connection.**—Bulla, 3922.
- Rectifiers** : see also Diode, Smoothing.
- Curve-Form Error in Ideal Rectifying Instrument.**—Klutke, 454.
- Relaxation Oscillations [Rocard's Solution, Meissner's Method, Use of Simple Integrals].**—Muller, 1844.
- Note on Synchronisation of Relaxation Oscillations.**—Rocard, 3507.
- Influence of Regenerative Coupling on Frequency of Relaxation Oscillations in Interrupted Generator, and Appearance of Complex, Relaxation Oscillations.**—Shostakov, 933.
- Relaxation Oscillators** : see also Non-Linear, Self-Excitation.
- Papers on Relay Circuit Theory.**—Nakasima, 83 & 1394.
- Relay Circuits** : see also Switch.
- An Electrically "Cold" Resistance.**—Perceval, 2708.
- High-Frequency Resistance.**—Straford, 2289.
- Resistance** : see also Brownian, Parallel-Resonance, Reactive.
- Resistance-Capacity Tuning.**—Willams, 923.
- Resistance-Capacity Tuning.**—Roberts, 2719.
- Resonance** : see Impedance, Parallel, Series.
- A Type of Electrical Resonator ["Hohlraums"].**—Hansen, 63.
- Valves with Wattless Retroaction as Adjustable Reactances.**—Tuxen, 3096.
- Special Retroaction Connection.**—Wittwer, 465.
- Retroaction** : see also Amplifiers, Back-Coupled, Detector, Feedback, Filter, Relaxation.
- Self-Excitation of Oscillations : Mathematical Theory of Retroaction and the Mitnahme of Oscillating Circuits.**—Kober, 60.
- New Possibilities of Realising Electrical "Weiche" Separating Filters.**—Lehmann, 935.
- Electrical Conditions for Wire-Broadcasting Separating Filters.**—Waldow, 936.
- Series-Resonance Circuit, Coupled Circuits, and Band Filters.**—de Gruyter, 4333.
- Note on "On Single and Coupled Tuned Circuits having Constant Response-Band Characteristics."**—Loh : Benham, 459, 937 & 1391.
- Single-Sideband** : see Filter.
- An "Imaginary Shell" valid at All Frequencies [Modification of Skin-Effect Formula].**—Levasseur, 3103.
- On Methods of Calculating Supplementary Losses [Skin & Proximity Effects] in Non-Magnetic Conductors.**—Kohn, 3102.
- Time Delays due to Smoothing Circuits.**—Ostendorf, 67.
- Designing Smoothing Filter of Rectifier.**—Yokoyama, 4341.
- Smoothing** : see also Filters.
- Spectrum Analysis** : see Ultra-High-Frequency.
- Stability** : see Coupled, Variable.
- "Hard" Valve Electronic Relay Switch.**—Clothier, 4350.
- Switching** : see also Trigger.
- "Mitnahme" and Synchronisation of Self-Excited Oscillations.**—Urtel, 1399.
- Synchronisation** : see also Beat-Oscillator, Non-Linear, Relaxation.
- Television** : see Amplifier, Cathode-Coupled, Filter, Parallel-Resonance.
- Tensor Analysis and Its Application to Equivalent Circuits.**—Epstein, 1402.
- Application of Tensor Concept to Complete Analysis of Lumped Active, Linear Networks.**—Epstein & Donley, 3912.
- "Tensor Analysis of Networks" [Book Review].**—Kron, 2284.
- Thermal-Agitation** : see Fluctuation, Noise.
- Definition and Calculation of the Time Constants of Electrical Circuits.**—Sartori, 1398.
- Theory of Four-Terminal Impedance Transformation and Matching Circuits.**—Mizuhasi, 82.
- High-Frequency Transformer Free from Leakage Inductance in Secondary Winding.**—Denisov, 3519.
- Two Simple Equivalent-Circuit Diagrams for Calculation of Networks with Differential Transformers.**—Kamphausen, 3919.
- Potential Distribution along Transformer Windings.**—Ogawa, 942.
- Frequency Range of Output Transformer.**—Pitsch, 3518.
- Four Equivalent-Circuit Diagrams of Transformer.**—Pitsch, 3920.
- Transformers** : see also Coupling.
- Transients of Resistance-Terminated Dissipative Low-Pass and High-Pass Electric Wave Filters.**—Chu & Chang, 79.
- Elementary Process for Calculation of Transient Régimes, using Imaginary Notations.**—Fronny, 451.
- General [Operational] Method for Calculation of Transient Phenomena in Radio Circuits.**—Giorgi, 4327.
- Transients** : see also Laplace, Pulse.
- Transmission-Line** : see Line.
- Trigger Circuits.**—Reich, 4351.
- Switching Action of Eccles-Jordan Trigger Circuit.**—Toomin, 3508.
- On Methods of Tuning to Resonance.**—Hegner, 1400.
- Tuning** : see also Filters, Resistance-Capacity.
- Electron-Optical Spectrum Analysis of [Ultra-] High-Frequency Oscillations.**—Hollmann & Thoma, 448 & 3077.
- Stability and Instability in Electric Circuits with Parameters Variable in Time, with and without an Inserted E.M.F.**—Einaudi, 3505.
- Investigations on Circuits with [Periodically] Variable Capacity.**—Schemmrich, 2713.
- Voltmeter** : see Filter-Characteristics.
- Volume-Compression** : see also Amplifier, Amplitude, Non-Linear.
- Wave-Separators** : see Delay-Networks, Separating.

TRANSMISSION

- New Multi-Frequency Aircraft Equipment, 1421.**
- Aircraft** : see also Automatic.
- Amplifiers with Automatic Volume Compression.**—Bertolotti, 3114.
- Proportioning of Oscillator Circuit in Amplifiers.**—Boella, 3118.
- Low-Distortion Limiting Amplifier [for Volume Compression].**—Cook, 3534.
- Peak-Limiting Amplifier for Amateur Use.**—Macfarland, 2308.
- Amplifiers** : see also Limiting, Modulation, Power-Amplifier.
- Modulation of H.F. Emitters [particularly Dynatron, Retarding-Field, or Magnetron Type] by Amplitude Limitation.**—Gundlach, 1855.
- Papers on Asymmetric-Sideband Broadcasting and Single-Sideband Telephony.**—Eckersley : Koomans, 93.

Transmission—

- Remarks on Theory of Devices for **Automatic** Variation of Dynamic Range.—Grigor'ev, Dulitski, & Egorov, 106.
- Automatic Air Signals** [to help Tracing after Crash], 110.
- Automatic**: see also Circuit-Breakers. Modulation, Phase-Regulation, Volume-Compression.
- Back-Coupling**: see Ultra-High.
- Theory of **Barkhausen-Kurz Valve**.—Kockel & Mrowka, 1403.
- Barkhausen Oscillations** of Double the Frequency of Electron Swings.—Mohr, 87.
- Barkhausen-Kurz Oscillations** in "Free Anode" Circuit.—Otpuschennikov, 3104.
- Barkhausen-Kurz Electron Oscillations**.—Kostagni, 2728.
- Bimodulated Oscillations**.—Kostsov, 3532.
- "Institute of Radio Engineers Standard, 1938: Transmitters and Antennas" [Book Review], 3537.
- "Magnetron Oscillations of Ultra-Short Wavelengths, and Electron Oscillations in General" [Book Review].—Okabe, 466.
- The **Bridge-Stabilised Oscillator**.—Meacham, 104.
- Bridge**: see also Neutralising.
- Design of Radio-Frequency Output Networks for **Broadcasting Transmitters**.—Koike, 2305.
- A 50-Kilowatt **Broadcast Transmitter**, and Improved Design for 5-Kilowatt **Broadcast Transmitter**.—Kishpaugh: Coram, 957.
- Papers on Distortions in **Carrier-Frequency** Transmission Systems.—Jacoby & Günther: Tishner, 1417.
- Cathode-Ray**: see Electron-Beam, Plate-Condenser.
- "Chopped-Signal" Vacuum-Tube Generator with Good Voltage Regulation.—Williams & Fairweather, 3536.
- H.T., D.C. Quick-Acting **Automatic Circuit Breakers** for Radio Transmitting Stations.—Sprovo, 101.
- Application of **Composite Modulation** to Problems of Sideband-Width Contraction.—Hayasi & Yamagiwa, 1413.
- Compressors**: see Volume-.
- How Much **Condenser Spacing**? Circuits to lower Voltage across Condenser Plates.—Ferrill, 477.
- Improvement in **Constant-Frequency Oscillators**.—Lampkin, 2730.
- Contrast Compressor** and Expander.—Weber, 105.
- Automatic Contrast Compression** and Expansion free from Time-Lag and Distortion.—Lachner, 478.
- Grid Bias** for **Crystal Oscillators**.—Bell, 102.
- Crystal Control** for Portable and Semi-Portable Broadcast Pick-Up Transmitters.—Carter, 1857.
- Crystals** [with Practical Information on Stabilisation].—Dent, 103.
- One **Crystal—Two Tubes—Five Bands**: Odd Harmonics as well as Even for Amateur Bands.—Ferrill, 1858.
- 250-Watt **Crystal Oscillator**.—Koga, Yamamoto, & others, 2300.
- What's Your **Crystal Frequency**?—Lusk, 1419.
- 300-Watt Beam-Power-Tube **Crystal Oscillator**.—Miyauti & Sasaki, 4369.
- A 15-Watt **Crystal-Controlled Five-Metre Phone**.—Pickett, 1856.
- Crystal**: see also Quartz.
- Increasing **Danger** of Electrical Death or Maiming in Amateur Transmitters, 1422.
- Decimetric**: see also Micro-, Modulation.
- Differential-Feedback**: see also Non-Linear.
- Production of Ultra-High-Frequency Oscillations by **Diodes**.—Llewellyn & Bowen, 3106.
- Diodes**: see also Rectifier.
- Influence of Load Frequency-Characteristic on **Distortion** when Anode Modulation is used.—Evytanov, 95.
- Compensation of **Distortion** in Radio Transmitters by Use of Feedback Amplification.—Model & Person, 97.
- Distortion**: see also Carrier-Frequency, Feedback, Non-Linear, Rectifier, Splatter.
- Doherty**: see Broadcast, Modulation.
- Excitation of Oscillations with Help of a **Dynatron** in Circuit with Uniformly Distributed Electrical Constants.—Majewski, 3108.
- Dynatron**: see also Transitron, Very-Low.
- Study of Motion of **Electrons** in Positive-Grid Triodes.—Bigenet & Consigny, 4355.
- Space Charge and Field Waves in an **Electron Beam**.—Ramo, 4352.
- Electron-(ic)**: see also Barkhausen, Book-Review, Inertia, Magnetron, Transit-Time, Ultra-High.
- Answer to **Electron-Coupled Oscillator Problem**.—Perrine, 4368.
- Portable **Emergency Transmitters**: Five Variations in Compact Equipment Design, 3929.
- Portable **Emergency Utility Transmitter**.—Leuck, 4371.
- Hurricane **Emergency Transmitter** and Power Supply.—Smith, 3541.
- Emergency**: see also Portable.
- Rehennets in Combination **Exciters**: Effective Designs for Low-Power R.F. and Audio Stages.—Ferrill, 476.
- Economic **Feedback Circuit**.—Sandy & Twatt, 952.
- Applying [Inverse] **Feedback** to Broadcast Transmitters.—Young, 4381.
- Feedback**: see Distortion.
- Anti-Harmonic **Filters**.—Chambers & Bacon, 4382.
- Four-Band Transmitter** [7 . . 56 Mc/s].—Lever, 3928.
- Fundamental Considerations on **Four-Phase Oscillation Circuits**, and A Polar Variable-Phase Oscillator.—Takao, 2297 & 4373.
- Four-Phase**: see also Polyphase.
- Fractional-Frequency Generators** utilising Regenerative Modulation.—Miller, 3531.
- Experimental Investigation of Displacement of a **Frequency Band** of Theoretically Arbitrary Width through Desired Phase Angle.—Vilbig, 3930.
- Frequency-Checking Superhet**: Utilising Broadcast Stations for Amateur Transmitter Frequency Control.—Griffin, 2302.
- Notes on a Precise **Frequency-Control System** for Unsupervised Transmissions for Ionospheric Research.—Pierce, 2731.
- Frequency-Controlled Oscillators**.—Sabaroff, 1859.
- Frequency-Doublers** [making One Crystal control Transmissions on Several Frequencies].—Dent, 2732.
- Frequency-Drift Compensation**.—Levy, 3535.
- Frequency Investigations** on Decimetric-Wave Transmitters by means of a Crystal Detector.—Schmidt, 3524.
- Frequency Modulation** Demonstrated.—Armstrong, 3110.
- Frequency Modulation** in America.—Armstrong, 2734.
- Wide-Band **Frequency Modulation**.—Roder, 91.
- Frequency-Modulation Transmitters** and Propagation Characteristics.—Weir, 2733.
- Field Tests of **Frequency- and Amplitude-Modulation** with Ultra-High-Frequency Waves.—Weir, 3528.
- Frequency-Modulation**: see also Composite-.
- Frequency-Multiplication**: see Fractional-Frequency, Frequency-Doublers, Modulation.
- Energy Considerations in Determining Number of Steps in **Frequency Range** of Radio Transmitter.—Evtsev & Panov, 953.
- Frequency-Stabilising Tuner** for Ultra-Short-Wave Transmitter.—Uchida, 4365.
- Measurements of **Frequency Stability** and Overtone Content of Valve Oscillators.—Nusslein, 2298.
- Frequency-Stability**: see also Constant-Frequency, Crystal, Differential-Feedback, Frequency-Control, Quartz, Stabilisation, Temperature.
- Grid-Bias**: see Crystal.
- Experiments on **Grid Spiral Oscillations**.—Kobayasi & Moriwaki, 4357.
- Sinusoidal Oscillations in **Habann Valve**.—Lämchen & Müller, 2727.
- Habann**: see also Magnetron.
- Analysis and Design of **Harmonic Generators**.—Terman, 474.
- Hohlraum**: see Klystron.
- Impulse-System**: see Synchrony.
- Inductance**: see Temperature.
- Inertia (Electron)**: see Oscillator.
- Interelectrode**: see Triode.
- Highly-Damped Radio Transmission Method for **Interference Transmissions**.—S.A.F.A.R. & Castellani-Milano, 4374.
- Ionised-Gas**: see Magnetic.
- Iron Cores** for Power Oscillators.—Mallory Company, 1867.
- The Production of H.F. "**Kipp**" Oscillations with Gaseous-Discharge Tubes.—Pieplow, 109.
- New Radio Apparatus uses Waves only 4 Inches Long ["**Klystron**"].—Varian, Hansen, & others, 1848.
- Resonators suitable for **Klystron Oscillators** ["Hohlraum" Resonators].—Hansen & Richtmeyer, 2295.
- High-Frequency Amplifier and Oscillator ["**Klystron**"].—Varian & Varian, 2725.
- "**Klystron**" Ultra-High-Frequency Generator applied to Blind Landing Beams (Horn Projector), 3522.
- Klystron**: see also Velocity-Modulation.
- Leads**: see Triode.
- Level **Limiters** for Compressors.—Rosenberg, 107.
- New **Limiting Amplifier**.—Davis: Collins Radio, 1415.
- Working of Ionised-Gas Oscillators in a **Magnetic Field**.—Jonescu, 1410.
- Wavelength of Electron Oscillation in **Magnetron**.—Hara & Mito, 1853.
- Magnetron** as a Constant-Current Oscillator.—Hara, 4361.
- Output and Efficiency of the Split-Anode **Magnetron** oscillating in the Dynatron Régime.—Harvey, 3107.
- Theory of Asymmetrically Split **Magnetrons**.—Hisida, 4360.
- Contributions to Theory of Two-Slit **Magnetron** in Range of Habann Oscillations.—Ito, 467.
- First-Order Transit-Time Oscillations in **Magnetrons**.—Lerbs & Lämchen, 1408.
- Formation of Negative Resistance in Split-Anode **Magnetron**.—Lukoshkov & Hijnski, 2293.
- Unbalancing of Split-Anode **Magnetron** by Anode Current.—Nakamura, 947.
- Electron-Beam **Magnetrons** and Type-B Magnetron Oscillations.—Okabe, 1409.
- Posthumus Oscillations in **Magnetron** [Corrections].—Ollendorff: Fischer & Ludi, 1854.
- Generation of Micro-Waves with "Sectionalised **Magnetron**."—Owaki & Suzuki: Okabe, 946.
- Magnetron**: see also Book-Review, Habann.
- Method of Modulation on 25 cm **Micro-Wave Service** between Eindhoven and Nireguen.—von Lindern & de Vries, 949.

Transmission—

- Micro-Wave**: see also Amplitude-, Barkhausen, Cathode-Ray, Electron, Frequency-Investigations, Grid-Spiral, Magnetron, Modulation, Osaka, Phase-Focusing, Retarding-Field, Sentron, Shock-Excitation, Short-Wave, Stabilisers, Ultra-, Velocity-Modulated.
- Mobile Short-Wave Transmitters for Broadcast Commentaries.**—Holmann, 111.
- Operation of Doherty's Output Stage with Ordinary Modulation and with Hagup Modulation.—Bosse & Fricke, 1862.
- Correction to "Automatic Adjustment for Modulation Indicator."—Carlson, 99.
- High-Efficiency Grid Modulation in a Portable 14-Mc 'Phone Transmitter: New Terman System.—Denton: Terman & Woodyard, 3530.
- Indirect Methods of Modulation for Decimetre-Wave Emitters.—Haass, 468.
- Modulation Methods for the Attainment of a High Efficiency.**—Hofer, 2304.
- Amplitude Modulation of a Frequency-Multiplying Stage.—Ivanov, 89.
- Special Properties of Broadcasting Transmitter by Method of High-Power Modulation.—Kono, 4376.
- Classification, according to Efficiency, of the Various Transmitting Systems for Modulated Waves.—Loeb, 958 & 3112.
- Increased Output with Grid-Bias Modulation.—McCullough, 4378.
- Analysis of Load-Impedance Modulation.—Roder: Parker, 3529.
- Modulation of Transmitter Amplifier.**—Rothe, 3111.
- Modulation** [Examination of Definitions and Fundamental Principles].—Ruprecht, 2303.
- New Method of Modulation for Decimetric-Wave Emitters.—Schäfer, 90.
- High-Efficiency Modulating System.—Vance, 4377.
- Comparing Efficiency of Modulation Systems with One and Two Sidebands.—Zeitlenok, 470.
- Modulation**: see also Amplitude-, Bimodulated, Composite-, Distortion, Frequency-, Micro-Wave, Osaka, Phase-, Rectifier, Sideband, Transformers, Two-Channel.
- Star-Circuit Modulator as Double-Push-Pull Modulator.**—Aschoff, 951.
- Mode of Action of Star-Connected Modulator.—Aschoff, 3116.
- Copper-Oxide Modulators in Carrier Telephone Systems.—Caruthers, 3115.
- Equivalent Modulator Circuits.—Peterson & Hussey, 1864.
- Multi-Frequency**: see Aircraft.
- Negative-Resistance**: see Dynatron, Magnetron.
- Networks**: see Broadcasting.
- Compact 500-Watt All-Band Transmitter: Practical Application of Inductive Neutralisation.—Jones: Craft & Collins, 2737.
- Investigation of Complex Bridge Neutralising Circuit.—Neiman, 98.
- Non-Linear Distortion** due to Use of Non-Linear Impedances in Regulating Apparatus.—Grigor'ev, Dulitski, & Egorov, 3113.
- Non-Linear Differential-Feedback Oscillator.**—Hakata & Abe, 955 & 2306.
- Amplitude Modulation of "Osaka" Tube having a Mesh Grid.—Baba, 4362.
- Polar Variable-Phase Oscillator.—Takao, 4380.
- Theory of Valve Oscillators in which Account is taken of Electron Inertia.—Zeitlenok, 88.
- Oscillators**: see also Crystal, Electron-Coupled, Frequency-Controlled, Iron, Magnetic, Magnetron, Non-Linear, Stability, Synchronised, Ultra-.
- WSOC's Pack Type Transmitter [Ultra-Short-Wave].—Carter, 3527.
- Experiment in Parallel Operation of Oscillators on Short Waves.—Nevvazhski, 3533.
- Parasitic Circuits** [in Transmitters].—Erkstrand, 100.
- Phase-Displacement**: see also Frequency-Band.
- Experimental Proof of "Phase Focusing" of Electrons.—Mayer, 1412.
- Communication by Phase Modulation.—Crosby, 92 & 1863.
- Automatic Phase Regulation at Very High Frequencies.—Gonorovski, 96.
- Oscillation Production by Electron Beam in Field of Plate Condenser with Consideration of Effect of Stray Fields.—Hollmann & Thoma, 86.
- Addition to My Paper on [Ultra-High-Frequency] Oscillation Onset in Plate Condenser.—Recknagel: Hollmann & Thoma, 1408.
- Oscillation Generation by a Cathode Ray in Field of Plate Condenser.—Thoma, 4353.
- New Transmission System [Polyphase Radiation with Amplitude Modulation].—Collins Radio: Byrne, 1861 & 3931.
- Polyphase**: see also Four-phase.
- "Runt Sixty" and "QSL Sixty" Portables.—Sutter, 4372.
- Portables**: see also Emergency.
- Power**: see also Ship.
- An Ultra-High-Frequency Power Amplifier of Novel Design.—Haefl, 1849.
- Power Amplifiers**: see also Haefl, 3954.
- Variable-Frequency Quartz-Crystal Oscillator.—Uda, Honda, & Watanabe, 956.
- New Types of "Control-" and "Filter"-Quartzes.—Rohde, 2301.
- Analysis of Transients produced when Sinusoidal E.M.F. is applied to Circuit containing Rectifier.—Gonorovski, 472.
- Properties of a Resonant Circuit loaded by a Complex Diode Rectifier [Distortionless Modulation].—Williams, 471.
- Relaxation-Oscillation**: see Kipp, and under "Properties of Circuits" and "Subsidiary Apparatus & Materials."
- Contribution to Analytical Theory of Retarding-Field Oscillator.—Baumann, 1404.
- Action of Cathode Choke in Retarding-Field Generator.—Schwarz, 3105.
- Influence of Space Charge in Plane Retarding Field.—Kleinsteuber, 3925.
- Retarding-Field**: see also Barkhausen, Micro-Wave, Transiron, "Safety" becomes a Watchword.—De Soto, 2738.
- Safety** Technique in Transmitter Operation and Construction.—Gramer, 1866 & 2311.
- Need for Safety-of-Life Precautions in Amateur Transmitting Installations, etc.—Hull: Warner, 479.
- Ultra-High-Frequency Oscillations obtained by Sentron Tubes.—Uda, Ishida, & Siojii, 945.
- Relation between Power radiated by Ship Station and Number of "Metre-Amperes."—Marique, 2312.
- Radiophonic Transmitter Type B.E.M.1/2 for Ships of Small Tonnage, 3540.
- Influence and Control of Form of Charges moving Periodically in Electron Valves, particularly in Shock Excitation of [Ultra-] Short-Wave Oscillations.—Jobst, 4354.
- Shock**: see also Danger, Safety.
- Short-Wave Transmitter Type B.E.C.1/20 [for 18-48 m Waves], 3539.
- A Short-Wave Generator.—Gill, 3923.
- 100 Kilowatt Short-Wave Broadcasting Transmitter Type S.W.B. 14 & 18.—Green & Moody, 3538.
- Short-Wave**: see also Mobile, Parallel-Operation, Phase-Regulation.
- Transmission of Sidebands when Anode Modulation is used.—Model, Person, & Sobolev, 94.
- Transmission of Sidebands in Radio Transmitter.—Model, 469.
- Sidebands: see also Asymmetric, Composite-, Modulation, Single-Simplicity on 112 Mc: Easily Constructed Transmitter of Output up to 100 Watts.—Griffith, 3528.
- Experimental Single-Sideband Transmitter [No Crystal Filters].—Aiken & Lob, 1860.
- Experiment of Producing Single Sideband.—Nakai & Oguma, 4375.
- Restoration of Sideband suppressed in Single-Sideband Modulation.—Vilbig, 950.
- Single-**: see also Modulation, Sideband.
- High-Voltage Smoothing: Alternative to Choke-Capacity Filter, 1865.
- Spherical-Tank Ultra-High-Frequency Oscillator.—Hollmann, 1407.
- Better 'Phone Operation without "Splatter."—Bain, 4379.
- Stabilisation of Ultra-High Frequency in Resonance-Line Radio Transmitter.—Shitikov, 3525.
- Frequency Stabilisation of Ultra-Short-Wave Transmitter.—Uchida, 3927.
- Stabilisation: see also Bridge, Frequency-S, Stabilisers, Stability.
- Comparison of Various Stabilisers for Decimetric Waves.—Morita & Hayasi, 4367.
- Stability of Triode-Oscillator with Grid-Condenser and Leak.—van Slooten, 1418.
- Superheterodynes**: see Frequency-Checking.
- Constant-Output Synchronised Oscillator Independent of Input Synchronising Voltage.—Hayasi, Hukusaki, & Yamagiwa, 1414.
- Synchrony** Control in Impulse System [of Telegraphy].—Hudec, 959.
- Temperature Coefficient of Inductances for Use in Valve Generator.—Moulin, 954.
- Dependence on Frequency of Temperature Coefficient of Inductance of Coils.—Thomas, 1420.
- Compensation of Temperature Coefficient of Tuning Circuit.—Uemura, 2299.
- Calculation and Design of Modulation Transformers.—Boella, 1416.
- Transients**: see Rectifier.
- Influence of Transit Time of Electrons in Valves.—Clavier, 1405.
- Transit-Time**: see also Power-Amplifier.
- Transitron Oscillator [Retarding-Field Negative-Transconductance Circuit].—Brunetti, 1851 & 2296.
- New "Spot Wave" Series of Commercial Radio Transmitters, 4370.
- Recent Developments in Radio Transmitters.—Coleman & Troutant, 2309.
- Radio Progress during 1938: Transmitters and Antennas.—I.R.E., 2736.
- Transmitters**: see also Chopped-Signal, Crystal, Emergency, Four-Band, Frequency, Neutralisation, Parasitic, Polyphase, Ships, Single-Sideband, Whaling, Variable-Frequency.
- Effect of Interelectrode Capacities and Active Resistances of Leads on Length of Wave generated by a Triode.—Katzman, 2294.
- Tuning** Transmitter Circuits by Simultaneous Variation of L and C in Straight-Line Frequency Relationship.—Evetev & Panov, 3117.

Transmission—

- Possibility of **Two-Channel** Communication with Single Carrier Wave.—Anitov & Keniszen, 473.
- Generation of **Ultra-High-Frequency** Radio Waves by Electronic Oscillations.—Banerjee & Rao, 4356.
- Ultra-Short-Wave** Oscillators.—Black, 2729 & 4363.
- 22A Transmitter [for **Ultra-Short-Wave** Police System].—Caughey, 948.
- Ultra-High-Frequency** Resonances in Positive-Grid Triode.—Chipman, 3924.
- Triode Oscillators for **Ultra-Short** Wavelengths.—Gavin, 4358.
- Methods of **Ultra-Short** Wave Production.—Hollmann, 1411.
- Variable Oscillator for **Ultra-High-Frequency** Measurements.—King, 3523.
- High-Power Generation at **Ultra-High** Frequency by means of Back Coupling.—Kobavashi & Nisio, 944 & 4359.
- Ultra-High-Frequency** Oscillations of Diodes and Triodes.—Matsudaira, 1852.
- Experimental **Ultra-Short-Wave** Transmitter.—McPetrie & Carter, 4364.
- Some Electronic Phenomena relating to **Ultra-High-Frequency** Oscillations.—Okabe, 3926.
- High-Q Tank Circuit for **Ultra-High** Frequencies.—Peterson, 4366.
- Ultra-High, -Short**: see also Amplitude-Limitation, Constant-Frequency, Crystals, Diodes, Dynatron, Four-Band, Frequency-Klystron, Micro-Wave, Pack-Type, Plate-Condenser, Power-Amplifier, Simplicity, Spherical-Tank, Stabilisation, Transit-Time, Transistron, Velocity-Modulated, Wide-Band.
- Variable-Frequency** Control for Transmitters.—Griffin, 475.
- Variable-Frequency**: see also Quartz, Wide-Band.
- Velocity-Modulated** Tubes.—Hahn & Metcalf, 1850.
- Small-Signal Theory of **Velocity-Modulated** Electron Beams.—Hahn, 3521.
- Velocity Modulation** of Electron Beams: New Ultra-High-Frequency Development.—Wheelock, 2726.
- Production and Frequency-Measurement of Currents having **Very Low** Frequencies from 10 to 100 Cycles per Second.—Clark & Katz, 108.
- Volume Compression** Simplified: Speech Amplifier-Compressor with Novel Features.—Lamb, 2735.
- Automatic Volume Compression**.—Pawley, 2307.
- Volume-Compression**: see also Amplifier, Automatic, Contrast, Limiter (ing), Non-Linear.
- Telefunken Whaling Transmitter, 2310.
- Wide-Band** Variable-Frequency Testing Transmitters [for **Ultra-Short** Waves].—Usselman, 3109.
- Wide-Band**: see also Frequency-Modulation.

RECEPTION

- Sound Source with Resonant Chamber and Acoustical Correction of Radio Receivers and Acoustical Measurements of Linearity in Radio Receivers.—Faggiani: Santoro, 3544.
- Influence of **Aerial-Coupling** on Sensitivity and Selectivity.—Benz, 4391.
- Ultra-High-Frequency** Receiver with Wide Range of 60-132 Mc/s [for Aircraft].—McKeel, 481.
- More about **Amateur** Interference with Broadcasting.—Gustafson, 4390.
- Amplitude Limiters** and Auto-Regulating Systems in Communication Technique.—Nuovo, 2748.
- Receiving Conditions in the Arctic.—Hunter, 1424.
- Note on **Asymmetric** Sideband Phase Distortion.—Benham, 503.
- Modulation Range of Audion.—Oertel, 3127.
- Distortions at Coming into Action of Delayed **Automatic Volume Control**.—Saic, 3130 & 3549.
- Papers on Variable-Mu Valves for AVC, etc., with "Sliding" Screen-Grid Voltage.—Schiffel: Scheel, 484.
- Automatic Volume Control** Characteristic.—Scroggie, 2749.
- Design of **Automatic-Volume-Control** Rectifier Circuit and Distortion due to Bias.—Williams, 486.
- Automatic**: see also Amplitude, Contrast, Control, Frequency-Control, -Drift, -Regulation, Input, Multi-Grid, Noise, Pre-Amplifier, Selectivity, Threshold, Tuning.
- Radio Reception in **Aviation**.—Esau, Jansky, Kotowski, Klumb, 3122.
- "Die Empfangsanlagen . . ." [Receiving Equipments of State Service for Safety in **Aviation**: Book Review].—Koch, 1428.
- Aviation**: see also Commercial.
- Barometric-Height**: see Reception.
- Broadcast Receivers**.—A.E.G., 979, 3137 & 3942 3; Ericsson, 1885; German "People's Set," 983 & 1883; German "Small Receiver," 983 & 2328; German "Ostmark" Industry, 135; Philco Portable (Dry Battery only), 3138.
- Broadcast Receivers**: see also Acoustical, Cabinet, Car-, Circuit-Design, Communication, Community, Current-Economising, Detuning, Dual-Diversity, Exhibition, Fasteners, Gas-Operated, German, Headphone, High-Fidelity, -Quality, Local-Distance, Midsets, Negative-Feedback, Power-Supply, Push-Button, Radio-Receivers, Regimented, Remote-, Reproduction, Safety, Schools, Short-Wave, Standard, Superheterodyne, Tone-Control, Tropics, Tuning, Wireless World.
- Plastic Cabinet** Design.—Chase, 3558.
- Car** Radio Equipment [at Motor Exhibition, 1938]. 134.
- External R.F. Converters [for Broadcast-Band **Car Receiver**].—Kennedy, 1433.
- Output Stage in **Car Receivers** with Valves EBC 11 and EDD 11.—Scheel, 507.
- Cathode-Coupled** Circuits.—Cocking, 504.
- Circuit Design** related to Tube Performance.—Hollands, 3547.
- Rapid Graphical Analysis of **Circuit Performance** by Use of Logarithmic Charts.—Truscott, 3134.
- Tuning Coils** in Production, 130.
- Theory and Design of "Progressive Universal" Coils.—Joyner & Landon, 129.
- Coils**: see also Ferromagnetic, Iron-Cored.
- Factors influencing the "Q" of R.F. Coils in Amateur-Band Receivers.—Pollack, 1438.
- Evolution of **Commercial** Receivers, for Fixed, Marine, and Aviation Purposes.—Berton, 977.
- Operating a "Communication" Receiver.—Hallows, 968.
- Community-Aerial** Installations, Construction and Results.—Moebes, 2745.
- Why **Components** Fail: Relative Susceptibility to Breakdown.—Cazaly, 4406.
- VDE Rules for **Condensers** in Broadcast and Interference-Suppressing Technique, 498.
- Limiting Values, for Safety, for Interference-Suppressing **Condensers**.—Bühler, 1892.
- Tubular [Paper-Dielectric] **Condensers**.—Straford, 2754.
- Condensers**: see also Frequency-Drift, Stabilising.
- Automatic Contrast** Compression and Expansion free from Time-Lag and Distortion.—Lachner, 489.
- New Type of **Contrast** Control by Variable Negative Feedback.—Stevens, 488.
- Contrast**: see also Regulating.
- Philco "Mystery Control".—Herzog: Grammer, 509 & 510.
- Control**: see also Automatic, Contrast, Frequency-Response, Input, Remote, Threshold.
- Simple 5 . . . 20-Metre Converter for Home or Car.—Chapin, 2740.
- Non-Linear **Cross-Talk** in Multiple Systems with Transmitted Carriers.—Hözlter, 490.
- Crystals**: see Detectors, Filter, Phase-, Quartz.
- III-Effects of Certain "Current-Economising" Devices.—Mie, 123.
- Modern **Detector** Circuits.—Cocking, 4420.
- Anode-Bend **Detector** Circuit with Negative Feedback.—Köpke, 1869.
- Artificial Sphalerite as Best **Detector** for Wave-Guide Micro-Waves.—Reber, 1423.
- Crystals** in Micro-Wave Region.—Rotgardt, 113.
- Distortionless** Detection.—Varrell, 3940.
- Detectors**: see also Audion, Diode, Rectifying.
- Maximum Permissible **Detuning** of Broadcast Receivers.—Pevtsov, 974.
- "Movie Dial" in Ward Radio.—Chase, 1435.
- Reduction of **Diode-Detector** Distortion by Positive Bias, 2316.
- Behaviour of **Diode** Circuit to Interfering Low-Frequency and Direct-Current Voltages.—Bruck, 3125.
- Diode** Detector with Positive Bias.—Sturley, 1870.
- Distortion**: see Asymmetric-Sideband Automatic, Detection, Diode, Fading, Regulating.
- Diversity** with What You Have.—Taylor, 4386.
- Low-Cost Single-Signal Receiver: **Double Regeneration** for I.F. Selectivity and Image Reduction.—Grammer, 505.
- Universal Diversity Receiver [Hallicrafters **Dual-Diversity** Receiver].—Taylor, 1430.
- Dual-Diversity** Reception Simplified, and Simplified **Dual-Diversity** Radiotelegraph Reception.—Silver: Bartlett, 1877 & 4385.
- Dual-Diversity**: see also Diversity.
- Ear**: see Hearing.
- Elimination of **Echo** Signals by Long-Wire Antenna.—Nakagami & Miya, 4388.
- Hurricane **Emergency** Receiver: a Simple Battery Job.—Smith, 2327.
- The **Wireless World** Stand-By Three [Emergency Receiver], 2326.
- Broadcast Receivers at 1938 Berlin Exhibition.—Flanze, 982.
- Exhibitions**: see also Olympia, and under "Miscellaneous."
- Fading** Characteristics: Tuned Beam Antennas versus Half-Wave Dipoles.—Nakagami & Akazawa, 4387.
- Selective **Fading** in Broadcast Reception.—Feldtkeller & Mayer, 3933.
- Fading**: see also Dual-Diversity, Printing-Telegraph.
- Modern **Fasteners** in Radio Industry.—Walsh, 3559.
- "Systematische Fehlersuche" [Tracing of Faults] [Book Review].—Schadow, 1886.
- Peculiar **Faults** in Receivers, 512.
- Use of **Feedback** to Compensate for Vacuum-Tube Input-Capacitance Variations with Grid Bias.—Freeman, 975.
- Use of **Ferromagnetic** Materials in Coils for Radio Frequencies.—Koch, 3141.
- Full-Range Selectivity with 455-kc s Quartz-Crystal **Filters**: New Filter Circuit with Wide-Range Band-Width Control.—Oram, 502.

Reception—

- Filters** employing YT-Cut Quartz Plates.—Yoda & Kato, 4389.
Automatic Frequency Control : Directly Stabilised Oscillator, 3131.
The Monitor [giving Automatic Indication of **Frequency Drift**], 969.
Frequency-Drift Correction, 970.
Frequency-Drift Compensation [in Superheterodyne].—Levy, 3548.
Frequency-Modulation : Theory of Feedback Receiving Circuit, and Application of Negative Feedback to **Frequency-Modulation** Systems.—Carson : Chaffee, 4384.
Application of Negative Feedback to **Frequency-Modulation** Systems.—Chaffee, 3120.
Receiver for **Frequency Modulation**.—Day, 3542.
Noise-Free Radio Receiver for Reception of Frequency-Modulated Ultra-Short Waves.—Fyler & Worcester, 2742 & 3932.
Effect of Aperiodic Interference on the Reception of **Frequency-Modulated Signals** when a Current Limiter is used.—Pestryakov, 114.
Reduction of Interference by **Frequency Modulation**.—Plump, 115 & 491.
Theory of Valve Systems for Automatic **Frequency Regulation**.—Chistyakov, 126.
Frequency-Response Control Networks.—Ephraim, 4395.
Gas-Operated Radio within Reach of All.—Milnes Company, 3557.
Survey of **German Broadcast Receivers of 1939/40 Season**.—Moesbe, 4417.
Low-Cost Cure for Radio Interference [Copper-Oxide Glaze], 3938.
Remedies for **Hand-Capacity**, 121.
Headphone Listening for War-Time Conditions.—Wallace, 4410.
Mechanism of **Hearing** by Electrical Stimulation.—Stevens & Jones, 3119.
New **High-Fidelity Receiver**, 4414.
High-Fidelity Reproduction of Broadcast Programmes [and the Properties of the Ear], 3941.
The WQXR Receiver [High-Fidelity Receiver for Reception on Band-Width of 20 kc/s].—Lorenzen, 1431.
High-Fidelity Receiver for Local Reception.—Pacnet Company, 1884.
High-Fidelity : see also High-Quality, Local Distance.
Stepping-Up Receiver Performance : New Approach to Problems of **High- [and Ultra-High] Frequency Reception**.—Veatch & Kahle, 3543.
High-Quality Radio Reception.—Walsh, 4415.
Humidity : see also Noise.
Contribution to Study of Screening of **Ignition Circuits** of Aero Engines.—Marchisio, 962.
Capacity Component of **Ignition-Coil Discharge**.—Mochizuki & others, 4400.
New **Ignition Cable** cuts Radio Interference.—Peters, 495.
Ignition : see also Noise.
Input Control Circuit.—Waltz, 4393.
Valve Input Resistance : Importance at Wavelengths below 10 Metres.—Scroggie, 112.
Radioelectric Interference caused by High-Tension Insulators : ASE Tests.—Dick, 1880.
Interference.—Attwood, 2323 (Suppression & Car Performance) ; Blok, 1443 (from Electrical Apparatus—Production, Propagation, & Entrance) ; Dechange, 501 (Book-Review) ; Dennhardt, 117 (from Mercury-Vapour Rectifiers) ; Dennhardt & Stauss, 2320 (Action via Mains) ; Fomenko, 963 (Suppression by Blocking Condenser) ; Glas, 494 (I. caused by H.T. Installations) ; Goffin, 2321 (Cause of Scattering of Measurements by CISPR technique) ; Goffin & Marchal, 1439 (Generator of I-Voltages) ; Ingram, 4402 (Book-Review) ; Istituto Sperimentale, 3550 (Service Instructions) ; Kegel, 3123 (AEG Devices) & 3936 (Suppression, including I from Switches) ; Leithauser, 116 (in Switzerland : "Pro Radio" Association) ; Lenoire, 1442 (Tramways) ; Lyutov, 118 (Prevention of Propagation along Mains) ; Merriman & Nixon, 1444 (Work of Canadian Dept. of Transport) ; Moebes, 3937 (Special Case of I from Mercury-Rectifier Supply System) ; Mouroux, 1445 (Suppression at Receiver) ; Roehmann, 499 (References) ; Schilupp, 492 (Suppression at Trans. & Receiver, Short Waves) ; St. Dalios, 2322 (Elimination at Receivers) ; see also Amateur, Aviation, Condensers, Cross-Talk, Diode Echo, Frequency-Modulation, Glaze, Ignition, Insulators, Noise, Parasites (ic), Power-Networks, Radio-Influence, Razor, Remote-Control, Selectivity, Single-Sideband, Static, Time-Constants, Transformers, Ultra-Short.
Intermediate-Frequencies, Two : see High-Frequency.
Inversion Circuits.—Drabkina, 973.
Design of Transformers and Coils with **Iron Cores**.—Chistyakov, 515.
Contribution to Qualitative Theory of **Iron-Cored Choke Coils** with Superposed Magnetisation.—Haufig, 1874.
Advantages and Properties of Various Core Shapes for H.F. **Iron-Cored Coils**.—Hemmer, 3554.
Investigations on H.F. Coils with **Iron-Ribbon Cores** under Variable Superposed D.C. Magnetisation.—Maus, 1873.
Transformer Laminations without Waste of Material.—Käser, 2330.
Limiters : see Amplitude, Noise.
The World's Listeners : an Increase of Thirty-Three Millions.—Burrows, 3560.
New **Local Distance Circuit** [Advantages of Superheterodyne and Tuned R.F. Circuit].—White, 980.
Logarithmic : see Circuit-Performance.
Magnetic Tuning and Single-Span.—de Kramolin, 966.
Compensation Method for Eliminating Disturbing Influence of **Magnetic A.C. Fields**.—Schadwinkel, 120.
Modern Receivers for **Metric Waves**.—Baron, 960.
Micro-Waves : see Detector, Rectifying, Ultra-
Voltage-Dropping Resistance [in "Midget" Sets] : Possible Dangers.—Bland, 4407.
Longer Life for Dial Lamps : New Rectifier for American **Midgets**, 3140.
Mixing-Stage : see Oscillator, Short-Wave.
Modulation : see Audion, Phase-
New Method of Connection of **Multi-Grid Valve** for D.C. Amplification.—Boucke, 487.
Multivibrator for Ganging [in Alignment of Receivers].—Harris, 1436.
Negative Feedback in R-C Amplifiers, 122.
Use of **Negative Feedback** in Broadcast Receivers.—Aschenbrenner, 976.
Frequency Curve and Tendency to Oscillation of **Negative-Feedback** Amplifiers for Broadcast Receivers.—Bruck, 1868.
Negative-Feedback : see also Contrast, Detector, Feedback, Frequency-Modulation.
Negative-Resistance : see Contrast.
Receiver **Noise** [and Suggestions for Reduction].—Bell, 1879.
New Automatic **Noise Limiter** : Carrier-Controlled Squelch Circuit for Superhet Second Detectors.—Dickert, 496.
Simple **Noise Limiter** for Push-Pull Audio.—Mowery, 3552.
"Radio **Noise Reduction Handbook**" [Book Review].—Staff of Radio, 500.
Noise Suppressor Circuit for Heterodyne Receivers.—Richardson, 1881.
Noise Rejection Circuits.—Russell, 4398.
On Method of Reducing Impulsive **Noise** by Voltage Limiter.—Saneyosi, 1441.
A Signal-Metering Valve : Limitation of Signals and **Noise Peaks** in Receivers.—Taleni, 1440.
Noise Limiters [Use of Double-Diode].—Taylor, 961.
Noise : see also Frequency-Modulated, Interference, Pre-Amplifier, Printer.
Impressions of **Olympia** [Export Section : Band-Spreading : etc.], 4418.
Frequency Throw-Outs of **Oscillator** in Mixing Stage.—Kettel, 483.
Output-Stages : see Push-Pull.
Question of Industrial **Parasites** in Broadcast Reception.—Paolini, 3935.
Parasitic Rectification [by Imperfect Contacts].—"Log-Roller," 2319.
Parasitic-Oscillation : see Short-Wave.
Influence of **Parasitic Phenomena** on Reproduction of Acoustical Frequencies within Receiving Sets.—Di Roberto, 4396.
"Off-Neutralised Crystal-Filter Receiver" for **Phase-Modulated Waves**.—Crosby, 1878.
Philco : see Broadcast, Control, Remote.
Apparent Impedance of **Power Networks** at Broadcast Frequencies [in Connection with Interference].—Lev, 964.
Power Supply for Radio Receiver [including Thermo-Generators].—Beatt, 1887. See also 4409.
Vibrator **Power Supplies**.—Hall, 508.
Low-Noise H.F. **Pre-Amplifier** and AVC Pentode Type EF 13.—Ratheiser, 485.
Pre-Selection Pointers : Acorn Regenerative Unit for 14 : : 56 Mc/s.—Grimm, 2741.
Radio Programme **Pre-Selector**.—De Tar, 978.
Experiments on Radio **Teletprinter**.—Sugiyama & Nakata, 4403.
A Study of Wireless **Printing Telegraph** System, and Fading and Static Interference in Wireless Printing Telegraph.—Sugiyama, Yamamoto, Nakata, 2318.
Push-Button Tuning in a New Light, 2324.
Short Survey of **Push-Button Tuning**, 2752.
Radio Receivers with **Push-Button Tuning**.—Horowitz & van Lammeren, 1432.
Push-Button Tuning for Broadcast Receivers and Push-Button System of AEG Receivers.—Patzschke : Hering, 3942.
Single-Adjustment **Push-Button Tuner**.—Sprague Specialties, 3139.
Push-Pull Output Stages in Broadcast and Power Amplifiers.—Tillmann, 125.
Variable-Frequency **Quartz Crystals** for Superheterodyne Reception, etc.—Uda & Houda, 2315.
Quartz : see also Filters.
Radio-Influence Characteristics of Electrical Apparatus.—Bellaschi & Aggers, 497.
Radio Progress during 1938 : **Radio Receivers**.—I.R.E. Committee, 2756.
Radio Receiver as Part of Broadcast System.—Van Dyck, 2755.

Reception—

Radio Receivers and Amplifiers [Survey of Russian and Other Patents].—Govvadinov, 506.

Radio Receivers: see also Acoustical, Broadcast, Communication. Electric-Razor Interference, 2753, 3124 & 4401.

Receiver Characteristics of Special Significance to Broadcasters.—Foster, 4411.

Mechanics of Receiver Design: Temperature, Humidity, Vibration, 4405.

What Causes Good and Bad Reception? 132.

Weather Conditions and Radio Reception at Long Distances. Joshi, 131.

New Rectifying Mechanism for Centimetric Waves.—Döhler & Hecker, 4383.

Reflexed Amplifiers.—Watson, 3128.

Regeneration in the Superheterodyne.—Erskine-Maconochie, 3939.

Regimented Listening: Control from the Transmitting End, 3144.

Non-Linear Distortion due to Non-Linear Impedances in **Regulating Apparatus**.—Grigor'ev, Dulitski, & Egorov, 3129.

F.C.C. proposes Limit to Distance for **Radio Remote Control**, 511.

Remote Frequency Changer [Philco **Remote-Control System**].—Martin; Philco, 1871.

Remotely Controlled Receiver for Radiotelephone Systems [Ship-to-Shore].—Fischer, 2757.

Remote Control: see also Control, Remote-Tuning.

Remote Tuning of Communication Receivers.—Storm, 967.

Reproduction Levels (and Preservation of Tonal Balance), 4412.

Study of Attenuation of Ripples of Magnetic Field of D.C. Series Motor driven by Rectified Current.—Vasilii, 3551.

Creation of "Safety Mark" for Broadcast Apparatus.—U.S.E., 514.

Safety: see also Condenser, and under "Transmission."

Receiving Sets for Schools.—Whiting, 3136.

Receiver with Automatic Selectivity Control responsive to Interference.—Farrington, 2747.

Simplified Variable Selectivity.—Spencer, 1437.

Hetrofil—an Aid to Selectivity.—Woodward, 4392.

Selectivity: see also Aerial-Coupling, Double-Regeneration, Filters, Standardisation.

Limit of Sensitivity in Reception of Electric Waves, and Its Attainability.—Franz, 3126.

"**Wireless Servicing Manual**" [Book Review].—Cocking, 513.

"**Principles and Practice of Radio Servicing**" [Book Review].—Hicks, 4408.

Servicing: see also Components, Faults, Troubleshooter.

Ship-to-Shore: see Remotely-Controlled.

New Short-Wave Transatlantic Radio Receiver [Single-Sideband Speech Channels].—Bray & Lowry, 3555.

Short-Wave Oscillator Problems [Parasitic Oscillation in Frequency-Changers of Short-Wave Superheterodynes].—Cocking, 1425.

A.C. Short-Wave Three.—Dent, 133.

Single Sideband Receiver for **Short-Wave Telephone Service**.—Roetken, 1429.

Parasitic Oscillation in **Short-Wave Frequency-Changers**.—Sargrove, 4197.

Short-Wave S.F.R. Receiver Type B.R.C.1/8, 3556.

Modern Short-Wave Receiving Technique.—Strutt, 480.

Short-Wave: see also Hand-Capacity, Stammering-Signal.

Intelligibility and Liability to Interference in **Single-Sideband Reception**.—Haberkant & Meinel, 2743.

Single-Sideband: see also Short-Wave.

Single Signal—and Why.—Lewer, 124.

Single-Span: see Magnetic.

Sliding-Voltage: see AVC.

Smoothing: see Ripple.

Space Perception by Radio.—Meyer, 2746.

Stabilising Condensers [in American Receivers], 1876.

Stability of Triode-Oscillator with Grid-Condenser and Leak.—van Slooten, 1426.

A Stammering Signal [on Short Waves].—"Log-Roller", 3934.

Standardisation of Tests on Receivers, 972, 3135 & 4416.

Standardisation of Characteristics of Oscillating and Resonating Circuits used in Broadcast Receivers.—Adam, 3545.

Standardisation of Coils, Variable Condensers, and Scales.—Rothstein, 971.

"**Institute of Radio Engineers Standards 1938: Radio Receivers**" [Book Review], 3546.

Static: see Interference, Printing-Telegraph, and under "Atmospherics & Atmospheric Electricity."

Stereoscopic: see Space-Perception.

Design of Oscillator Circuit for **Superheterodyne Receivers**, 1427.

Constant-Frequency Superheterodyne Receiver.—Dueño, 4419.

Ultra-High-Frequency Superhet.—Heightman, 482.

Superhet Converter for 5- and 10 Metre Reception.—Lester, 2313.

Superheterodynes: see also Frequency-Drift, Quartz, Regeneration, Single-Signal, Stability.

Temperature and Humidity [Effect on Broadcast Receivers].—Scott, 127.

Compensation of Temperature Coefficient of Tuning Circuit.—Uemura, 2314.

Temperature: see also Receiver-Design, Reception.

Automatic Threshold Control for Radio-Telegraph and Telephone Receivers.—Hollingworth, 4394.

Measurement of Time Constants of Measuring Instruments [e.g. for Interference Tests].—Goffin & Marchal, 119.

Tone-Control Systems: Obtaining Variable Frequency Response.—Cocking, 3133.

Calculation of Tone Controls and Correcting Circuits.—Pitsch, 2325.

New Tone-Control Circuit.—Varrall, 2750.

Designing a Filament Transformer.—Dent, 984.

Reduction of Liability to Disturbance of **Transformers** by Use of Ring Transformers.—Schadwinkel, 493.

Application Possibilities of "Universal" Output Transformer.—Wünsch; Pitsch, 2329, 3142 & 3553.

Transformers: see also Iron-Cores, Laminations.

Receivers of To-day for **Transoceanic Communications**.—Kotowski, 2317.

Wireless in the Tropics, 4404.

"**Radio Troubleshooter's Handbook**" [Book Review].—Ghirardi, 3143.

"**A.B.C. of Automatic Tuning**" [Book Notice], 128.

Radios that Remember [General Electric "Time Tuning"], 136.

Multi-Band Tuning Indicators: Uses of Polarised Light, 1434.

Inductive Tuning: Design and Application.—Morelock; Ware, 1872 & 2739.

Resistance-Capacity Tuning.—Roberts, 2751.

Single-Knob Tuning in Superheterodyne Receiver.—Santoro, 981.

"**Frequency Stroke**" of Automatic Sharp Tuning.—Tixen, 1875.

Resistance-Capacity Tuning [Recent Developments].—Willans, 965.

Tuning: see also Coils, Control, Dial, Frequency-Regulation, Iron-Cores, Magnetic, Preselector, Push-Button, Remote, Standardisation, Temperature, Wattless-Retroaction.

Measurements of Range of Broadcast Reception Disturbances due to **Ultra-Short-Wave Medical Treatment Apparatus**.—Conrad & Schäfer, 4399.

Four Types of Interference encountered in **Ultra-Short-Wave Link** for Television.—Macnamara, 3121.

Ultra-Short: see also Aircraft, Arctic, Converter, Detector, Emergency, Frequency-Modulated, High-Frequency, Input-Resistance, Metric, Micro-Waves, Pre-Selection, Short-Wave, Superhet, Tuning (Inductive).

Valve-Performance: see Circuit-Design.

Valves with Wattless Retroaction as Adjustable Reactances [Automatic Tuning Correction].—Tixen, 3132.

Weather-Conditions: see Reception.

Power from Wind: Uses for Accumulator Charging.—Beatt, 4409.

Papers on Wire Broadcasting Systems, 2744.

The Wireless World Pre-Set Quality Receiver, 4413.

Wireless-World: see also Emergency.

AERIALS AND AERIAL SYSTEMS

Absorption: see Resonators.

Simplifying Adjustment of Antenna Arrays [Phase Monitor].—Morrison, 3566 & 3949.

Model Measurements on Fixed Aircraft Aerials for determining Radiation Characteristics in Short-Wave Range.—Harmening & Pfister, 2334.

Amateurs: see Long-Distance, Rotary.

Antennas [Short "Guest Editorial" Survey].—Beverage, 3945.

Simplified Discussion of Antennas and Antenna Feed Systems.—Ferrill, 521.

Theoretical Investigations into Transmitting and Receiving Qualities of **Antennae**.—Hallén, 2763.

Radio Progress during 1938: Transmitters and **Antennas**.—I.R.E., 2765.

Discussion on "Distribution of Ultra-High-Frequency Currents in Long Transmitting and Receiving **Antennae**."—Palmer & Gillard, 1451.

Investigations in Great Britain on Radiating and Receiving Properties of **Antennae**.—Smith-Rose, 2764.

[**Anti-Fading**] Aerial of Telefunken Broadcasting Station at Hörby.—Larsson, 2338.

Anti-Fading: see also Deutschlandsender.

Arrays: see Adjustment, Flat-, Radiation, Rotary, Short-Waves.

Calculation of Attenuation for Transmitting Aerials.—Wiechowski, 2339.

Measurement of Effective Height of **Automobile Antennas**.—Foster & Mountjoy, 2336.

Automobile: see also Car.

NBC Beam Antennas [Stationary System with Beam shiftable by Remote Control].—Godless, 2767.

"**Antennen. Ihre Theorie und Technik**" [Book Review].—Brückmann, 4443.

"**Institute of Radio Engineers Standards, 1938: Transmitters and Antennas**" [Book Review], 3569.

"**Kurzwellen-Antennen**" [Book Review].—Kollak & Wehde, 2335.

Broadcasting: see Anti-Fading, Efficiency, Impedance, Loop, Measurements, Reception.

Cables: see Coaxial, Feeder.

Aerials and Aerial Systems—

- Car Aerials** [Present Knowledge].—Strafford, 144.
Car: see also Automobile.
Coaxial Line Installation.—Epperson, 4429.
Coaxial Vertical Radiator: Improved Half-Wave Antenna System for Low-Angle Radiation.—Long, 1450.
 Another Inexpensive Seal for **Coaxial Cables**.—Morehouse, 3154.
Coaxial Antenna [for Ultra-Short Waves].—Western Electric, 1449.
Coaxial: see also Concentric, Feeder, Transmission-Line.
Community-Aerial Installations, Construction and Results.—Moebs, 2768.
High-Frequency Concentric Conductors.—RCA Patent, 141.
Conductivity: see Natural-Wavelength.
Conductor: see Forced-Oscillation.
Corona Voltage and Corona Loss of Double-Conductor Transmission Line.—Satoh & others, 2347.
Coupling System for Close-Spaced Antenna-Director.—Mobley: Stavrou, 2341.
Coupling: see also Parallel, Television.
Cylindrical: see Radiating (ion).
 Novel Aerial of Herzberg "Deutschlandsender," 3568.
Diameter: see Vertical.
 Choice between Horizontal and Vertical **Dipoles** when Minimum Earth Absorption is Required.—Niessen, 518.
Dipole: see also Field, Radiation.
 "Double Pitchfork" Antenna: Variable **Directivity** with Fixed Array.—Breuer, 3570.
Directive Progressive-Wave Aerial and Short-Wave Receiving Aerial Type G.—Gori: Niutta, 4437.
 Note on Particular Case of Multiple **Directive Aerials**.—Gori, 4438.
Directivity of "Inverted V" Antenna, and Its Applications.—Korekoda, 4442.
Directive Aerials for Very Short Waves.—Metschl, 1890.
Directional Aerial at Morioka Broadcasting Station.—Mitui, 4441.
 "Q" Beam Antenna: Two-Band **Directional System** with Non-Resonant Feeders.—Olander, 1452.
 Design of Aerial giving Predetermined **Directional Characteristic**.—Pistolkors, 2766.
Directivity: see also Beam, Coupling, Field-Strength, Horus, Long-Distance, Resonance, Vertical, Wave-Loop.
 New Experiments with "Earth Aerial" on Short Waves.—Schäfer, 4425.
Earthing [Reducing Resistance of Earth Connections].—Taylor, 2349.
Earth: see also Radiation.
 Elimination of **Echo Signals** by means of Long-Wire Antenna.—Nakagami & Miya, 4440.
Effective Height [Term tends to become Meaningless].—Strafford, 4427.
Effective Height: see also Automobile, Receiving.
 Measurement of Broadcast Coverage and Antenna Performance: Measurement of **Efficiency** of Antenna System.—Fitch & Duttera, 2337.
Energy: see Radiation.
 Comparison of **Fading Characteristics**: Tuned Beam Antennas versus Half-Wave Dipoles.—Nakagami & Akazawa, 4439.
Fading: see also Anti-Fading.
Aerial-Feeding Equipments in German Short-Wave Stations.—Buschbeck, 2344.
Long Feeders for Wide Sidebands, with Reference to Alexandra Palace System.—Cork & Pawsey, 2342.
Feeder Considerations: Losses in Tuned Lines and Adjustment of Flat Lines.—Goodman, 4431.
 Simple Transmission Theory relating to the Matching of Radio **Feeder Lines**.—Lynes, 988.
High-Frequency Feeders.—McLean, 2343.
High-Frequency Feeders consisting of Three Parallel Conductors.—Morita, 4426.
 Concentric Cable for Use as a Short-Wave Antenna **Feeder**.—Takeuchi & Abe, 4430.
Feeders: see also Antennas, Directional, Flat-Line, Impedance, Networks, Transmission-Line.
 General Solution for Intensity of Electromagnetic Field produced by Any Radiating Conductor.—Iwakata, 1456.
 Calculation of **Field Strength** on Short Waves, taking into Account Directivity of Transmitting Aerials in Vertical Plane.—Dolukhanov, 3562.
 Theory of Design of **Filters** constructed from Resonant Lines.—Mizuhasi, 140.
 "Double-Barrelled" Antenna System: Simplified **Flat-Line Feeding** for Two-Band Antenna.—Swift, 2346.
 Design of "Flat-Shooting" Antenna Arrays.—Haasen & Hollingsworth, 1892.
 Close-Spacing Antenna Arrays [to give "Flat-Top" Beams: etc.].—Kraus, 1459.
 Remarks on Paper by Suzant: "Forced Oscillations in a Conductor of Finite Length and Diameter."—Titov, 3153.
Frame Receiving Aerials [particularly in Field-Strength Measurement].—Koch, 4426.
 Superiority of Modified **Franklin Vertical-Beam Aerial** as regards Signal/Noise Ratio: etc.—Wood, 3149.
Frequency Bands: see Wide.
 Vibrations of Conductors of Electrical Energy covered by Layer of Hoar Frost.—L'hermite, 3574.
 Rectangular **Hollow-Pipe Radiators**.—Barrow & Greene, 1447.
 Electromagnetic **Horn Radiators**.—Barrow, 3561.
 Sectoral Electromagnetic **Horn, and Theory of Electromagnetic Horn**.—Barrow, Lewis, Chu, 1446.
 Electromagnetic **Horn Design**.—Chu & Barrow, 3944.
 Electromagnetic **Horns**.—Reber, 1889.
 Metal **Horns** as Directive Receivers of Ultra-Short Waves.—Southworth & King, 1888.
Impedance Measurements on Broadcast Antennas.—Sinclair, 4432.
Impedance of Divergent Two-Wire Circuits.—Groszkopf, 1893.
 Methods for obtaining Travelling Electromagnetic Waves (in a Line) without Loss of Power.—Neimann, 2772.
 Non-Uniform Lines with Distributed Constants.—Neimann, 987.
Lines: see also Coaxial, Transmission-Line, Vibrations.
 Fashions in Antennas [Types of Aerials used for Long-Distance Working by Amateurs].—Goodman, 3148.
 Critical Dimensions of Tuned Transmitting Circular **Loop Aerials**.—Banerjee, 1457.
 Shielded **Loop** for Noise Reduction in Broadcast Reception.—Goldman, 143.
 Steel Aerial **Mast** [Conduit Tube], 2348.
 Modern **Mast** Equipment for Radio Stations.—Ljungberg, 524.
Masts for Transmitting Stations.—Hill, 1897.
Matching: see Feeder.
Measurements at High Frequencies on Broadcasting Aerials.—Sinclair, 986.
Micro-Waves: see Directive, Hollow, Horn, Mirror, Resonance, Ultra-
 Investigations in Near Field of **Mirror** in Form of Paraboloid of Revolution.—Bach, 2758.
Models: see Aircraft, Vertical.
 Discussion on "Multiple Reflections between Two Tuned Receiving Antennae."—Palmer, Abson, & Barker: Brown, 3145.
 Influence of Electrical Conductivity of Surroundings on **Natural Wavelength** of Antenna.—Nakhla, 2762.
 Certain Properties of Dissymmetrical T Pure Reactance Networks, 2340.
 Certain Properties of Dissymmetrical T Pure Reactance Networks.—Cafferata, 3571.
 New Antenna System for **Noise Reduction**.—Landon & Reid, 2769.
Noise: see also Loop, Receiving, Reception, Signal.
 Radiation Resistance of an Aerial and **Nyquist's Theorem**.—Bell, 3151.
 Radiation Coupling of Straight **Parallel Wires** (in Particular for Progressive Waves).—Jachnow, 3948.
 Cathode-Ray Antenna **Phasemeter**.—Taylor, 4435.
Phase Meter, Monitor: see also Adjustment.
 Calculation of **Radiation Resistance** of Transmitting Aerials.—Afanasev, 519.
 Theory of **Radiating Cylindrical Conductor**.—Baudoux, 3565.
 Calculation of **Radiation Resistance** of Some Dipole Aerials.—Franz, 1891.
 Antenna **Radiation Chart** [with Discussion of Correction Factors].—Giacoletto, 4436.
Radiation in Earth from Hertzian Dipole.—Kato, 137.
 Useful **Radiation Power** of Beam Antennas.—Kato, 4434.
Radiation Resistance of Horizontal Dipole above Earth.—Lewin, 2332.
 Note on Calculation of **Radiation** from Cylindrical Antenna of Finite Diameter.—Nicolas, 3152.
 Calculation of **Energy Radiation** of Aerial Systems.—Oberhettinger: Pistolkors, 2333.
Radiation Relations for Ordinary Harmonic Dipoles and Partially Screened Harmonic Aerials.—Thoma, 1458.
Radiation (ors): see also Aircraft, Antennae, Hollow, Horn, Nyquist's, Resonators, Vector-Scalar.
 Receiving Impedance of a **Receiving Antenna**.—Niessen & de Vries, 3567.
Receiving Aerials [and Signal/Noise Ratio: Question of "Effective Height"].—Strafford, 142.
 Wire for **Receiving Aerials**.—Strafford, 520.
Receiving: see also Antennae, Community, Directive, Frame, Loop, Multiple-Reflections, Noise, Reception, Resonant, Teleceptor, Wave-Loop.
 Anti-Parasitic Aerial with Wide Frequency Range for **Reception** of Broadcasting.—Govvadinov, 985.
 Vertical or Inverted-"L" Aerials: Their Merits for **Reception** compared.—Strafford, 3147.
Re-Radiation: see Resonators.
 Electric **Resonance Chambers** [as Directional Radiators for Micro-Waves].—Reber, 1448.
Resonant Short-Wave Aerials, 3146.
 Absorption and Re-Radiation by **Resonators**.—Fountain & Pigg, 2761.
Retarded-Potential: see Field, Vector.
Rhombic: see Impedance, Travelling.
 Elaborate and Effective Amateur **Rotary Beam Aerial**.—Grammer, 523.

Aerials and Aerial Systems—

Rotary Beam Antennas: Lightweight and Inexpensive Supporting Frame adaptable to Several Types of Arrays.—Lynch, 522.
Two-Band Three-Element Rotary: a Close-Spaced Array for 20 m and 10 m Bands.—Schroeder, 3946.
Short-Wave Transmitting Aerials [at Davenport].—Haves, 3150.
Short Waves: see also Aircraft, Book-Review, Directive, Earth-Aerial, Feeders (ing), Field-Strength, Franklin, Long-Distance, Resonant.
Shunt-Excited Antenna used by Ultra-High-Frequency Station.—Miller, 4424.
Signal/Noise Ratio: see Franklin, Receiving Aerials.
Andrea Teleceptor [Television Receiving System with Low-Loss Transmission Line, etc.], 2760.
New Television [“Tilted-Wire”] Aerial, 4423.
Aerial Coupling Systems for Television.—Benham, 517.
Television Station has Radically Designed Antenna.—General Electric, 2331.
New Television Aerial [on Empire State Building].—Lindenblad, 2759.
Television Receiving Aerials.—Rosenstein, 4421.
 “Unit” Television Broadcast Receiving Aerial.—Rosenstein, 4422.
Tilted-Wire: see Television.
Twin-Tower Aerial System of B.B.C. Start Point Station, 1896.
Radio Tower Lighting Control.—Brott, 1898.
Wind Pressure on Tower Members.—Shichiri & Kynna, 1899.
High Frequency Transmission-Line Networks.—Alford, 1894.
Coaxial Transmission Line.—Bernard, 516.
Exponential Transmission Line.—Burrows, 1453.
Charts for Transmission-Line Measurements and Computations.—Carter, 2345.
New Coaxial Transmission Line at WTAM.—Duttera, 3572.
Applying Transmission-Line Theory to Aerials.—G.W.O.H.: Colebrook, 1455.
Localisation of Small Leaks in Underground Transmission-Line System at Cooling Radio Station.—Hall, Lloyd, & Richards, 3573.
Aluminium Coaxial Transmission Line [Gas-Filled].—Isolanite Company, 1895 & 2771.
Properties and Application of Tapered Radio-Frequency Transmission Lines.—Libby, 2770.
Transmission Lines with Exponential Taper.—Wheeler, 1454.
Transmission Lines: see also Coaxial, Corona, Filters, Line, Teleceptor.
Transmitting: see Antennae, Attenuation, Earth-Aerial, Loop, Radiation, Tower, Travelling-Waves, Vertical.
Rhombic and V Antennas excited by Travelling Waves.—Kato, 138.
Ultra-High-Short: see Antennae (-as), Coaxial, Directive, Feeders, Horn, Micro-Waves, Shunt-Excited, Television.
Generalisation of Vector-Scalar-Potential and Conduction Current viewed from Standpoint in Faraday-Maxwell Theory.—Oo, 4433.
Aerial Arrangement for Improving Polar Diagram of Half-Wave Vertical Aerials.—Berndt, 139.
Electrical Behaviour of Vertical Aerials in Relation to Their Diameter.—Rössler, Wilbig, & Vogt, 3564.
Vertical: see also Coaxial.
Vibrations of Power Lines in a Steady Wind.—Ruedy, 1900.
Vibrations: see also Frost.
The “Wave Loop” Aerial.—Pistolkors, 3563.
Aerial for Wide Frequency Bands.—Zisler, 3947.
Wind: see Tower, Vibrations.
Wire: see Receiving.

VALVES AND THERMIONICS

Adsorption: see Platinum, Surface-States.
New Valves in 1939/40 AEG Broadcast Receivers.—Felbaum, 3957.
“All-Glass” Valves.—Mullard Company, 1469.
New “All-Glass” Valve Construction.—Prakke, Jonker, & Strutt, 2774.
All-Glass: see also Footless, Secondary (Chrétien, Mullard).
Amplification Factor Chart.—Jervis, 3590.
Amplification: see also Durchgriff, Magnetic, Plate-Valve.
Predetermination of Performance of Radio-Frequency Amplifiers.—Rovs, 3168.
Amplifiers: see also Electron-Multiplier, Klystron, Power, Secondary, Wide-Band.
Variation of Anode Effect with Temperature.—Copland, 3958.
Autarchy in Thermionic Valve Industry. 4466.
Automatic Volume Control: see Diode, Regulating.
Surface Migration of Barium.—Benjamin & Jenkins, 153 & 551.
Vapour Pressure and Rate of Evaporation of Barium Oxide.—Blewett, Liebafsky, & Hennesly, 3982.
Barium: see also Contact.
Cathode-Ray Amplifier Tubes: Review of New Beam-Group Principle and Its Several Applications, 3575.
Beam: see also Electron-Stream, Energy-Equation, Frequency-Changing, Klystron, Limiter, Magnetrons, Secondary, Ultra-Valve, Velocity-Modulated.
Beryllium: see Secondary.
Indexed Bibliography of Electron Tubes and Their Applications.—McArthur, 169.

“Les Tubes à Vide et leurs Applications” [Book Review].—Barkhausen, 1920.
 “Getterstoffe und ihre Anwendung in der Hochvakuumtechnik” [Book Review].—Littmann, 1487.
 “Theory and Application of Electron Tubes” [Book Review].—Reich, 4471.
Book Reviews: see also Electronics, Fluctuations, Gaseous, Multi-Grid, Noise, Valves.
Broadcast Valve Programme 1938/1939.—Steinel, 168.
Cathode-ray Bunching [in Klystron].—Webster, 3950.
Caesium-Oxide: see Clean-Up.
Canal-Ray Discharge: see Clean-Up.
Capacitances: see Inter-Electrode.
Output Stage in Car Receivers with Valves EBC 11 and EDD 11.—Scheel, 541.
Carbonised: see Nickel.
Question of Oxide-Coated Cathode [Short Survey], 2365.
Discussion on Electron-Diffraction and Surface Structure [including Oxide-Coated Cathodes], 999.
Time Changes in Emission from Oxide-Coated Cathodes.—Blewett, 2800.
Electron Microscope for Study of Thermionic Emission of Pastes used for Cathodes of Valves and X-Ray & Cathode-Ray Tubes.—Gallarati, 2801.
Causes for Formation of Emission Centres on Surface of Oxide Cathodes.—Heinze & Wagener, 998.
Commercial Cathodes and Their Use in Practice.—Mie, 152.
Cathodes: see also Dispenser, Emission, Filament, Ions, Magnetron, Tungsten.
Cathode Ray: see Beam, Bunching, Cathodes, Characteristics, Electron, Ions (Negative).
Determination of Operating Characteristics of Power Vacuum Tubes.—Chaffer, 3167.
Use of Cathode-Ray Oscillograph for Determination of Transmitting-Valve Characteristics.—Douma & Zijlstra, 1476 & 4460.
Calculation of Characteristics of Electron Valves (Triodes).—Glostos, 150.
Characteristics: see also Contact-, Logarithmic, Measuring, Positive-Grid, Receiving, Testing, Transmitting, Triode.
Circle Diagrams for Tube Circuits.—Nims, 3589.
“Clean-Up” under Canal-Ray Discharge.—Chiplonkar, 2804.
Theory of Conductivity of Thermionic Valves.—Katzman, 2356.
Influence of Contact Potential on Characteristics of Receiving and Transmitting Valves.—Gesne and Wagener, 154.
Contact Difference of Potential between Barium and Magnesium.—Anderson, 552.
Comments concerning Anderson’s Paper on Contact Difference in Potential between Barium and Magnesium.—Cashman, 1001.
Correction to Date in “New Converter Tube for All-Wave Receivers.”—Herold & others, 2360.
Current-Economising: see AEG.
Currents to Conductors Induced by a Moving Point Charge.—Shockley, 149.
Cut-Off: see Diode.
Paths of Ions in Cyclotron.—Schiff, 2793.
Deflection Valves for Ultra-Short and Decimetre Waves.—Tiberio, 525.
Sharp Cut-Off in Vacuum Tubes [Equation for High-Vacuum Diode].—Aiken & Birdsall, 532.
Theory of Operation of Parallel-Plane Diode at High Frequencies.—Grünberg, 1464 & 1908.
Production of Ultra-High-Frequency Oscillations by means of Diodes.—Llewellyn & Bowen, 3155.
Properties of Biased Diode Rectifiers.—Williams & Fairweather, 4452.
Diodes: see also Fluctuation, Noise, Tube.
Dispenser Cathode: New Type of Thermionic Cathode for Gaseous Discharge Tubes.—Hull, 3961.
Inconstancy of “Durchgriff” and Cubical Distortions in Single-Grid Valves.—Holzwarth, 2357.
Inertia Measurements of Dynatron Effect.—Pesvatski, 3580.
Some Methods of studying Electron Paths in Design of Valves and Electron Multipliers.—Gallarati & Madia, 2792.
Emission of Electrons from Copper, Silver, and Aluminium on Impact of High-Velocity Ions.—Grassmann, 3964.
Representation of Planar Motion of Electrons in Magnetic and Electric Fields by Complex Vector Loci.—Kleinwächter, 4449.
Impedance Properties of Electron Streams.—Peterson, 4448.
Electrons: see also Cathode, Currents, Emission, Mechanical-Model, Multi-Grid, Positive-Ions, Space-Charge.
 “Fundamental Electronics and Vacuum Tubes” [Book Review].—Albert, 2783.
Electron-Microscopic: see Cathodes, Tungsten.
Grid-Controlled Secondary Electron Multiplier.—Chiba & Makino, 993.
Terminology of Technique of Secondary-Electron Multipliers.—Herold, 3581.
Development of Voltage Amplifiers operating on Principle of Electron-Multiplication.—Lepeshinskaya, 995.

Values and Thermionics—

- Secondary Electrons and Secondary-Electron Multipliers.—Peter, 4455.
- Electron Multiplier for Measuring Ionisation Currents.—Rann, 994.
- Initial-Current-Modulated Electron Multiplier as a "Super-Steep" Amplifying Valve.—Weiss & Peter, 1486.
- Electron-Multiplier : see also Secondary.
- Electron Emission [Mechanism of Activating Process for Dull Emitters : etc.]—Kollath & Mrowka, 1481.
- Thermionic Emission in Transmitting Tubes.—Marsden, 1482.
- Radiation of Matter accompanying Electron Beam Emission from Incandescent Cathodes.—Reichelt, 3585.
- Emission : see also Cathode, Electrons, Field, Filament, Positive-Ions, Secondary.
- New Form of Electromagnetic Energy Equation when Free Charged Particles are Present.—Tonks, 530.
- Range and Validity of Field Current Equation.—Abbott & Henderson, 3963.
- Field Currents at High and Low Pressures.—Alter & Murray, 2799.
- Electron Field Emission obtained from Bombardment of Aluminium Oxide by Electrons or Negative Ions.—Bojinesco, 3584.
- Variation of Field Electron Emission with Work Function.—Haefel, 1484.
- Energy Distribution in Field Emission.—Henderson & Dahlstrom, 2798.
- Field Emission from Stratified Cathodes on Irradiation by Electrons.—Mahl, 158.
- Oxide-Coated Filament : Relation between Thermionic Emission and Content of Free Alkaline-Earth Metal.—Prescott & Morrison, 1928.
- Filament Design for High-Power Transmitting Valves.—Vormer, 1000.
- Filaments : see also Cathode, Heat, Temperature.
- Report on Spontaneous Fluctuations of Current and Potential.—Bakker & van der Pol, 3165.
- Fluctuation Noise in Partially Saturated Diodes.—Bell, 3163.
- Fluctuation Theorem (Shot Effect).—Campbell : Rowland, 1477.
- "Spontaneous Fluctuations of Voltage due to Brownian Motions of Electricity. . . ." [Book Review].—Moullin, 1914.
- Report on Present State of Knowledge concerning Fluctuation Voltages in Electrical Networks and Thermionic Tubes.—Moullin : Spenke, 2788 & 4457.
- Fluctuations of Thermionic Current and "Flicker Effect."—Surdin, 3586.
- Representation and Computation of Fluctuation Voltages.—Williams, 3959.
- Fluctuations : see also Noise, Shot-Effect.
- Footless Valves : New Tungstram Range for Short [and Ultra-Short] Waves, 2775.
- Footless : see also All-Glass.
- Frequency-Changer Valves [Undesirable Effects in Short-Wave Reception].—James, 2359.
- Impulsive Theory of Hexode Frequency Changer.—Bedford, 538.
- New Frequency-Changing Valve.—Jonker & van Overbeek, 1472.
- Frequency-Changing : see also Noise, Valve.
- "Gammatron" Triodes for Generation of Ultra-Short Waves.—Société "Film et Radio," 3158.
- "Gaseous Electrical Conductors" [Book Review].—Wheatcroft, 1921.
- Gas-Filled : see Heat, Receiving, Transmitting (& other).
- Production of Large Ionic Currents in Gaseous-Discharge Magnetrans ("Gasomagnetrans"), and Theory of Ion Current in Magnetrans used as Source of Ions.—Vigdorichik : Sitnikov, 1907.
- Getters : see Book-Review.
- Grid Construction in Thermionic Valves.—Siemens & Halske, 997.
- New Metal for Grids.—Kennedy, 547.
- Influence of Grid Focusing Effect on Plate-Dissipation Limit of a Vacuum Tube.—Mourmoutseff, 1475.
- Convection and Conduction of Heat in Gases.—Brody & Körösy, 4472.
- Combination of Hydrodynamic Theory of Heat Transference with Langmuir Theory.—Elenbaas, 2369.
- Heating : see Hot-Spots, Temperature, Wires.
- Hexode : see Frequency-Changer, Tungstram.
- High-Velocity : see Electrons.
- Hot-Spots : see Grid-Focusing.
- Impulse Measuring Set [primarily for Measurement of Micro-phonicity].—Grant & Macnee, 4464.
- Induced Currents : see Currents.
- Inertia : see Dynatron.
- Importance of H.F. Input Valve.—Kerger, 1473.
- Input : see also Receiving, Ultra-High.
- Improvements in Measurement of Direct Inter-Electrode Capacitances of Vacuum Tubes.—Williams & Soukaras, 3169.
- New Process of Negative-Ion Formation.—Arnott & Beckett, 161.
- Emission of Negative Ions from Oxide Cathodes.—Broadway & Pearce, 2366.
- Formation of Negative Ions by Positive-Ion Impact on Surfaces.—Sloane & Press, 159 & 554.
- Formation of Negative Ions by Negative-Ion Bombardment of Surfaces : New Process.—Sloane & Cathcart, 2368.
- Formation of Negative Ions at Metal Surfaces.—Smith, 160.
- Ions : see also Cyclotron, Gasomagnetrans, Positive, Secondary.
- "Klystron" Generator for Micro-Waves, and Ultra-High-Frequency Power Amplifier of Novel Design.—Varian, Hansen & Haefel, 1902.
- High-Frequency Amplifier and Oscillator ["Klystron"].—Varian & Varian, 2773.
- Klystron : see also Beam-Group, Bunching, Micro-Waves.
- Industrial Production and Utilisation of Krypton, 4467.
- Krypton : see also Rare-Gases.
- Langmuir Theory : see Heat.
- Life : see Emission (1482), Filament.
- Amplitude-Limiter of Anode-Saturation Type.—Osawa, 2364.
- Valve Characteristics with Logarithmic Current Scale.—Bergtold, 172.
- Magnetic-Field Valves with Asymmetrically Slit Anodes.—Hamada & Simidu, 3951.
- Cathode Overheating in Magnetic-Field Valve.—Hülster, 1906.
- Variation of Amplification Factor of Thermionic Valves in Magnetic Field.—Joshi, 528.
- Magnetic : see also Electrons, Magnetron, Permatron.
- Magnetrons.—Chireix, 3578 (New Type); Dudnik, 3579 (M. for Centimetric Waves); Groszkowski & Ryzko, 145 (M. with Oxide-Coated Cathode); Hara, 2352 (Relation between Virtual Cathode & Potential Distribution); Hisida, 4446 (Theory of Asymmetrically Split M.); Kobayasi & Uchida, 1480 (New Water- and Air-Cooled Ms); K., U., & Harashima, 1904 (Radiation-Cooled M.); Lerbs & Lammchen, 1461 (Experimental Multiple Whole-Anode and 4-Split-Anode Ms); Okabe, 1461 (Electron-Beam Ms. and Type B M. Oscillations); Owaki & Suzuki, Okabe, 989 & 1905 (Sectionalised M.); Owaki, 4447 (Specially Sectionalised M.); Rosen, 146 (Characteristics as Function of Slot Angle). See also Gasomagnetrans, Magnetic, Mechanical-Model, Sentron, and under "Transmission."
- Precision Method for Measurement of Mutual Conductance of Thermionic Valves.—Astbury, 4462.
- Compensator for Radiation Method of Measuring Oscillator Efficiency.—Cowan, 4461.
- Thermionic Valves as Measuring Instruments.—James, Polgreen, and Warren, 1922.
- Bridge-Type Set for Measuring Vacuum-Tube Parameters.—Pernice, 1923.
- Method of Measuring Vacuum-Tube Coefficients.—Polk, 4463.
- Mechanical Model [Gyroscope] for Electron Motion in a Uniform Magnetic Field.—Rose, 3952.
- European Metal Valves.—Chrétien, 1471.
- American Metal Valves.—Isarev, 165.
- Metal : see also Steel.
- Microphonicity : see Impulse-Measuring, Pentode.
- Micro-Waves : see Beam, Bunching, Deflection, Diodes, Klystron, Power-Amplifier, Retarding-Field, Sentron, Ultra-, Velocity-Modulated.
- Multi-Purpose Midret Tubes.—Arcturus Company, 4450.
- The 1852 as a Mixer of Replacing the 6L7 in Regenerative S.S. Receiver, 3160.
- Frequency Throw-Outs of Oscillator in Mixing Stage.—Kettel, 542.
- Mixing Valve, ECH 11 with "Sliding" Screen-Grid Voltage.—Schiffel, 535.
- Zigzag and Helical Springs : Elastic Properties of Molybdenum.—Taney, 3173.
- Multi-Electrode Valve and Application in Scientific Instruments.—Lewis, 543.
- "Moderne Mehrgitter-Elektronenröhren" [Multi-Grid Valves : Book Notice].—Strutt, 544.
- Some Dynamic Measurements of Electronic Motion in Multi-Grid Valves.—Strutt & van der Ziel, 147 & 2791.
- Multi-Grid, -Electrode : see also Electron-Streams.
- Negative : see Ions.
- New Tubes (RCA & Arcturus), 4470.
- Carbonised Nickel for Radio Tubes.—Briggs, 548.
- "Théorie et Technique du Bruit de Fond" [Background Noise]. [Book Review].—Bedeau, 2787.
- The Noise in Secondary Emission.—Engbert, 155.
- Valve Noise at Low Frequency.—Graffunder, 3162.
- Report on Noise in Vacuum Tubes, and Report on Present State of Knowledge concerning Fluctuation Voltages in Electrical Networks and Thermionic Tubes.—Llewellyn : Moullin, 2788.
- Noise of Frequency-Changer Valves.—Lukacs, Preisach, & Szepesi : Bell, 537, 1478, 1913 & 2789.
- Noise Reduction by Means of Photoelectric Multipliers.—Preisach, 2790.
- Effect of Space Charge and Transit Time on the Shot Noise in Diodes.—Rack, 539.
- Noise : see also Fluctuation, Input, Nyquist's, Shot-Effect.
- Method for Measuring Non-Linearity of Valves.—Watanabe, Okamura, & Chouan, 151.
- Link between Shot Effect and Thermal Noise, by Nyquist's Theorem.—Bell, 3164.

Valves and Thermionics—

- Oscillations : see Plasma.
 Oscillograph : see Transmitting.
 Pentode and Tetrode Output Valves.—Jonker, 4459.
 Output-Stage Distortion : Measurements on Different Types of Output Valves.—van der Ven, 4458.
 Output : see also Car, Transmitting.
 Oxide-Coated : see Cathode, Filament, Magnetron, Pentode, Secondary.
 Modern Low-Power Transmitting Pentode : the S.F.R. P.16.—Bustarret & others, 2363.
 New Pentode with Oxide Cathode, with Useful Output of 500 Watts, and Complementary Information of the P.1000 Pentode.—Deroche, Stuart, Warnecke, 3161.
 Radiation-Cooled Telefunken Transmitting Pentodes.—Engelmann, 163.
 RCA-1609 [Low Microphonic Pentode] as a Triode.—Stewart, 1919.
 New Ultra-High-Frequency Pentode.—Zakarias, 1911.
 Pentodes : see also Output, Regulating, Single-Ended, Tungsten. [Receiver] Circuit Design related to Tube Performance.—Hollands, 3591.
 Permatron and Its Application in Industry, 2785, 3592 & 3593.
 Photoelectric-Multiplier : see Noise.
 Plasma Oscillations and Scattering in Low-Pressure Discharges.—Merrill & Webb, 2786.
 Variation of Amplification Factor in the "Plate" Valve.—Bode, 1002.
 Plate Dissipation : see Grid-Focusing.
 Adsorption of Oxygen and Hydrogen on Platinum and Removal of These Gases by Positive-Ion Bombardment.—Oatley, 553 & 2367.
 Point Charge : see Currents.
 Porcelain Pipe at WHAM [for Water-Cooling Installation].—Long, 173.
 Positive-Grid Characteristics of Triodes.—Porter, 531.
 Action of Positive Ions on Space-Charge-Limited Electron Current.—Bott, 3960.
 Positive Ions : see also Ions.
 Effect of Electron Transit Time on Efficiency of a Power Amplifier.—Haeff, 3954.
 Power-Amplifier : see also Klystron.
 Striking-Voltage Curves for Rare Gases at Low Pressures.—Klemperer, 162.
 New Receiving Valves at Exposition-Demonstration of Detached Pieces, Paris.—Adam, 1007.
 Input Resistance of R.F. Receiving Tubes : Effect on Circuit Gain and Selectivity at High Frequencies.—Grammer, 2778.
 Radio Progress during 1938 : Receiving Tubes and Gas-Filled Tubes.—I.R.E., 2784.
 Operating and Limiting Values of Receiving Valves, and Their Significance in Practice.—Neulen, 529.
 Recent Developments in Radio Receiving Tubes.—Wise, 3159.
 Receiving : see also Converter, Input, Mixer, New, Single-Ended, Tungsten.
 Differences and Parallels in Receiving- and Transmitting-Valve Technique.—Steimel, 1916.
 Rectifiers : see Diode.
 Regulating : see also AVC, Steel.
 Progress in Field of Regulating Valves.—Pitsch, 2361.
 Low-Noise Regulating [Variable-Mu] Pentode EF 13.—Ratheiser, 536.
 Low-Frequency Regulating Valve with Tuning Indicator, Type EFM 11.—Scheel, 534.
 Regulating Valves with "Sliding" Screen-Grid Voltage, Type EF 11.—Schiffel, 533.
 200 kW Valves with Replaceable Filaments, 4469.
 Influence of Space Charge in Plane Retarding Field.—Kleinsteuber, 3953.
 Temperature Scale for Rhodium.—Wahlin & Whitney, 1485.
 Rubber-Membrane : see Electron (Paths).
 Emission of Secondary Electrons from Metals bombarded with Protons.—Allen, 1926 & 2795.
 Valves with Directed Electron Paths and Secondary-Emission Valves.—Aschenbrenner, 3577.
 Secondary Electron Emission.—Bruining & de Boer, 549 & 4456.
 Electronic Valves with Secondary Emission.—Chrétien, 1467.
 Secondary Emission of Electrons from Sodium Filus coated with Gas.—Copeland, 3583.
 Comparison of Secondary Electron Emission due to H and D Ions.—Healea, 3172.
 Emission of Secondary Electrons under High-Energy Positive-Ion Bombardment.—Hill, Buechner, Clark, & Fisk, 2796.
 The Influence of Gases on the Secondary Emission of Certain Metals.—Khlebnikov, 996.
 Secondary-Electron Emission from Beryllium.—Kollath, 156.
 Experiments on Secondary Electron Emission.—Kollath, 1480.
 Dependence of Coefficient of Secondary Emission on Angle of Incidence of Primary Beam.—Lukjanov, Muller, 2355.
 Contribution to Technique of Measurement of Secondary Emission of Electrons.—Majewski, 3170.
 Secondary Electron Emission from Oxide-Coated Cathodes.—Morgulis & Nagorsky, 1925.
 Amplification by Secondary Emission.—Mullard, 1468.
 Phenomenon of Secondary-Electron Emission.—Nelson, 3171.
 Secondary Electron Emission from Thin Films.—Pesyatski, 3582.
 Amplification by Secondary-Electron Emission.—Rann, 4453.
 Measurements on Secondary Electrons emitted from "Recoll Nets."—Sandhagen, 157.
 Measurement of Secondary Emission in Valves, and S.E. Coefficients of Caesium-Oxide Surfaces.—Treloar, 550.
 Measurement of Secondary Emission in Valves.—Treloar, Pinciroli, 1924.
 Secondary-Emission Valve in an Amplifier.—Valecka, 4454.
 New Secondary-Emission Valve : Some Applications of Electron-Multiplier Principle.—Viller, 2354.
 Secondary Emission of Beryllium.—Warnecke & Lortie, 1927.
 Secondary : see also Electron-Multiplier, Noise, Tungsten.
 High-Efficiency Sentron.—Uda, Isida, Shoji, 990/1, 1903 & 2776.
 Temperature Response of Shot Effect of Valves with Oxide-Coated Cathode.—Szepei, 1479.
 Shot Effect : see also Noise, Nyquist's.
 "Single-Ended" R.F. Receiving Tubes.—546.
 Single-Ended R.F. Pentodes.—Kelley & Miller, 164.
 Sliding-Grid-Potential : see Mixing, Receiving (Adam), Regulating Valve.
 Effect of Space Charge in a Valve on Velocity of Electrons.—Zeitlenok, 540.
 Space Charge : see also Noise, Retarding-Field.
 Springs : see Molybdenum.
 Steel Valves : New German Productions compared with Glass and Earlier Metal Types.—Felix, 166.
 New Valve Technique : Steel Valves.—Gehrts, 1006.
 Regulating Properties of Steel-Valve Series.—Steimel & Schiffel, 167.
 Steel Series : see also Metal, Valve.
 Suppressor-Grid Modulation [and Western Electric 312A and 322A Valves].—Green, 1003.
 Surface States associated with a Periodic Potential, and Use of Surface States to explain Activated Adsorption.—Shockley : Pollard, 4473.
 Rate of Evaporation of Tantalum.—Langmuir & Malter, 2803.
 New Television-Amplifier Receiving Tubes 1851, 1852 & 1853.—Kauzmann, 1910.
 High-Frequency, Frequency-Changing, and Detector Stages of Television Receivers.—Strutt, 1909, 2353 & 2777.
 Calculation of Temperature of Incandescent Filaments.—Fischer, 1929.
 True Temperature Scale of Oxide-Coated Filament.—Prescott & Morrison, 1486.
 Temperature : see also Anode-Effect, Rhodium, Shot-Effect.
 Industrial Tube Terminology.—Gen. Elec. & Westinghouse, 170.
 Valve Testing Panel and measuring "Durchgriff," Slope, and Internal Resistance.—Hellmholz, 2358.
 Thin Films : see Secondary.
 Thorium : see Tungsten.
 Influence of Transit Time of Electrons in Valves.—Clavier, 1465.
 Transit-Time : see also Noise, Power-Amplifier.
 The Valves in a Transmitter.—Pisch, 1917.
 New Transmitting [and Other] Tubes, 545.
 Direct Oscillograph Recording of Volt/Ampere Characteristics of Transmitting Valves.—Boissinot, 3588.
 Transmitting Valves with Forced Air-Cooling.—van de Beek, 4468.
 Transmitting Tube Chart.—Dudley, 1005.
 Radio Valves : Consideration in Design of Transmitting and High Power Units.—General Electric, 527.
 Difficulties encountered in Measuring H.F. Output of Air-Cooled Transmitting Valves at Frequencies below 20 Mc/s.—Heyboer, 2781.
 Theory of Transmitting Amplifier.—Rothe, 1918.
 High-Power Transmitting Valves.—Walker & Tomlinson, 1915.
 Diagrams of Volt/Ampere Characteristics of Transmitting Valves, and On So-Called "Saturation" Current in Transmitting Valves with Incandescent Cathodes.—Warnecke, 3587.
 Transmitting : see also Characteristics, Emission, Filaments, Pentodes, Receiving-and-Transmitting, Replaceable-Filaments.
 Calculation of Triode Constants.—Fremlin, 3166.
 Analytical Characteristics of a Triode.—Teumin, 2780.
 Triodes : see also Characteristics, Pentode, Positive-Grid, Tube, Ultra-
 Contribution to Tube and Amplifier Theory.—Benham, 148 & 1474.
 Tubes, Inc. [Relations between Manufacturers and Customers], 1004.
 Tungstram EF8 Low-Noise Screened Hexode, and EF9 Pentode, 1912.
 Electron-Microscope Studies of Thoriated Tungsten.—Ahearn & Becker, 1483.
 Total Secondary-Electron Emission from Tungsten and Thorium-Coated Tungsten.—Coomes, 2797.
 Electrolytic "Polishing" of Tungsten.—Hughes & Coomes, 3966.
 Ionisation of Sodium Atoms on the Surface of Thoriated Tungsten and Its Effectiveness as a Method of Studying Film Cathodes.—Morgulis & Dyatlovitskaja, 2802.
 Thermionic Constants of Tungsten for Various Crystallographic Directions.—Nichols, 3965.

Values and Thermionics—

Temperature Dependence of Work Function of **Tungsten**.—Potter, 4474.
Tungsten : see also Emission, Field.
 The 356 A Vacuum Tube [for **Ultra-High** Frequencies], 3156.
Ultra-Short-Wave Oscillators.—Black, 4444.
Ultra-Short-Wave Generator Valves.—Hollmann, 526.
 Radio Progress during 1938 : **Ultra-High-Frequency** Tubes [and Circuits].—I.R.E., 2779.
 Triodes Type TW-530-B and LD-22-E, and Use for High-Power **Ultra-Short-Wave** Generation.—Kobayashi & Nishio, 992.
 Comparison of **Ultra-High-Frequency** Valves [Types 1231, 954, etc.].—Lester, 2351.
[Ultra-] Short-Wave Valves.—Posthumus, 4445.
 The VLS.381 **Ultra-High-Frequency** Triode of "Door-Knob" Construction.—Standard Telephones, 1462.
 Review of **Ultra-High-Frequency** Vacuum-Tube-Problems.—Thompson, 1463.
Ultra-High-Frequency Power Tube.—Western Electric, 3157.
 Push-Pull **Ultra-High-Frequency** Beam Tetrode [Type RCA 832].—Wing, 3955.
 Theory and Measurement of **Ultra-Short-Wave** Valves.—Zuhrt, 2350.
Ultra-High, Short : see also All-Glass, Deflection, Footless, Gammatron, Micro-Waves, Midget, Pentode, Power-Amplifier, Receiving, Single-Ended, Television, Transit-Time, Transmitter, Transmitting, Very-High-Voltages.
Vacuum : see Very-High-Voltages.
 The **Wireless World** Valve Data Supplement, 1938, 171.
 Recent Progress in Valves.—Decaux, 2362.
 Manufacture of Valves by Machinery.—Hall & Howe, 4465.
 "Hochfrequenztechnik" [Valves and Amplifiers : Book Review].—Kammerloher, 2782.
 The New Valve Programme.—Saic, 1470.
Valves : see also Bibliography, Broadcast, Conductivity, Durchgriff, Electron, Frequency, Measuring, Midget, Non-Linearity, Receiving, Secondary, Setron, Suppressor-Grid, Terminology, Testing, Triode, Tubes, Ultra, Wide-Band.
 Small-Signal Theory of **Velocity-Modulated** Electron Beams.—Hahn, 3576.
Velocity-Modulated Tubes.—Hahn & Metcalf, 1901.
Velocity : see also Space-Charge.
 Present-Day Technique of Vacuum Apparatus for **Very High Voltages**.—Matricon, 3956.
Water-Cooling : see Porcelain.
Wave Guides : see Diodes.
 Choice of Tubes for **Wide-Band** Amplifiers.—Pollack, 4451.
 Investigations on **Wires** heated by Electric Currents.—Fischer, 2794.
Work Function : see Contact, Field, Tungsten.

DIRECTIONAL WIRELESS

Accuracy of Direction Finders.—Smith-Rose & others, 2375.
 U- and H- **Adcock** Radio Direction-Finding Installations for Aviation.—Heer, 4475.
 Calibration of Four-Aerial **Adcock** Direction Finders.—Ross, 1933 & 3968.
Adcock : see also Sense-Finding, Very-Short.
Aircraft Direction Finding [Device for Air-Line Dispatchers], 181 & 557.
 Wireless Services for North Atlantic Air Routes.—Carr, 175.
Aircraft Radio, 1939.—Fink, 1489.
 Marconitrack **Aircraft** Radio Beacon System.—Furnival, 2372.
 Apparatus for Direction Finding in **Aircraft**.—Koch, 2371.
 Methods of **Aircraft** Wireless Navigation.—Metschl, 174.
 Range of Wireless Waves used on **Aircraft**.—Sylvester, 179.
 Recent Developments in **Aerial** Navigation.—Willis, 3181.
Air, Aircraft, Aviation : see also **Adcock**, **Alpine**, **Altimeter**, **Automatic**, **Blind-Landing**, **Compass**, **Ultra-Short**.
 Lorenz **Alpine** Radio Beacon for **Aircraft**, 4476.
 Principle of [Modulated Micro-Wave] Echo **Altimeter**.—A. T. & T., 560.
Radio Altimeter [Bell Laboratories], 561.
 Acoustic **Altimeter** for **Aircraft** [Survey].—Draper, 1015.
 Terrain Clearance Indicator [Radio **Altimeter**].—Espenschied & Newhouse, 1491 & 1931.
 Possible Application of Radio-Echo **Altimeter** to Aerial Map Making.—Espenschied & Newhouse, 2374.
 Reflection and Absorption of Electromagnetic Waves by Dielectric Strata [of Interest for **Altimeters**].—G.W.O.H.: Dallenbach & Kleinstuber : Pfister & Roth, 558 & 559.
Altimeter : see also **Aircraft** (1489), **Direct-Reading**.
 Report of Sub-Commission 4 : Direction-Finding on **Atmospherics**.—Watson Watt, 4480.
Automatic Direction Finder [Sperry-RCA], and The "Flightray" Multiple Indicator, 563.
Automatic Radiogoniometers : Method of Measuring Time Constants of Oscillating Circuits.—Marique, 1932.
 New **Automatic** Radiogoniometer with Visual Indication : "Radio-goniroscope."—Marique, 2370.

Automatic Navigator.—McGillivray, 1013.
Automatic Position Finder for Airplanes.—Roberts & McGillivray, 562.
Automatic : see also **Direct-Reading**, **Landing**, **Visual-Reading**.
 Radio in **Aviation** : General Survey, with Special Reference to Royal Air Force.—Hecht, 3973.
 500/135 Watt Tone-Modulated Radio **Beacon**, Type HB.1, 1934.
 Multiple Courses of Aeronautical Radio Range **Beacon**, and Causes.—Yonezawa & Hiraoka, 1010 & 1494.
Beacons : see also **Philips**, **Ultra-Short**.
 Straight-Line **Blind-Landing** System using Electromagnetic Horn.—Barrow & Lewis, 1488.
 Theory and Experience of **Blind Landing**.—Basim : Bendix Radio, 1490.
Blind Guiding and **Landing-Beam**, S.F.R. System : Installation of Toulouse-Francavals.—Gierd, 3598.
 New Four-Beam **Blind-Landing** System.—Hansell, 4477.
 Improvements in Lorenz **Blind Landing** System, 3597.
 Metcalf **Blind Landing** System for Airplanes.—Metcalf & others, 2373.
 Metcalf-MIT **Blind-Landing** System using Infra-Red or Micro-Wireless Waves, 177.
 "L.M.T." System of **Blind Landing**.—Perroux, 3180.
Blind Landing : see also **Aircraft**, **Klystron**, **Landing**, **Simon**, **Television**.
 "Wireless Direction Finding" [Book Review].—Keen, 182.
Calibration : see **Adcock**.
Cathode-Ray Goniometer-Type Direction Finder.—Tukada, 3967.
Cathode-Ray : see also **Sense-Finding**, **Visual-Reading**.
 Surface Radiation and "Vertical Effect" of **Closed** Aerials.—Sacco, 2807.
 Stark Position Finder for **Radio Compass** Work, and Stark Position Finder for Wireless Navigation, 180.
Radio Compass [Survey of Principles], 2809.
Compass : see also **Indicating**.
Decimetric : see **Detection**, **Micro-Waves**.
 Production of Decimetric Waves of High Power, and Application to **Detection** of Obstacles.—Gutton, 2805.
Detection of Obstacles to Navigation without Visibility.—Éeil, Gutton, Hugon, & Poute, 3174.
Dielectric Strata : see **Altimeters**.
 New Data on **Direction** of [Short-] Wave Propagation.—Feldman, 556.
Directional Observations of GNO 11 605 kc/s from Great Britain received in Japan.—Ohno, Nakagami, & Miya, 1011.
 Demonstration of Various Methods of **Radio Direction Finding** with a Small Short-Wave Emitter.—Ristau, 1493.
 Investigations in Great Britain on Behaviour of **Direction-Finding** Installations.—Smith-Rose, 2808.
 Symposium on **Radio Direction Finding** : Introductory Remarks.—Smith-Rose, 3969.
 Recent Trend of **Radio Direction Finding**.—Smith-Rose, 3970.
Direction Finding : see also **Accuracy**, **Adcock**, **Aircraft**, **Automatic**, **Book Review**, **Cathode-Ray**, **Direct-Reading**, **Errors**, **Non-Linear**, **Sense**, **Sensitivity**, **Ultra-Short**, **Visual-Reading**, **Whaling**, **Yacht**.
Direct-Reading Radiogoniometer [applicable as Altimeter for Landing].—Lévy, 1014.
 Radio-Interference **Distance** Meters and Results of **Distance** Measurements obtained under Actual Conditions.—Schegolev, 3178.
 Measurement of **Distances** by **Ultra-Short** Waves (Wireless Range-Finding).—Tiberio, 3175 & 3594.
Distances : see also **Detection**, **Interference**.
Errors in Radiogoniometers [particularly Aperiodic Tight-Coupled Type].—Smith & Hatch, 178.
Errors : see also **Accuracy**, **Direction**, **Ground-&Ionospheric**.
 Radio Fog Signals at Sea [Trial in Boston Harbour], 1935.
 Correction to Curves in "Ground and Ionospheric Waves."—Ross, 4479.
Horn Radiators : see **Aerial**, **Aircraft** (1489), **Blind-Landing**.
 Special **Direction-Indicating** Devices of Luminous Type for Use with Inductor Compasses for **Aerial** Navigation.—Giulietti, 2376.
Indicator : see **Automatic**, **Direct-Reading**, **Non-Linear**, **Scanning**, **Visual-Reading**.
Infra-Red : see **Blind-Landing** (177).
Interference Method for Investigation of Propagation of Electromagnetic Waves.—Mandelstam, 3176.
 Application of **Radio-Interference** Methods.—Papalexis, 3177.
Interference : see also **Distance**.
 "Klystron" **Ultra-High-Frequency** Generator applied to **Blind** Landing Beams (Horn Projector), 3595.
 Government Man patents **Automatic Landing** System.—Dunmore, 1930.
Landing : see also **Blind-Landing**.
Loop Aerials : see **Closed**, **Ultra-Short**.
Map Making : see **Altimeter**.
Micro-Waves : see **Aircraft**, **Altimeter**, **Blind-Landing**, **Detection**, **Ultra-Short**.
Navigator : see **Automatic**.

Directional Wireless—

Direction Finding: Improvement in Quality of Observations by Use of **Non-Linear Amplifiers** [or Indicating Meters].—Ross & Burgess, 4478.
Obstacles: see also Detection.
Philips Marine Beacon Transmitter BRA 070/7, 4481.
Position Finders: see Automatic, Compass.
Radiogoniometers: see Automatic, Direct, Direction-Finding, Errors.
Range, Range-Finding: see Aircraft, Distances.
Reflection: see Altimeters.
 Indicating Arrangement for Short-Time Measuring Apparatus, based on Exploring Ray **Scanning**.—Winckel, 3971.
Scanning: see also Television.
Sense-Finding Device for Use with Spaced-Aerial Direction Finders.—Fereday, 1492.
 Calculating **Sensitivity** of Radio Direction Finder.—Khesin, 555.
Short Wave: see Direction, Direction-Finding.
 Flight Tests of **Simon Radio Guide**, 178.
Spaced-Aerial-Frame: see Sense-Finding, Visual-Reading.
 Television applied to Blind Landing by the R.C.A., 3596.
 Steering by **Television**, 3972.
Television: see also Scanning.
Terrain Clearance: see Altimeter.
 Loop Direction Finder for **Ultra-Short Waves**.—Hopkins, 1008.
 Possibilities of **Ultra-Short Waves** for Air Navigation [and Three-Beam Beacon System].—Kolster, 3179.
 Philips **Ultra-Short Wave Beacon BKA 200/8**.—Volz & de Jager, 2846.
Ultra-Short: see also Air, Aircraft, Aviation, Altimeter, Distances, Micro-Waves, Very Short.
 Direction Finding of **Very Short Radio Waves** of 20 to 50 Megacycles per Second.—Maeda & Nishikori, 1009.
Visual-Reading Direction Finder for Rotating Spaced-Frame or Other Aerial System.—Falcon, 1012.
Whaling and Wireless [Use of Direction Finding], 4483.
Yacht D.F. Set: Long-Wave Receiver for Weather Forecasts and Position Finding.—Devereux, 4482.

ACOUSTICS AND AUDIO-FREQUENCIES

Theory and Design of Simplest Resonance Sound-Absorbing Systems.—Rschewkin, 3995.
Absorption.—Allman, 609 (A. & Reflection Coefficients in Gases); Knudsen & Fricke, 608 & 1571 (A. in Carbon Dioxide, etc.); Konstantinov, 3992 (A. on Reflection from Solid Boundary); Meyer & Schoch, 2412 (Measurements on A. Percentages); Power, 1542 (in Rooms with Absorbing Ceilings); Rogers, 3205 (A. by Vibrating Plates backed by Air-Space); Sabine & Ranier, 1555 (A. Effects in Sound-Transmission Measurements); Vermeulen, 1541 (Auditorium Acoustics). See also Absorptivities, Bricks, Halls, Impedances, Relaxation, Resonators, Reverberation, Snow, Studios, Transmission, Tubes.
 Theoretical Determination of Sound **Absorptivities** by Impedance Method, and Comparison of Sound **Absorption** Coefficients obtained by Different Methods.—Leedy: Willig, 3206.
Acoustic: see Absorption, Architectural, Lengths, Relaxation, Room, Testing, Transverse, Visual.
 Frequency and Sound-Strength Measurements on **Aeolian Tones**.—Holle, 1047.
 Experimental Foundations of Development of Acoustic Air-Jet Generator.—Hartmann & von Mathes, 2419.
 Construction, Performance, and Design of Acoustic Air-Jet Generator.—Hartmann, 2835.
 Calculation of Sound Field of **Air-Screw**.—Ernsthausen & Willms, 2407.
 Photography of **Air-Screw Sound Waves**.—Hilton, 1058.
 Acoustic **Altimeter** for Aircraft.—Draper, 1062.
Amplification of Wide-Band Modulated Waves at Transmitter and Receiver: HEFOD System.—Havasi, 2378.
Amplifiers.—Alexander & Shorter, 196 (Microphone As.); Amplifier Company, 4508 (High-Fidelity); Brewer, 1037 (Automatic Remote A.); Davis, 1515 (Limiting A.); Day & Russell, 201 (Corrections to "Practical Feedback As."); Duncan, 4507 (Remote A.); Feldtkeller, 1040 (Anode Choke in Push-Pull A.); Gates & Collins, 1514 (Limiting As.); Harley, 1038 (Bridging A.); Mayer, 2822 (Control of Effective Impedance by Feedback); Owendoff, 1039 (for Broadcast Studio); Owens, 3189 (Pre-Mixing); Partridge, 3194 (Are Straight-Line As. worth while?); Pozzi, 4506 (Valves for As.); Roberts, 583 (Stabilised Regenerative As.); Schadwinkel, 2382 (for 3 Separate Channels); Sturm, 2383 (Bass Accentuation).
Amplifiers, Amplification: see also Book-Review, Distortion, Echo, Gramophone, Output, Programme-A., Sound-Illusion, Template.
Amplitude-Range Control, and Devices for controlling **Amplitude** Characteristics of Telephonic Signals.—Wright: Norwine, 577 & 1955.
 Mechanical and Electrical Analogies of Acoustical Path.—Saxton, 3212.

Sound Analyser and A.F. Oscillator using Degenerative Amplifier to give Highly Selective Circuit.—General Radio: Scott, 2827.
Analysis: see also Diffraction, Ear, Frequency, Harmonic, Microphotometer, Musical, Noise, Phases, Resonance-Disc.
Aphonic Room of General Electric Research Laboratory.—McMahan, 1971.
AVC by Applause [Patent], 569.
Arc Reflectors as Source of Disturbing Sounds in Studios.—Müller, 4498.
Architect: see Loudspeaker (Flat).
Architectural Acoustics and Electrotechnics.—Gigli, 3999.
 Improving **Articulation Quality** of Transmission Channel by Use of Special Frequency Characteristics.—Tetelbaum & Vollmer, 1022.
Angiognomy in Air and under Water, and Cause of Corrosion of Diaphragm, vibrating in Water.—Federici, 4012.
Modern Audiometer.—Penther, 4528.
 Frequency of Alternating Current and Pitch of Tone during Electrical Stimulation on Auditory Apparatus.—Arapova & Gersuni, 210.
Auditory: see also Hearing.
Auscultation: see Structures.
Automatic Audio-Frequency Response Recorder and Some Applications.—Olney, 3609.
 Equipment for **Automatic Measurement** of Audio-Frequency Circuits.—Columbia Broadcasting, 3213.
Automatic: see also Amplitude, Applause, Compressors, Dynamic, Limiters.
 WQXR High-Fidelity Receiver with **Baffle Plates** in Front of Cone, etc.—Wilmette, 1502.
B.B.C. Recording Service, 1948 & 1949.
 Sound of **Bells**: Secondary Strike Note.—Arts, 3199.
 On Piezoelectric Measurement of Absolute Threshold of Audibility in Bone Conduction.—von Békésy, 2417.
Book Reviews.—Aard, of Motion P. etc., 1508 (Motion-Picture Sound Engineering); Bergmann, 634 (Ultrasonics & Applications); Engl, 4000 (German Text Book for Architects & Engineers); Greenlees, 582 (Amplification & Distribution of Sound); Grober & others, 592 (Noise in Ventilation Engineering); Hémardiquet, 1972 (Acoustic & Electroacoustic Practice); Institute of Rad. Eng., 3623 (Standards); Meyer, 4001 (Electroacoustics); Olson & Massa, 4531 (Applied Acoustics); Stevens & Davis, 604 (Hearing: Psychology & Physiology).
 Acoustic Properties of **Mud Bricks**.—Constable & Mahas, 3994.
 Effect of Stray Admittances in **Four-Arm Bridge Networks**.—Astbury, 205.
 New **Broadcasting House** at Brussels.—Colborn, 207 & 2380.
Broadcasting: see also Recording, Studios, Transducer.
Building-In of Loudspeakers.—Furrer, 4487.
 Reply to Discussions on "Modern Systems of Multi-Channel Telephony on **Cables**."—Angwin & Mack, 578.
 Telephony and Television by Coaxial **Cables**.—van Mierlo, 4515.
 Elements of Electrical Resistance of Conductors in Telephone **Cables** and Their Variations.—Rouault, 1036.
Cables: see also Music-Channels, Speech-Circuits.
 Absolute **Calibration** of Microphones.—Ernsthausen, 2384.
Calibration of Microphones and Testing of Loudspeakers: Standardisation of Measuring Methods.—German Committee, 2385.
Calibration of [Condenser] Microphone with Rayleigh Disc.—Kelkar, 1032.
 Corbino Method of **Calibrating** Electrostatic Microphones applied to Electrodynamic Loudspeakers.—Santoro, 3608.
Carbon Microphones.—Braun, 1030 & 2816 (Non-Linear Distortion, New Theory: Combination Oscillations & Dying-Out Processes); McMillan, 1031 (Theory of Operation) & 1521 (Equalising the Frequency Characteristic); Nakagami, 194 (Non-Linear Distortion, New Theory); Yakoulev, 195 (The E.M.F. of a C.M).
 Probability of Linear and Non-Linear Voltages occurring in **Carrier-Frequency Multiple Systems**.—Jacoby & Günther, 1546.
 Calculation and Measurement of Non-Linear Distortions in **Carrier-Frequency Transmission Systems**.—Tischner, 1547.
 Non-Linear Distortion and Cross-Talk Frequency Groups in **Multiple Carrier Transmission**.—Yonezawa, 579.
Cathode-Ray Oscillograph: see Directivity, Reverberation.
Chladni Patterns on Circular Plates.—Colwell, Stewart, & Friend, 2811.
 Excitation of **Chladni Figures**.—Sibaiva, 4010.
Chladni: see also Plates-&Membranes.
 Locus Curves of Resistance of **Coils** with Iron Cores.—Braun, 3981.
Combination Tones in Sound and Light.—Bragg, 2388.
Combination Tones in Non-Linear Systems.—Massa, 209.
 More on **Combination Tones**: Table for Power Series Calculations.—McFarland: Massa, 1966.
 Papers on Automatic Volume **Compression** and Expansion.—Weber: Grigor'ev, Dulitski, & Egorov, 192.
Compression: see also Amplifier, Amplitude, Contrast, Crosstalk.
 Cone Sound Projector using Output of Both Sides of Cone Diaphragm.—University Laboratories, 4485.
 Resonance in Truncated **Cones**.—Bate & Wilson, 185.

Acoustics and Audio-Frequencies—

- Long-Distance Conference System.—Etheridge, 1512.
Contrast : see Compression, Disc, Dynamic.
 Reduction of **Crosstalk** on Trunk Circuits, by Use of Compressor and Expander.—Lawton, 3613.
 Internal Friction of Metallic Crystals.—Read, 619.
 Resonant Radial Frequencies of Cylinder with Any Wall Thickness.—Field, 3979.
Decay : see Logarithmic.
 Linear Decibel Meter using Cuprous Oxide.—Akazawa & Uno, 4530.
 Direct-Reading Depth-Meter for piloting Ships in Rivers.—Matsuo, 1061.
 Making a Curved Diaphragm.—Brewer, 184.
 Indicial Acoustical Resistance of Piston Diaphragm.—Kharkevitch, 1937.
 Acoustic Spectra obtained by Diffraction of Light from Sound Films.—Brown & others, 2402 & 2826.
 Diffraction of Waves by Ribbons and by Slits.—Morse & Rubenstein, 1046.
 Diffraction produced by Cylindrical and Cubical Obstacles and Circular and Square Plates.—Muller, Black, & Davis, 588.
 Diffraction of Light by Sound Film.—Schouten, 1549.
Diffraction : see also Supersonic.
 Direct Observation of Directivity Curve on a Braun Tube.—Morita & Sittzyo, 4484.
Directivity : see also Impulsive, Microphones.
 Idea in Disc Labels [Stroboscopic Disc], 567.
 Contribution to Theory of Gramophone Disc Record : Pick-Up Process.—Bierl, 4491.
 Sound-on-Disc Recording.—Brooker, 1026.
 Lateral Disc Recording for Immediate Playback with Extended Frequency and Volume Range.—Hasbrouck, 2818.
 Advanced Disc Recording.—LeBel, 1027.
 Recording Discs [Cellulose-Lacquer].—Lindström, 1946.
Discs : see also Recorder, Recording.
Distance : see Localisation.
 Wave-Shape Plots for checking Amplifier Distortion, 2821.
 Measurement of Harmonic Distortion.—Ellis & Mayo, 580.
Distortion : see also Amplifier, Carrier, Gramophone, Inversion, Loudspeakers, Non-Linear, Optical, Output-Stage, Tone-Fluctuation, Transformer.
 Equivalent Values of Distributed Constants.—Kharkevitch, 1938.
 Sound-Level Distribution Recorder.—Kahl, 3202.
 Distribution System for Loudspeaker Transmissions at Berlin Trunk Exchange.—Kurtz, 1034.
 Devices for Widening Dynamic Range.—Govyadinov & Sobolev, 1023.
 Correct Mode of Action of "Dynamic Regulator."—Hildebrandt, 1953.
 Notes on Dynamics of Instruments.—Rich, 4004.
 Sound Analysis in Human Ear from Standpoint of Various Theories of Hearing.—Hildebrandt, 1537.
 Ohm's Fundamental Acoustical Law and New Views on Sound Analysis by Ear.—Trendelenburg, 3615.
Ear : see also Auditory, Hearing, Localisation, Resonance.
 Note on New Notion of "Écart diaphonique" [CCIF, Oslo Meeting].—Simon, 1556.
 Echo- and Feedback-Blocked Duplex Traffic Connections with Amplifiers.—Kimmel, 193.
 Contribution to Electrical Recording of Echoes.—Torelli, 3209.
Echo Sounding [Recent Equipments], 1060.
Echo, Echo-Sounding : see also Altimeter, Depth-Meter, Magnetostriktion, Ranging, Reverberation, Scanning, Supersonic.
 Frequency Distribution of Eigen tones in Three-Dimensional Continuum, and Distribution of Eigen tones in Rectangular Chamber at Low Frequency Range.—Boit : Maa, 1539 & 2829.
 Plastic Elastic State.—Bennewitz & Rötger, 4018.
 New Method of Measuring Elastic Constants of Transparent Isotropic Solid Bodies.—Hoesch, 616.
 Thermal Dependence of Elasticity in Solids.—Brillouin, 1057 & 4008.
Elasticity : see also Rigidity.
Electrical Stimulation : see Auditory.
 Discussion on Electroacoustics.—Drysdale & others, 2391.
 Radio Progress during 1938 : Electroacoustics.—I.R.L., 2831.
 Electroacoustic Installation in League of Nations Palace in Geneva.—Voorhoeve & Bourdrez, 1510.
 Representation of Electro-Mechanical Apparatus by Electrical Equivalent-Circuit Diagrams.—Lang, 4489.
 Public Address System at Eucharistic Congress, Budapest.—de Czegédy, 4510.
Expander : see Compression, Dynamic.
 Explanation of Propagation of Explosion Waves at Boundary between Two Media.—Joos & Teltow, 2832.
 Propagation of Explosion Waves in Liquids and Solid Bodies.—von Schmidt, 1575.
Feedback : see Echo.
 Acoustic Filters and Their Possible Application for Elimination of Noise.—Rama, 2410.
 Filtration of Sound.—Lindsay, 100.
Flames : see Jets, Singing.
 Internal Friction of Solid Bodies : Thermal Damping in Flexural Oscillations.—Bennewitz & Rötger, 1573.
 Frequency Ratios of Tempered Scale.—Williamson, 1534.
Frequency : see also Eigen tones, Stroboscope, Tuning-Fork.
 Frequency Analyser of Directly Viewing Type.—Hayashi & Kosaki, 2403.
 Method for obtaining Frequency Characteristics.—Riinski-Korsakov & Shumova, 1951.
 "Frequency Discrimination" in Insects : New Theory.—Pumphrey & Rawdon-Smith, 3220.
Friction : see Crystals, Flexural, Grain, Vibration, Wood.
 Calculation and Construction of Note-Adjusting Condensers for Beat-Note Generators.—Nusslein, 1960.
 Calculation of Variable Condensers of a Howling-Tone Heterodyne Generator.—Tamberg, 2404.
Generators : see also Air-Jet, Low-Frequency, Oscillator, Siren.
 Dependence of Internal Friction in Metals on Grain Size.—Randall, Rose & Zener, 4009.
 Non-Linear Distortion, in Reproduction of Gramophone Records resulting from Pick-Up Tracking Errors.—Löfgren, 1025.
 Brief Experiments on "Almité" Gramophone Record.—Miyata, 2819.
 Electric Gramophone [for Highest Quality].—Scroggie, 2820 & 3982.
 Bibliography on Recording [and Reproduction, of Gramophone Records].—Sperling, 1505.
Gramophone : see also Disc, Oscillator, Oscilloscope, Pick-Up, Record-Player, Recorder, Recording, Reproduction, Talking-Books, Tape.
 Problem of Sound in Large Halls.—Mollica, 3618.
 Force-Time Law governing Impact of Hammer on Stretched String.—Davy, Littlewood, & McCaig, 1528.
 Method for Harmonic Analysis of Alternating Currents.—Gambetta, 4007.
Harmonic : see also Analyser, Distortion, Phases.
 Mechanism of Hearing as revealed through Experiment on Masking Effect of Thermal Noise.—Fletcher, 602.
 Improved Hearing Aid.—I tter, 1033.
 Mechanism of Hearing by Electrical Stimulation.—Stevens & Jones, 3218.
Hearing : see also Audiometer, Auditory, Bone-Conduction, Book-Review, Ear, Localisation, Subjective, Threshold.
 Indoor and Outdoor Response of Exponential Horn.—Boner, Wayne Jones, & Cunningham, 1500.
 Indicial Impedance of Certain Infinite Horns.—Kharkevitch, 2392.
 Design for Exponential Horns of Square Cross Section.—Logan, 1941.
 Acoustic Folded-Horn Design.—Sanial, 1501.
 Acoustic Effects of Humidity in Gases.—Pelemeier : Saxton, 607.
 Bridge for Direct Measurement of Impedances.—Chrétien, 4524.
 Construction and Properties of Adjustable Acoustic Resonance Impedance.—Schuster & Stohr, 4523.
 Measurement of Acoustic Impedances.—Wisotzky, 2413.
 Damping of Flat Impulses of Small Amplitude.—Shmushkevich, 2812.
Impulse Measuring Set.—Grant & Macnee, 4521.
 Directivity of Sound Source by Impulsive Waves.—Chiba & Morita, 1942.
Intra-Red : see Supersonic.
 Sound Insulation.—Constable, 1041.
 Insulation of Air-Borne Sound : Application of Laboratory Results to Practical Building Problems.—Morreau, 590.
Insulation : see also Walls-&Floors.
 Experimental Consideration on Sound-Intensity Measuring Set of Hot-Wire Type with Thermocouple.—Kobayashi & Hayashi, 1944.
 Single-Tube Intercommunicator.—Deitz, 4513.
 "Inversion" of Sound Waves of Large Amplitude.—Mjasnikov, 2387.
 Jets Musically Inclined.—Brown, 1952.
Large Rooms : see Rooms.
 Equivalent Lengths and Corrections of Length in Acoustic Systems.—van den Dingen, 1544.
 Audio-Frequency Level Indicators.—Builder & Bailey, 1966.
 Amplitude Limiters and Auto-Regulating Systems in Communication Technique.—Nuovo, 2823.
Limiters : see also Amplifier, Amplitude, Compression.
 Line Equalisation by Predistortion.—Creamer, 1516.
 Papers on H.F. Telephony along Three-Phase Power Lines.—Carbenav, 2379.
Linearity : see Receivers.
 Natural Vibration and Damping of Gas Bubbles in Liquids.—Meyer & Tamm, 4017.
 Acoustic Literature in Journals of 1937.—Patermann, 581.
 Origin of Distance Impression in Hearing, and Sound Localisation.—von Békésy : Wallach, 603 & 3217.
 Mechanical-Electrical Negative-Feedback System for Valve Voltmeters with Logarithmic Indication.—Reidel, 2821.
 Logarithmic Voltmeter with Differential Indication.—Nuovo, 2816.

Acoustics and Audio-Frequencies—

- Simple **Logarithmic** Recording Device.—Rogers & Willig, 3210.
Scale of Loudness [Wagner's Proposed "Everyday-Life" Scale].—G.W.O.H., 600.
- Loudspeakers.**—3978 (Exponential Horns); 1499 (Engineer & Architect: Use of "Flat" L.); Bencke, G.W.O.H., 183 & 1017 ("Invisible" Ls.); Borsarelli, 3605 (High-Power Ls.); Furdue, 3604 (Bessel L. Horns); F. & others, 3182 (Non-Linear Distortion introduced by Magnetic System); Hallmann, 1016 (Selecting Ls. for Special Operating Conditions); Kortling, 2389 (High-Note Auxiliary L.); Manfredi: Rago, 3606 (M.C. Coil: Transients in M.C. Ls.); Massa, 1496 (Temperature-Reduction in High-Power Ls.); Olson, 3183 (Multiple Coil, Multiple Cone); Reinhard, 2386 (Inhomogeneity of Magnetic Fields); Rutelli, 3607 (Mechanical Distortions in Resisting Medium); Waite, 2810 (L. System for High-Quality Broadcasting); Weil, Audak, 4486 ("Spatial Expander").
- Loudspeakers:** see also Baffle, Building-In, Cone, Diaphragm, Distribution-System, Electro-Mechanical, Horn, Low-Speaker, Output-Stage, Prague, Transducer, Transformer(s).
- Loudspeakers, Testing of:** see Automatic, Calibrating, Directivity-Curve, Horns, Impedances, Logarithmic, Measurements.
- Low-Frequency Alternator.**—Kurtz & Larsen, 1961.
"Crystal Low-Speaker" for Hospitals, etc.—Grawor Company, 2390.
- Magnetic Screening by Plane Metal Sheets at Audio Frequencies.**—Moeller, 2377.
- Magnetic Recording** [Survey, including Begun's Recording Machine], 198.
- Experimental Consideration upon A.C. Erasing on **Magnetic Recording**, and Proposition of New Recording Method.—Nagai, Sasaki, & Endo, 1506.
- Magnetic Recording:** see also Magnetophone, Steel.
Fundamentals of **Magnetophone System.**—Lubbeck, 1028.
- Magnetophone** [New Model].—Müller-Ernesti, 3983.
- Sounding of Rivers by Supersonic **Magnetostriction Apparatus**, 632.
Improved **Magnetostriction Oscillator.**—Saisbury & Porter, 2936.
Subaqueous **Magnetostrictive Ecometer.**—Rago, 4537.
Radial Vibration of **Magnetostrictive Ring Plate.**—Suita & Aoyagi, 1056.
- Magnetostrictive:** see also Directivity, Ultrasonic.
- Matching:** see Output.
- Sound Measurements in Industry.**—Abbott, 4528.
Apparatus for Acoustic and Audio-Measurements.—Chinn & James, 1554.
- Acoustic Properties of Materials and Their **Measurement.**—Gigli, 4518.
- Absolute **Sound Measurements in Liquids.**—Klein, 1557.
Recent Improvements in the **Measurement of Sound.**—Vecellio & Brusafiero, 3622.
- Electroacoustic **Measurements with Rayleigh Disc.**—Woelke, 189.
- Measurement(s):** see also Absorption, Audiometer, Automatic, Bridge, Decibel-Meter, Frequency, Impedances, Impulse, Intensity, Level, Noise, Phase, Pistonphone, Pitch, Rayleigh-Disc, Resonance, Time-Constants, Transducers, Volume-Unit.
- Efficient Megaphone** [with Rectangular Aperture].—Watson, 3190.
- Metals:** see Friction, Grain-Size.
- Kontak [Microphone] Unit** [for Bridge of Any String Instrument].—Amperite Company, 1524.
- Spherical Velocity **Microphone** [for Submarine Signalling].—Matudaira & Isii, 4501.
- Microphones.**—3976 (Rochelle-Salt Ms. of S.A.F.A.R.); 3975 (Ms. at Alexandra Palace); Baumzweiger, 1945 (Shure Unidirectional M.); Beerwald & Keller, 3187 (Theoretical Treatment of Piezoelectric Diaphragm M.); Crescini, 3601 (High-Fidelity Types); Ebel, 1520 (Controlled Directivity); Lautier, 3188 (AEG Sucking-Coil M.); Marshall, 3974 (Cardioid M.); Mason & Marshall, 1518 (Tubular Directional M.); Massa, 1519 (Effect of Size on Directional Response); Olson, 3600 ("Line" Directive Ms.); Puolini, 3186 (Design & Calibration of Electrostatic Ms.); Peterson & Hussey, 1944 (Equivalent Network of Idealised Resistance M.); Phelps, 1522 (M. Wind Screening). See also Amplifiers, Calibrating, Carbon, Measurement, Noise, Piezoelectric, Speech, Transducer, Transmitter.
- New **Microphotometer** for Evaluation of Acoustic Records.—Narath & Schwarz, 1548.
- The "Multitone."—Barrow, 3215.
- Electrical Music:** Sir James Jeans on Industry with Great Possibilities, 1949.
- Analysis of **Musical Sounds.**—Dammann, 2825.
Sounds—Pleasant and Unpleasant [Complex Nature of Musical Sounds].—Partridge, 1533.
- Novachord, a New **Electric Musical Instrument.**—Hammond, 1950.
- Musical Instruments:** see also Frequency-Characteristic, Microphone, Organ, Piano, Wire, Wood.
- Music Channels, and The Provision of Music Channels on 12-Channel Carrier Cables.**—Taylor: Halsey & Tucker, 1517.
- Music Channels:** see also Line, Non-Linear.
- Lagoon of Nations Sound System [at New York World's Fair], 4512.
Analysis and Measurement of **Noise in Engineering Problems:** with Special Reference to Electrical Machinery.—Ray, 4527.
- Noise.**—Bérard, 4003 (Objective Measurement: Electrical Causes of Machine N.); Buchmann & Keidel, 597 (Damping of N. from Shooting Range); Cary, 594 (N. from Car Cooling-Fan); German Committee, 2406 (Legal Measures for Reduction); Huber, 593 (Physical Problems in N. Measurement, particularly for Automobile N.); Jacoby, 3204 (N. in Elec. Machinery: Witton Building); King, 589 (Reduction of Structure-Borne N.); Lübcke, 595 (War against N. in Elec. Machines & Apparatus); Rocard, 3602 (Thermal-Agitation Background N. of Microphones); Schmidt, 596 (Magnetic N. of D.C. Machines); Schneider, 2408 (Ventilation Channels); Seacord, 3998 (Room N. at Telephone Locations); Silverman, 1967 (N. and N. Measurement: Bibliography). See also Aphonic, Arc, Book-Review, Distribution-Recorder, Filters.
- Noise-Meters:** see also Dynamics, Logarithmic, Transiron.
- Non-Linear Acoustics of Sound Waves of Finite Amplitude.**—Fubini-Ghiron, 3614.
- Non-Linear Distortion of Music Channels, with Particular Reference to Bristol/plymouth System.**—Jones, 3612.
- Non-Linear:** see also Carrier-Frequency, Combination, Loudspeakers.
- Novachord:** see Musical-Instruments.
- Ohm's Acoustical Law.**—Trendelenburg, 2414.
- Distortions accompanying **Reproduction of Optical Records of Sound Waves.**—Koroleva, 3985.
- Orchestral Pitch** [and Precision Measurement during Broadcast Concerts].—van der Pol & Addink, 2828.
- Electric Organs, 2398.**
Tuning of Beating-Reed **Organ Pipes as Relaxation Phenomenon.**—Auger, 575.
- Acoustic Spectra of **Organ Pipes.**—Boner, 573.
Studies of Tone Quality of **Organ-Pipes.**—Mokhtar, 1531.
Transitions of Sound in **Organ.**—Trendelenburg, 574.
Collision Excitation of **Intra-Molecular Oscillations.**—Eucken & Kuchler, 1567.
- Audio-Frequency Oscillators.**—Barron, 1959.
- Simple **Photograph Oscillator** [for reproduction by Broadcast Receiver].—Kiehne, 566.
- The 173 **Oscillator** [1-150 kc/s].—Means, 3216.
- Audio-Frequency Oscillator.**—Muirhead, 204.
- Oscillators:** see also Analyser, Generator, Magnetostriction, Multitone, Transiron.
- Oscilloscope as "Wow" Detector.**—Travis, 1947.
- Output Stage and Loudspeaker.**—Langford Smith, 1497.
Push-Pull **Output Stages in Broadcast and Power Amplifiers.**—Tillmann, 202.
- Output-Stage Distortion.**—van der Ven, 4505.
- Output Transformers** [Matching Formula only Approximate].—Partridge, 1021.
- Sound Pictures in Auditory Perspective.**—Hunt, 1936.
Analyser measuring **Relative Phases of Harmonics of Sound.**—Carrière, 1553.
- Method of Determining Sense of Small Phase Differences.**—Sattler: Opitz, 3610.
- Method of Measurement of Elastic Constants and Phase Velocities of Transverse and Longitudinal Waves.**—Khol, 1939.
- Practical Design for Electronic Piano, 3988.**
Effect of Finite Breadth of Hammer striking a **Pianoforte String.**—Basu, 2399.
- New Method for **Tuning Pianos.**—de Bremaeker: White, 1529.
Papers on **Pianoforte String and Hammer.**—Ghosh, 572, 1527 & 3989.
- Electone, an Electronic Piano.**—Taylor: Bretzfelder, 1530.
- Piano:** see also Hammer, Musical-Instruments, Wire.
- Pick-Up Design** [around New Type of Needle], 188.
- Pick-Up Devices, and Piezoelectric Pick-Ups.**—Pinciroli: Boselli, 4490.
- Pick-Ups:** see also Electro-Mechanical, Gramophone, Reproducer.
- Piezoelectric Crystal Elements** for Electroacoustical Purposes.—Beerwald & Keller, 564.
- Piezoelectricity in Electroacoustics.**—Crescini, 2813.
Piezoelectricity of Potassium Phosphate.—Ludy, 4488.
- Piezoelectric:** see also Pick-Up, Rochelle-Salt.
Determination of **Adiabatic Piezo-Coefficient of Liquids.**—Raman & Venkataraman, 2422.
Effects of **Cylindrical Pillars in a Reverberation Chamber.**—Sabi 587.
- Piston:** see Diaphragm.
- Moving-Coil Pistonphone** for Measurement of Sound-Field Press.—Glover & Baumzweiger, 1658.
- International Standard of Musical Pitch.**—Kaye, 212.
New Apparatus for **Direct Reading of Pitch and Intensity:** Sound, and Application.—Obata & Kobayashi, 1551 & 4522.
- Pitch:** see also Écart-diaphonique, Orchestral, Standard, Stroboscope, Tone-Pitch.
- Symmetrical Figures on Circular Plates and Membranes.**—Colwell, Stewart, & Friend, 1020.
- Clamped Circular Plate.**—Havasaka, 4502.
- Asymptotic Properties of Characteristic Functions of Vibrating Plates.**—Pleijel, 3184.

Acoustics and Audio-Frequencies—

- Fundamental Vibration of Rectangular Plate.—Waller, 1503.
Plates: see also Chladni, Transmission.
Polyrheter [Potating-Drum Sound-on-Film System].—Stanton, 4499.
 Microphonic Potentials from Utricle.—Pumphrey, 3219.
 Acoustical Properties of Stadion in Prague [using Buried Loud-speakers].—Slavik, 1018.
The Production Panel.—Stentford, 2381.
 Western Electric **Programme Amplifier**, 1954.
Sound Propagation in Atmosphere.—Waetzmänn, Scholz, & Krüger, 3221.
Propagation: see also Elasticity, Explosion, Public-Address, Rayleigh-Waves, Tubes.
 New Applications for High-Power **Public Address Systems**, 1511.
 Sound Amplification and **Public Address**.—de Boer, 1569.
 Electroacoustical Diffusion of Sounds, and Propagation Phenomena in **Public Address Installations**.—Fioravanti: Maione, 4509.
 Problems of Works **Public Address Equipment** in Modern Enterprise.—Kirstaedter, 2393.
 Rating of **Public Address Equipment**.—Robinson, 2394.
Public Address: see also Conference, Electroacoustic, Eucharistic, Intercommunicator, Loudspeakers, New-York, Polyrheter, Prague, Saarbrücken.
Acoustic Radiation Pressure.—Mendousse, 4005.
Radiation Pressure: see also Rayleigh-Disc.
Radio Acoustic Ranging Circuits, and The Sono Radio Buoy.—Dorsey; Senior, 1059.
 Investigation of Accuracy of König's Formula for **Rayleigh Disc**.—Merrington & Oatley, 3214 & 4006.
Rayleigh Disc: see also Calibration, Measurements, Radiation-Pressure, Resonance-Disc.
 Direct Observation of **Rayleigh Waves** in Case of Total Reflection.—Kretschmer & Rsebevkinn, 1574.
 Sound Source with Resonant Chamber, and Acoustical Correction of **Radio Receivers, and Acoustical Measurements of Linearity in Radio Receivers**.—Faggiani; Santoro, 3611.
 Theorem of **Reciprocity and Schottky's Law** as Applied to Non-Stationary Processes.—Kharkevitch, 2395.
 Wireless **Record Player for Radios**.—General Electric, 3191.
Recorder Characteristics.—Apstein, 4492.
 Various Techniques for **Recording of Sound, and Applications in Broadcasting**.—Adam, 4495.
 Fundamentals in the Testing of **Sound-Recording Equipments of All Types**.—German Committee, 2396.
 Electrical Networks for **Sound Recording**.—Hopper, 1507.
 Methods for Testing Glow-Discharge Tubes used in **Sound Recording**.—Illarionova, 568.
Recording: see also B.B.C., Disc, Gramophone, Logarithmic, Magnetic, Magnetophone, Microphotometer, Pitch, Reproduction, Sound-Recording, Steel, Tape, Tone-Pitch.
 A New "VI" and **Reference Level**, 1957.
Reference-Level: see also Level.
 Method for measuring **Sound Relaxation Coefficients**.—Kelberg, 1968.
Relaxation Methods applied to Engineering Problems: Elastic Stability and Vibrations.—Bradfield, Christopherson, & Southwell, 1940.
Acoustic Relaxation Phenomena.—Kneser, 1568.
 D'Arsonval **Reproducer for Lateral Recordings**.—Downs & Miller, 565.
 New System of **Sound Recording and Reproduction** ["I.M.R.C.-Duotrac"], and **Sound Reproduction on Paper**.—Internat. Marine Radio Company; Skvortsov, 2817.
Resonance in External Auditory Meatus.—Fleming; Littler, 1538 & 2830.
 Some Properties of **Resonance Disc and Application**.—Kobayashi & Hayashi, 1962 & 1963.
Resonance: see also Absorbing, Cones, Tubes, Rayleigh, Water. Measurements on **Acoustic Resonators**.—Gemperlein, 1504.
 Type of **Electrical Resonator** ["Hohlraum"].—Hansen, 191.
 Influence of **Resonator upon Field of Sound**.—Sato & Kubo, 586.
 Absorption of Sound with Help of **Damped Resonators**.—Willms, 2411.
 Braun Tube Method of **Reverberation Measurement**.—Morita, 4519.
 Methods of Rhythmic Interruptions for **Reverberation Measurements**.—Sellerio & Del Bosco, 4520.
Reverberation.—Bargone, 3619 (Physical Interpretation of Damping Factor in R. Formula); Chavasse, 584 (Measurement of R. Time); Gigli, 3207 (R. Characteristic of Large Rooms & Properties of Absorbing Materials); Goldmark & Hendricks, 3211 (Synthetic R.); Hall, 3208 (R. Time Meter); Morrical, 3203 (R. Time Scale for High-Speed Level Recorders); Sreenivasan, 1043 (R. Theory & Formulae).
Reverberation: see also Echoes, Impulse-Measuring, Logarithmic, Pillars, Scanning.
 Determination of **Rigidity Modulus of Nickel and Alloys in Annealed and Unannealed States**.—Landon & Davies, 615.
Rochelle Salt.—Ernsthausen, 186 (Piezo-electric Behaviour of Crystals); Hinz, 1943 (Elastic Deformations); Mason; Bantle & Scherrer, 2814 & 3977; Seidl, 187 (Anomalous Charging Current); Wilson, 1019 (Heat Capacity). See also Microphones, Piezo-electric.
 Transmission of **Sound between Neighbouring Rooms in Brick Building**.—Constable, 1042.
 Acoustical Study of **Large Rooms** by means of Models.—Gigli, 3997.
 Investigation of **Room Acoustics by Steady-State Transmission Measurements**.—Hunt, 1540.
 "Die Gestaltung von Räumen [Rooms] nach akustischen Gesichtspunkten."—Makowski, 206.
 Recent Results in **Room and Architectural Acoustics**.—Schuster, 585.
 Neutral Tones of **Rooms with Uneven Walls, and Diffuse Reflection of Sound**.—Skudrzyk, 3620.
Rooms: see also Absorption, Aaphonic, Eigentones, Reverberation, Studios.
 Electroacoustic Installation of Saarpfalz Theatre, **Saarbrücken**, 4511.
 Indicating Arrangement for Short-Time Measuring Apparatus, based on Exploring-Ray **Scanning**.—Winckel, 4011.
Schottky's Law: see Reciprocity.
Screening: see Magnetic.
 Excitation and Stabilisation of **Singing of Flames**.—Carrière, 1545.
 Harmonic Structure of **Vowels in Singing in Relation to Pitch and Intensity**.—Stout, 1536.
 Investigations on **Transition Points between Registers in Singing**.—Trendelenburg, 3986.
 Audibility of **Sirens in Presence of Street Noises**.—Baron, 3196.
 Contribution to Investigation of **Mode of Action of Sirens**.—Schiesser, 1048.
 Sound Absorption of **Snow**.—Kaye & Evans; Seligman, 1543 & 4002.
Sound-Effects Console.—Strathy, 4500.
Sound Effects: see also Sound-Illusion.
 Analysis and Measurement of Distortion in Variable-Density **Sound-on-Film Recording, and Sound Picture Recording and Reproducing Characteristics**.—Frayne & Scoville; Loye & Morgan, 4497.
 "Squeeze" or "Matted" Track [in **Sound Films**].—Hilliard, 199.
Sound-on-Film: see also Diffraction, Optical, Polyrheter.
Sound Illusion Pre-Amplifier.—Sheaffer, 197.
Sound Ranging: see Ranging, Transducers.
 BBC **Sound-Recording Service**.—Barrett, 3192. Also 1948.
Sound Recording in Studios and Theatres, and Technique for Faithful Recording and Reproducing of Sound Pictures.—Tutino; Massarelli, 4496.
Sound Recording: see also Magnetic, Magnetophone, Sound-Film, A Synthetic **Speaker**.—Dudlev, Riesz, & Watkins, 3599.
 Automatic Synthesis of **Speech**.—Dudley, 3987.
 Exploration of Pressure Field around Human Head during **Speech**.—Dunn & Farnsworth, 1523.
 Reversed **Speech** [throws Light on Habits of Speaking].—Kellogg, 3193.
 Measurement of Penetration Capacity between Screened **Speech Circuits**.—Kühnemann, 1035.
 Audibility of Variations in Frequency Band in **Speech Transmission**.—Schäfer, 211.
 Distribution of **Speech Voltages in Simultaneous Transmission by Carrier Currents**.—Thierbach & Jacoby, 3200.
Speech: see also Talks, Voice.
 International **Standard of Concert Pitch**.—Kaye, Madella, & others, 2401, 3197/8.
 Recording on **Steel Tape**, 3984.
Steel-Wire Recording of Sound as a General Commercial Possibility: the "Textophone".—Shipton & Company, 1029.
Stereophonic: see Perspective.
 Theory of **Chromatic Stroboscope**.—Young & Loomis, 1552.
 Acoustic Auscultation of **Structures in Concrete or Metal**.—Coyne, 598.
 New Philips **Studio Equipment** [Hilversum], 1513.
 Broadcast **Studio Audio-Frequency Systems Design**.—Chinn, 1969.
 CBS **Hollywood Studios**.—Chinn & Bradley, 3616.
 Acoustical Design of **Broadcasting Studios**.—McLaren, 208, 1045, 1970 & 3996.
 NBC, **Hollywood [Studio Plant]**.—Rackey & Shuetz, 3617.
 First Athenian **Studio of New Greek Broadcasting Service**.—Schadwinkel, 4517.
 Considerations underlying Design of **Studios for Broadcasting**.—Sreenivasan, 1044.
Studios: see also Arc, Belgium, Rooms, Sound-Recording.
Subaqueous Acoustic Signalling.—Rosani, 4539.
 Dependence of Loudness of **Subjective Difference Tone on Frequency of Primary Tone**.—Kuhl, 2415.
Submarine Signalling, etc: see Audiogeometry, Microphone, Subaqueous, Supersonic, Ultrasonic, Water.
 Water Purification [and Softening] by **Supersonic Waves**.—Beuthe & others, 4541.
 Audible-Frequency and **Supersonic-Frequency Investigations of Concrete Beams with Flaws**.—Meyer & Bock, 4540.
 Theories of **Diffraction of Light at Supersonic Waves**.—Nagendra Nath, 4543.

Acoustics and Audio-Frequencies—

- Precision Measurements of **Supersonic-Wave Velocity** in Various Liquids, and Significance for Sound Dispersion and Supersonic-Velocity Measurement.—Schreuer, 4542.
- Supersonics.**—Applications in Metallurgy, 1975; von Ardenne, 623 (Dust Figures of Standing Waves in Liquids); Bär, 1564 (Dispersion in Liquids); Baumgardt, 633 & 2841 (Critical Analysis of Papers: Measurement of Elastic Constants); Bazulin, 614 (Absorption in Electrolytes); Buss, 1051 (Absorption in Aqueous Solutions); Cance, 624 (Interference, and New Method for Measurement of Velocity); Cerovska, 1562 (Optical Phenomena of S. Grating); Corbino Nat. Institute, 4013; Dadaian & Pumper; Korolev, 2838 (Absorption Measurement in Air, etc.); Fehr, 2421 (in Service of Medicine); Giacomin, 626 (Experiments on Optics of S. Waves); Groenewold, 1974 (Thermal Conditions); Jatkar, 1054 (S. Satellites); Kruse, 4014 (Testing of Work Pieces); Lucas, 1536 (Double Refraction: Waves of Thermal Agitation); Mabler, 2837 (Fresnel Diffraction Phenomenon and Its Evaluation); Marinisco, 629 (Physico-Chemical Properties); Matossi, 2839 (Dispersion in Liquids); May, 621 (Propagation in Capillary Tubes); Metschl, 1539 (Nature & Employment); Paouinoff, 4016 (Luminescence of Water); Pielemeier & others, 4015 (Effect of Water Vapour, Temperature, etc.); Pohlman, 2420 (Absorption in Human Tissue); Riabouchinsky, 215 (S. Analogy of Electromagnetic Field); Richards, 2334 (Summarising Account); Richardson, 2842 (S. Dispersion & Infra-Red Radiation); Sokolov, 625 & 1055 (Application of Short-Focus Optics: Effect of S. on Supercooled Water); Söllner, 631 (Disruption of Solid Substances); Zachoval, 1565 (Dispersion in Castor Oil).
- Supersonics:** see also Absorption, Air-Jet, Altimeter, Audiogoniometry, Chladni, Echo, Elastic, Magnetostriction, Oscillations, Piezo-Optic, Scanning, Testing, Transistron, Ultrasonics, Vibrometer, Viscous.
- Talking Books** [for the Blind], 4493.
- Pedro the Voder: a Machine that Talks, 1495.
- Tape Recorder.**—Dustin, 4494.
- Theory of Telephone Receiver.—Ferrari Tonio'o, 3580.
- Improved Quality Commercial Telephone Receiver.—Roberton, 578.
- Telephony** in the United States, 3224.
- Maroni-E.M.I. Audio-Frequency Equipment at London Television Station.—Turnbull & Clark, 4514.
- Periodic Variation of Temperature caused by Sound Wave.—Hayashi, 4532.
- Template** for Graphing Audio-Amplifier Performance.—Augustadt, 1550.
- Non-Destructive Testing, 1049.**
- Recent Advances in Use of Acoustic Instruments for Routine Production Testing.—Foulds, 1561.
- Testing:** see also Transmission.
- Thermal Agitation:** see Supersonic.
- Thermal Dilatation of Liquids.**—Lucas, 622.
- New Method for Determining Uniaural Differential Threshold.—Hughes, 601.
- Monaural Threshold:** Effect of Subliminal and Audible Contralateral and Ipsilateral Stimuli.—Hughes, 2416.
- Measurement of Time Constants of Electrical Measuring Instruments.—Goffin & Marchal, 265.
- Tone-Fluctuation Meter.**—Weber, 2397.
- AEG Tone-Pitch Recorder, on Grutzmacher-Lotternoser Principle.—Sohn, 3201.
- Microphone Loudspeaker Transducer in Radio Broadcasting.—Marietti, 3603.
- Method of Measuring Transductors [in Sound-Ranging Equipment].—Federici, 4525.
- Simplified Calculations on Multi-Winding Transformers.—Browning, 4504.
- Diverse Transformer Loading [operating Several Loudspeakers].—Partridge, 1498.
- Distortion in Transformer Cores.—Partridge, 3195.
- Frequency Range of Output Transformer, and Application Possibilities of Universal Output Transformer.—Pitsch; Pitsch, Wünsch, 3624.
- Transformers:** see also Output.
- "Transistron" Oscillator.—Brunetti, 24C5.
- Transmission Testing Apparatus** for 30-10 000 c/s Communication Systems.—Herrick & Melling, 1958.
- Transmission of Sound** through Plates at Oblique Incidence.—Sanders, 3991.
- Telephone **Transmission Testing** by Subjective Methods.—West, 1580.
- Transmission:** see also Articulation, Rooms.
- Telephone **Transmitter:** Suggested Theory of Operation.—McMillan, 1031.
- "Transverse" Acoustic Waves in Rigid Tubes.—Hartig & Swanson, 620.
- Transverse:** see also Thermal-Dilatation.
- Damping of Sound in Tubes with Absorbing Walls.—Belov, 591.
- Sound Propagation in Tubes.—Bürk & Lichte, 3185.
- Resonance in Certain Non-Uniform Tubes.—Jones, 1532.
- Sound Transmission Losses in Tubes and Hoses.—Waetzmann Wenke, 2409.
- Tubes:** see also Transverse-Waves.
- Adjustable **Tuning-Fork Frequency Standard.**—Schuck, 1559.
- Apparatus for Comparison of Frequencies of Two **Tuning Forks.**—Bolte, 1965.
- Ultrasonics.**—Alleman, 1563 (Dissipative Reflection Coefficients in Gases); A. & Hubbard, 610 (Reflection Losses in Air, etc.); Baumgardt, 1570 (Present Position of Research); Fox & Rock, 214 & 627 (Source of Improved Design; Optical Studies of U. Waves in Liquids; U. Radiation Field of Quartz Disc); Halpern, 3223 (Anomalous Damping); Hermans, 628 (Charged Colloid Particles); Ludloff, 2840 (U. Method for Elastic Properties of Solids); Porter & Young, 630 (Molecular Rearrangement); Sokolov, 625 & 1055 (Effect on Supercooled Water). See also Book-Review, Supersonic, Ultra-Sound.
- Ultra-Sound Generators, and Transmission and Reception of Ultrasonic Waves** by Nickel-Alloy Laminated Cores.—Giaccia; Federici, 4538.
- The "Striae Method" applied to Study of **Ultrasonic Fields** in Liquids, and Physiological Effects of **Ultra-Sounds.**—Mendel; Ponzio, 4535.
- Utilisation of **Ultra-Sounds** [in Metallurgy, Chemistry, Marine Services, etc.].—Oggioni, 4536.
- Architectural Acoustics at Vatican City.**—De Micheli, 4516.
- Velocity of Sound.**—Allan, 617 (in Copper: Effect of Hardening, etc.); Bergmann & Oertel, 1050 ("Schlieren" Method of Measurement); Colwell & others, 1973 (Oscillographic Measurement); Findlay & others, 4019 (in Liquid Helium under Pressure); Groenewold, 611 (in Liquid Helium); Hirschlaff, 612 (in Liquid Nitrogen); Kneser, 2833 (Discrepancies in Precision Measurements caused by Curvature along Rough Surface); Pielemeier, 3222 (in Air: Survey & Conclusions); Salceanu, 1052 & 1572 (by Resonance Method: V. in Mercury, in Binary Mixtures); Schulze, 1053 (and Dispersion in Chlorine).
- Velocities:** see also Phase.
- Transverse Vibration of Bar.**—Hayasaka, 4503.
- Damping of Lateral **Vibration** of Mild Steel Bar.—Ockleston, 618.
- Vibrations:** see also Cylinder, Flexural, Liquids, Plate, Relaxation, Rigidity-Modulus, Wire.
- Diaphragm of **Vibrometer** for Submarine Acoustical Measurement.—Hayasaka, 2418.
- Symmetrical Vibrating Shell [for Submarine **Vibrometers**, etc.].—Hayasaka, 4534.
- Acoustic Properties of **Viols** of Outstanding Tone Quality.—Meinel, 213, 1525 & 2400.
- Old **Viols** ["Speak" more easily: Search for Physical Reason].—Saunders, 571 & 3990.
- Experimental **Electronic Violin.**—Stautter, 2824.
- Debye Heat Waves in Highly Viscous Liquids.—Raman & Venkateswaran, 613.
- Influence of Acoustic Stimuli upon Limits of **Visual Fields** for Different Colours.—Yakovlev, 599.
- Analysis of Perceptible Overtones in **Voice.**—Lewis & Lichte, 605.
- Volcas:** see Conference.
- Voltmeters:** see Logarithmic.
- Voice-Frequency Volume Control.**—Jefferson & Colchester, 1024.
- Corrections to "Volume Indicator-Attenuator."—Carter, 200.
- Volume Indicator:** see also Level, Reference-Level.
- VU-DB Relationships [Relation between New "Volume Unit" and Decibel Scales].—Hales; Afel, 4529.
- Effect of Consonant on **Vowel.**—Black, 1535.
- Vowel Vibration and Vowel Production.**—Scripture; Paget, 606.
- Vowels:** see also Singing.
- Sound Insulation of **Walls and Floors.**—Nat. Bureau of Standards, 3993.
- Measurement of Sound Intensity under **Water** by Resonance Disc.—Hayashi, 4533.
- Wide Band:** see Amplification.
- Departure of Overtones of Vibrating **Wire** from True Harmonic Series.—Shankland & Colman, 1526.
- Internal Friction of **Wood.**—Krüger & Rohloff, 570.

PHOTOTELEGRAPHY AND TELEVISION

- Actinoelectric Effects** in Tartaric Acid Crystals.—Brady & Moore, 2008.
- New **Television Aerial** ["Tilted-Wire"], 4605.
- Television Receiving Aerials.**—Roosenstein, 4603/4.
- Aerials:** see also Antenna, France.
- Aerial-Coupling;** see Asymmetric-Side-band.
- Alterations at **Alexandra Palace.**—Macnamara, 1079.
- Optical Properties of **Alkali Metals.**—Briggs, 4057.
- Correlation of Optical Properties and Photoelectric Emission in Thin Films of **Alkali Metals.**—Ives & Briggs, 221.
- Photoelectric Properties of **Alkali Films** of Atomic Thickness on Carrier Metals of High Work Function.—Mayer, 658.
- Alkali Halides.**—Gyalai, 4058 (Conductivity of A.H. Crystals with Added Colouring Matter); Rauch, 2001 (U-V Dispersion Frequencies); Seger & Teller, 229 (breakdown); Wolf, 228

Phototelegraphy and Television—

- (Nature of Excitation Centres). See also Crystals, Photoelectric-Effect.
- Television Transmitters [American], 3662.
- Enter American Television [NBC and CBS Final Preparations], 2845.
- Television in the Field [American], 3663.
- Wave Radiation occurring in Transformation of Amorphous Metal Modification.—Kramer, 2013.
- Amplification of Wide-Band Modulated Waves: the HEFOD.—Havasi, 2424.
- Amplifiers.—Barco, 3245 (Measurement of Phase Shift) & 4028 (Iconoscope Pre-A.); Bedford & Fredendall, 3243 (Transient Response); Coking, 234 (High-Gain Television As.); Epstein & Donley, 4029 (Analysis of Video As.); Everest, 2018 (High-Gain, Wide-Band A.) & 2959 (Practical Aspects of A. Design); Gimzton, 1080 (Balanced-Feedback As.); Jofeh, 4581 (Operational Treatment of Time-Base As.); Kautzmann, 2022 (New Valves for Television As.); Lurje, 2019 & 3242 (Non-Stationary Phenomena & Distortions); Mandel, 1088 (Response to Transients, etc.); Pfeiffer, 1592 (with Negative Feedback); Preisman, 3246 (Video A. for C-R Oscilloscope); Schienemann, 2016 (Carrier-Frequency Wide-Band A.); Seeley & Kinball, 2017 & 3244 (Analysis & Design of Video As.); Swift, 2023 & 4583 (A. Testing by Square Waves); Wheeler, 3641 (Wide-Band As. for Television); Williams & Chester, 2860 & 4582 (Input Impedance of Self-Biased As.). See also Cathode-Coupled, Secondary.
- Amplitude: see Limiter.
- Analogies: see Photography.
- Narrow-Band Transmission System for Animated Line Images.—Skellett, 2423.
- Television Station has Radically Designed Antenna ["Cubic-Shaped"].—General Electric, 2429.
- Aerial Coupling Systems for Television, and Note on Asymmetric Sideband Phase Distortion.—Benham, 642.
- Peak Field Strengths of Atmospherics due to Local Thunderstorms at 150 Mc/s.—Schafer & Goodall, 2843.
- Marconi-E.M.I. Audio-Frequency Equipment at London Television Station.—Turabull & Clark, 4551.
- Contact Difference of Potential between Barium and Magnesium.—Anderson: Cashman, 664 & 1091.
- Surface and Volume Photoelectric Emission from Barium.—Cashman & Bassoe, 1612.
- Relationship between Temperature and Barrier-Layer Photoeffect in Copper-Oxide Photoelects actuated by X-Rays.—Kronhaus, 2870.
- Action of Soft X-Rays upon Selenium Barrier-Layer Cells.—Sandström, 223.
- Barrier-Layer-Type Photoelects [Selenium].—Wender, 2011.
- Barrier-Layer: see also Copper, Crystal, Rectifier, Selenium, Thallium.
- Television applied to Blind Landing by R.C.A., 3672.
- Book Reviews: see Electron-Optics, Facsimile, Gaseous, German, Light, Phototélégraphie, Television.
- Cables.—Television Pick-Up over Telephone Cable Pairs, 4038; Agricola, 4546 (Survey of Transmission of Wide Bands over C.); Decker, 4039 (Wide-Band Cs.); Desjovaux & Tardy, 3240 (Laying of Paris Vierzon C.); Köpping, 2425 (Wide Bands over Lines & Cs.); Maitland, 1587 (H.F. Cables: Construction & Use of Low-Loss Conductors); Padel, 2882 (Television by Telephone C.); Shinohara & others, 1588 (Measurements on Concentric Cs. at Hi-yoshi); Wuckel, 2428 (Characteristics of Cs. for H.F. Currents). See also Coaxial, Concentric, Feeders, Interference, Lines, Multi-Channel.
- Photoelectric Properties of Caesium Cathodes when Simultaneously Excited by Light and Electron Bombardment.—Shmakoff, 1610.
- Caesium: see also Secondary-Emission.
- Cathode-Coupled Circuits.—Cocking, 649.
- Cathode-Ray.—Bähring, 3628 (Deflection by Magnetic Fields produced by Coils); Bigalke, Schwartz, 226 (Post-Acceleration); DuMont, 2856 (Intensifier-Type Tube); Iams, 1996 (Electron Gun); I.R.E., 2855 (Progress in 1938); Knoll, 4570 (Telefunken Technique); Knoll & Theile, 4023 (Capacity-Modulated Scanning Tube); McGee & Lubszynski, 638 & 2430 (E.M.I. Transmission Tube); Paehr, 3629 (Production of X-Rays by C-R Tubes); Puckie, 1998 (History); Reusse, 3628 (Charge Distribution); Rogowski & Thiel, 4020 (Post-Acceleration); Schwarz, 1580 (Directive Action & Control Slope); Schwartz, 1997 (Development) & 3627 (Post-Acceleration); Sherman, 652 (Receivers with Standard C-R Tubes) & 1578 (Electro-magnetic Deflection); Wilder, 1581 (Short Videotron Tube).
- Cathode-Ray: see also Control, Deflecting (-ion), Fluorescent, Kinescopes, Phosphors, Storage, Stray-Electron, Telefunken, Willemite.
- Channel Width: see Animated, Resolving-Power, Single-Comparison of Television with Cinema: Relative Definition.—Grisley, 4550.
- Coaxial Cables, Lines.—Aguillon, 1083 & 3241 (Reflection Waves); Brillouin, 231 (Irregularities in Telephone & Television C.Cs.); Josephs, 3638 (Resistance Noise in Coaxial Pair); van Mierlo, 4545 (Telephony & Television by C.Cs.); Saphores & Gloess, 232 (Effects of Irregularities); Weutz, 4041 (Transmission Speed). See also Cables.
- Colloids: see Electro-Optical.
- New Large-Surface Light Relay for Intensity, Colour, or Plane-of-Polarisation Control.—von Ardenne, 4031.
- Coloured Light Relay.—Otterben, 4030.
- Image Scanning in Colour-Television Transmission.—Pressler, 1585.
- System of Transmission of Photographic Images in Colours.—Tricca, 3674.
- Colour Centres: see Alkali-Halides, Crystals.
- Community Reception in Television.—Roosenstein, 4594.
- Television Components [American], 3664.
- Surface and Depth Effects in Composite Photocathodes.—Fleischer & Pech, 2865.
- New Composite Photocathodes [especially Antimony-Caesium Cathode].—Khelebnikov & Zaytsev, 3250.
- Origin of Multiple Spectral Maxima observed with Composite Photocathodes.—Suhmann & Mittmann, 220.
- Photoelectric Excitation of Composite Photocathodes at Low Temperatures.—Suhmann & Mittmann, 659.
- Action of Composite Photocathodes.—Teichmann, 1609.
- Concentric Pairs for High Frequencies.—Paré, 4040.
- Contrast: see Distortion, Gamma, Kinescopes, Photography.
- Control of Electron Beams, with Particular Reference to Television.—Mynall, 647.
- Simplifying Television Controls.—"Cathode-Ray," 4595.
- Note on Copper/Cuprous-Oxide Photoelects.—Mott, 3252.
- Initial Drift in Photoelects [Copper-Oxide Photox Cells].—Wilson, 1614.
- Passage and Diffusion of Corpuscles across Barriers of Coulombian Potential.—Badarau, 663.
- Photoconductivity of Crocoite Crystals.—Brady & Moore, 2869.
- Mean Free Path of Electrons in Polar Crystals.—Fröhlich & Mott, 3253 & 4056.
- Electron Conduction in Crystals.—Hilseh, 4585.
- Control of Electron Currents with Thermoelectric Crystal, and Model of Barrier Layer.—Hilseh & Pohl, 1615.
- Electronic Conduction in Insulating Crystals under Very High Field Strength.—von Hippel, 656 & 1067.
- Magnetic Susceptibilities of Potassium Bromide Crystals with Colour Centres.—Jensen, 1583.
- Absorption of Light by Crystals.—Mott, 230.
- Colour Centres in KCl Crystals with Small Additions of Alkaline-Earth Chlorides.—Pick, 3254.
- Thermal Diffusion of Colour Centres in KCl-Crystals, also Nature of U-Centres in Alkali Halide Crystals, and Yield of Quanta in Formation of Colour Centres in NaCl- and KCl-Crystals.—Stasiw: Hilseh & Pohl; Schaitberger, 227.
- Formation of Colour Centres in KI-Crystals.—Vossnack, 3632.
- Crystals: see also Actinoelectric, Photoelectric Currents.
- Definition: see Cinema.
- Television Deflection Circuits.—Engstrom & Holmes, 1579.
- Deflecting Arrangements for Television.—Faust, 648.
- Deflection Errors of Electric and Magnetic Deflecting Systems.—Glaser, 1577.
- Generation of Saw-Tooth Currents for Magnetic Deflection in Television Tubes.—Günther, 2431.
- Electromagnetic Deflecting Systems in Television Apparatus.—Mishin, 225.
- Line Deflectors: General Principles of Magnetic Type.—Ridgeway, 3226.
- Image Defects of Magnetic Deflecting Fields.—Wendt, 3225.
- Deflection: see also Control, Time-Base.
- Non-Linear Distortion in Television [and "Contrastor" Circuits].—Stromberg, 3223.
- Interpretation of Amplitude and Phase Distortion in Terms of "Paired Echoes."—Wheeler, 3642.
- Distortion: see also Amplifiers, Asymmetric-Sideband, Modulation, Resolving-Power.
- Improved Methods of Illumination for Measurement of Accidental Double Refraction.—Björnstahl, 3257.
- Temperature Variation of Electric and Magnetic Double Refraction of Liquids.—Grodde, 1092.
- DuMont Television.—Goldsmith, 1984.
- Television Economics.—Goldsmith, 1989, 2844 & 4559.
- Electron Distribution in Electron-Optically Focused Electron Beams.—Jacob, 3625.
- Ionisation and Excitation in Mercury Vapour produced by Electron Bombardment.—Nottingham, 2007.
- Electrons: see also Corpuscles, Crystals, Emission, Penetration, Photoelectric-Effect, Scanners, Secondary-, Stray-, Electron-Microscope: see Scanners, and under "Subsidiary Apparatus & Materials" and "Miscellaneous."
- Terminology of Technique of Secondary-Electron Multipliers.—Herold, 3634.
- Development of Voltage Amplifiers operating on Principle of Electron-Multiplication.—Lepeshinskaya, 1088.
- Electron Multiplier for measuring Ionisation Currents.—Rann, 1069.
- Electron-Multipliers: see also Caesium-Cathodes, Light, Penetration, Photoelectric-Multipliers.
- Electro-Optical Constants of Polar Liquids.—Dallaporta, 3653.

Phototelegraphy and Television—

- Electro-Optical Effects in Colloids, and Influence of Frequency on Electro-Optical Effect in Colloids.**—Mueller: Norton, 2874.
"Electron Optics" [Book Review].—Klemperer, 2857.
Emission: see Electrons, Secondary.
English and Continental Television.—Traub, 3865.
Wireless Exhibition, 1938: Technical Survey, 649.
Television at London and Paris Radio Exhibitions.—von Farnholz, 639.
Television at Broadcasting Exhibition, Berlin, 1938.—Ipfert, 236.
Fernseh A.G. at the 1938 Berlin Radio Exhibition: also "Opta" (Loewe) Television Apparatus: Television Development of Lorenz A.G.; and Some Telefunken Developments, 1074.
Exhibitions: see also English & Continental, German, Large-, Olvupia.
Papers on Properties of the Eye.—Kravkov, Fedorov, 2875.
Facsimile Broadcasting [of Morning Newspaper] in California, 3675.
Narrative Bibliography of Radio Facsimile.—Callahan, 2878.
"Reado" Facsimile Printer.—Crosley Corporation, 2025.
High-Speed Four-Column Facsimile Recorder.—Finch, 4607.
Tests of Facsimile Radio Transmission in Italy.—Magneti Marelli, 2879.
"Radio Facsimile" [Book Review].—Radio Corporation, 2877.
Facsimile Demonstration [Chicago/New York].—Western Union, 2024.
Automatic Facsimile Telegraph.—Western Union, Janson, 3256 & 4606.
Facsimile: see also Distortion, Phototelegraphy, Picture-Selective-Sideband, Television (I.R.E.).
Investigations on Faraday Effect in Transparent Media.—Gabler, 4032.
Long Feeders for transmitting Wide Sidebands, with Reference to Alexandra Palace.—Cork & Pawsey, 641.
Correction to "On Measurement of Optical Constants of Very Thin Metal Films."—Forsterling, 1090.
Relation between Transmission of Light and Conduction of Electricity in Thin Metallic Films.—Saito, 4584.
Photoconductivity of Metal Films.—Wilson, 2010.
Films: see also Alkali, Amorphous-Metal, Penetration, Potassium, Scanners, Secondary-Emission, Silver.
Flask Receiver: see World's-Fair.
Flicker: see Eye.
Production of Microstructural (Fluorescent) Screens.—Golbreich, 2002.
Development of Cathode-Ray Fluorescent Screen.—Schleede & Bartels, 4572.
Fluorescent Materials for Television Tubes [and the Mixing of Colours].—Schmidling, 4573.
Fluorescent: see also Illumination, Lamps, Ultra-Violet, and under "Subsidiary Apparatus & Materials."
General Problem of Television, and Its Actual Position in France, and Installation of Transmitting Aerial of Eiffel Tower.—Mallein: Rabuteau, 3668.
Gamma and Range in Television.—Maloff, 3229.
"Gaseous Electrical Conductors" [Book Review].—Wheatcroft, 2009.
General Electric Television Licence, 1987.
Travelling Television Exhibition of German Post Office in South America, 4553.
Television [German Service].—Gehrts, 1603 & 4556.
Iconoscopes [New Types 1849 and 1850].—RCA, 3247.
Iconoscopes: see also Amplifier, Orthicon, Pick-Up.
Illumination by Luminescence.—Claude, 3258.
Television for India.—Catterson-Smith, 1077.
Insulation in Television.—Naumburg, 4596. See also Safety.
Experimental Investigations on Susceptibility to Interference of Wide-Band Cables with Tubular Outer Conductor.—Muller & Riedel, 2863.
Interference: see also Atmospheric, Noise.
Interlaced Scanning: see Scanning, Synchronisation.
Intermediate-Film Process.—Schubert, Dillenburg, & Zschau, 3667.
Townsend Ionisation Coefficients in Cs/Ag/O Phototubes filled with Argon.—Huxford, 2866.
Digest of Technical Papers at Rochester Fall Meeting, IRE-RMA, 1978.
Development of Television in Japan, 2876.
New Method of Measuring Kerr-Effect Inertia.—Maercks & Hanle, 1605.
Theory of Electric Polarisation, Electro-Optical Kerr Effect, and Electric Saturation in Liquids and Solutions.—Niekara, 4033.
Connection between Degree of Depolarisation of Light scattered at Molecules of a Liquid and Kerr Constant.—Stuart & Buchheim, 233.
Contrast in Kinescopes.—Law, 4571.
Electrostatic-Deflection Kinescope Unit for Television Receiver.—Sherman, 1999.
National Union Television Laboratory, 1990.
High-Efficiency Mercury and Sodium Vapour Lamps, and Basis for High Efficiency in Fluorescent Lamps.—Buttolph: Thayer & Barnes, 2441.
New Ways of Large-Picture Production in Television: Fernseh A.G. at the 1938 Exhibition.—Möller, 1071.
Official Demonstration of Large-Screen Television at Théâtre Marigny.—Adam, 2850.
Development in Large-Screen Television.—Myers, 1983.
"Perception of Light" [Book Review].—Wright, 1034.
Application of Polycascade Secondary-Electron Multipliers to Measurement of Low-Intensity Light.—Dobrolubskij, 2921.
Light Filter for Television Studio Illumination.—Seki & others, 2434.
New Sensitive Light-Counter.—Tzschaschel, 657.
Light: see also Crystals, Double-Refraction, Films, Kerr, Polaroid, Ultra-Violet.
Light Relays: see Colour (ed), Double-Refraction, Electro-Optical, Faraday, Kerr, Supersonic.
Television Lighting.—Eddy, 4561.
Amplitude-Limiter of Anode-Saturation Type.—Osawa, 2433.
Television Transmission over Lines.—Küpfmüller & Mayer, 1978.
Lines: see also Cables, Feeders, Short-Distances, Transmission-Lines, Tubes.
Marconi-E.M.I. Audio-Frequency Equipment at London Television Station.—Turnbull & Clark, 3238.
Luminescence and Photoconductivity of Solids.—Randall & Wilkins, 3830.
Magnesium: see Barium.
Magnetic Field Effect upon Photoelectric Properties of Iron.—Olson, 4587.
Magnetic: see also Deflection (-ors).
Marconi-E.M.I. Television System.—Blumlein & others, 637 & 4045.
A Pictor in Television [Work of Emil Mechau].—Schröter, 239.
Importance of Mechau Picture-Stabilising Film Projector as Television Transmitter.—Schröter, 1985 & 4034.
Miniature Staging: Technical Side of Video Effects.—Eddy, 4560.
"Sense" of Modulation in Television.—Barthélémy, 3232.
Study of Distortions of Modulation due to Transmission Circuits of Modulated High Frequencies.—Cafferata: Varaldi-Balaman, 3231.
Analysis of Load-Impedance Modulation.—Roder: Parker, 3639.
Moscow: see Television, Ultra-Short.
Application of Motion-Picture Film to Television.—Engstrom, Beers, & Bedford, 4035.
Reply to Discussions on "Modern Systems of Multi-Channel Telephony on Cables."—Angwin & Mack, 644.
Noise in Television Receivers: Some Unsuspected Causes of Interference.—West, 3235.
Noise: see also Atmospheric, Interference.
"Synthetic" Method for Study of Non-Sinusoidal Periodic Regimes.—Quilico: Sartori, 4022.
Television Progress: Report of Olympia Convention, 4564.
Optical Properties: see Alkali, Eye, Films, Potassium, Rhodium.
Orthicon ["Gamma Unity" Form of Iconoscope].—Rose & Iams, 3636 & 4567.
Television Output Circuits.—Cocking, 1584.
"Peak" Detectors: Applications to Television.—Barthélémy, 1087.
Penetration of Low-Speed Electrons through Thin Mica Film.—Kato & Takada, 2435.
Photoelectric Effect and Photoconductivity of Phosphorescent Sulphides and Fluorides.—Vovatzakis, 3631.
Characteristics of Phosphors for Cathode-Ray Tubes.—Headrick, 1582.
Photoactivation of Solids and Its Effect on Adsorption.—Hedvall & Cohn, 2439.
Production of Thermally Stable Lustrous Silver Layer for Photocathode.—Golbreich, 2003.
Behaviour of Composite Photocathodes of K, Rb, and Cs in Ultra-Violet Region.—Kluge, 1608.
Photocathodes: see also Composite, Photoelectronic-Photography, Spectral Sensitivity.
Photocells: see Photoelectric-Cells.
Photoconductivity: see Crystals, Films, Luminescence.
Quantum Equivalent in Case of Primary Current of Internal Photoeffect.—Hlúčka, 4060.
Photoelectric Cells.—Déchène, 1613 (New Mercuric-Oxide Type); Krüger & Weidert, 1611 (Vacuum Ps. at High Voltages & Flux); Skellett, 222 (Time Lag).
Photoelectric Cells: see also Barrier-Layer, Ionisation, Photocathode, Photoemissive, Photovoltaic, Photronic, Rectifier, Regenerative, Spectral, Thallium, and below.
Quantitative Treatment of Primary and Secondary Photoelectric Currents.—Hilsch & Pohl: Schottky, 2868.
Radio Progress during 1938: Electronics: **Photoelectric Devices.**—I.R.E., 2873.
Additional Electrons due to Photoelectric Effect in Non-Independent Hydrogen Discharge.—Costa & Raether, 665.
Photoelectric Effect of Deuteron.—Eisenbud, 3648.
Two Remarkable Examples of Non-Additivity of Photoelectric Effects with Simultaneous Luminous Flux.—Liandrat, 1089 & 4063.
Photoelectric Effect and Action of "Normal" Waves: Probability and Entropy.—Loiseau, 4586.

Photography and Television—

- Internal Photoelectric Effect.**—Tartakovsky, 4059.
- Photoelectric Effect:** see also Phosphorescent Sulphides, Secondary-Emission, Semiconductors.
- Noise Reduction** by means of **Photoelectric Multipliers.**—Preisach, 2864.
- Photoelectric Properties:** see Alkali, Barium, Magnetic-Field, Potassium, Titanium-Dioxide, Willemite.
- Experimental Results** obtained by **Photoelectric Photography.**—Lallemand, 2872 & 3844.
- Studies in Photoelectric Photometry:** **Photoemissive Cell** specially designed for High-Precision Measurements.—Boutrv & Gillod, 4061.
- Analogies in Radio and Photography,** and Problems of Reproduction of Television Images.—Dudley, 3230.
- Photography:** see also Photoelectronic.
- Spectral Variation of Photosensitivity** of Visual Purple.—Schneider, Godewy, & Lythgoe, 2440.
- "Principes et Etat actuel de la Phototélégraphie"** [Book Review].—Carneponne, 654.
- Phototelegraphy:** see also Facsimile, Picture.
- Sensitisation of Reversible Photovoltaic Cells.**—Schlivitch, 2438.
- Properties of Type II Photronic Cells** affecting Photometric Measurement.—Stewart & O'Brien, 3652.
- Television Pick-Up Tube** [Use of Double-Sided Mosaic].—Finke, 1994.
- Mode of Action of Image Pick-Up Tubes** and on Increasing Their Sensitivity.—Heimann, 4027.
- Cause of the Disturbing Signal** in Television Pick-Up Tubes.—Heimann & Weinheuer, 1806.
- Image-Converter Storage-Type Pick-Up Tube.**—Knoblauch & Kluge, 4568.
- On Building-Up of Potential and Efficiency** of Semiconductor Pick-Up Tubes.—Krawinkel & Salow, 1065.
- Survey of Television Pick-Up Devices.**—McIlwain, 4026.
- Storage Television Pick-Up Cameras** with Semiconducting Dielectric.—Salow, 1995.
- Pick-Up Tubes:** see also Iconoscopes.
- Television Pick-Up Van** of the R.P.F.—Weiss, von Oettingen, & Turetschek, 4037.
- Picture Transmission** by Siemens-Karolus System.—Jones, 1617.
- Reception of Positive Images in Picture-Telegaphy Transmissions.**—Heintze & Schönfeld, 3255.
- Electrical Transmission of Pictures.**—Kamenarovic, 4054.
- Picture Telegaphy:** see also Animated-Line-Images, Facsimile, Phototelegraphy.
- Scattered Light from Polaroid Plates.**—Farwell, 655.
- Optical Properties of Very Thin Potassium Films.**—Hacman, 3645.
- Potassium:** see also Secondary.
- Optical and Photoelectric Properties of Potassium** at Liquid-Air Temperatures.—Packer, 3646.
- High-Frequency, Frequency-Changing, and Detector Stages of Television Receivers.**—Strutt, 1591, 2020, 2428 & 2861.
- Television Receivers.**—Te Ka-De, Fernseh, & Teletunken, 1075; Marking of Controls (R.M.A.), 1993; On Sale in New York, 3667; Radiolympia, 3680; Barber, 2853 (Safety in); Cocking, 4050 (Magnetic K.); Engstrom, 4044 (General Account); E. & Holmes, 3658 (Power for, and Attenuation of One Sideband); Fink, 235 & 1076 (Laboratory R., and Adjustment to Selective-Sideband Transmissions); Perkins, 1991 (Design Factors); Robinson, 3655 (Optical System of Scophony Ks.); Rudert, 3659 (Design Viewpoints) & 3661 (Fernseh Small R.); Shuard, 651 & 1992 (Construction & Alignment of Practical R.); Valentine, 4051 (Philips Large-Screen R.); Warner, 650 (Safety Precautions).
- Receivers:** see also Kinescope, Large-, Noise, Servicing, Stereoscopic, Storage, Synchronisation, Television, Testing, Unit.
- Accuracy of Rectifier-Photoelectric Cells.**—Atkinson, Campbell, Palmer, & Winch, 1088.
- Rectifier Cells:** see also Selenium.
- A Regenerative Photocell.** 3249.
- New Hard-Valve Relaxation Oscillator.**—Black, 2000 & 4580.
- Resistors at Video Frequencies.**—Barber, 1595.
- Channel Width and Resolving Power** in Television Systems.—Wilson, 1586.
- Note on Special Reflectivity of Rhodium.**—Coblentz & Stair, 2015.
- "Safety"** becomes a Watchword.—De Soto, 2854. See also Insulation, Receivers, Transformer.
- Radial Scanning:** Avoiding the Need for Fly-Back, 3227.
- New Mechanical Scanning System.**—Amrein, 1986.
- Television Film Scanner.**—Goldmark: Columbia Broadcasting, 4548.
- Electron Scanners** for producing Images of Structure of Surfaces and Thin Films.—Knoll & Theile, 4024.
- Some Factors** involved in Optical Design of Modern Television Receiver using Moving Scanners [and Advantages of Walton "Split-Focus" Principle].—Lee, 4593.
- Historical Development of Interlaced Scanning Method.**—Raack, 3233 & 4576.
- Television with Nipkow Disc and Interlaced Scanning.**—Rinia, 1597.
- Resistance-Controlled Image-Scanning Tubes.**—Theile, 217.
- New Mechanical Film Scanner.**—Thöm, 645.
- Universal Mechanical Scanner** for Transmissions of Persons, Films, and Diapositives.—Thöm, 3666.
- Scanning Coil Construction.**—Tvers, 4575.
- Scanning:** see also Intermediate-Film, Scophony, Sound-Films, Stray-Electrons.
- Scophony's Part in Television.** 2849.
- High-Speed Synchronous Motor** employed in British Television [for Scophony Scanning Mechanism].—Jupe, 1598.
- Design and Development of Television Receivers using Scophony Optical Scanning System, and Synchronisation of Scophony Television Receivers.**—Sieger: Wikkenhauser, 4592.
- Scophony:** see also Scanners, Superionic.
- The Lens-Raster Screen.**—Möller, 3654.
- Amplification by Secondary-Electron Emission.**—Rann, 4568.
- Measurements on Secondary Electrons** emitted from "Recoil Nets."—Sandhagen, 218.
- Secondary-Electron Emission.**—Bruining, 662.
- Secondary Electrons:** see also Electron-Multiplier, Regenerative, Secondary-Emission.
- Type EE 50 Secondary-Emission Valve** for Television Wavelengths, 1594.
- Photoeffect and Secondary Emission** with [Caesium-] Alloy Cathodes. Gopstein & Khorosh, 2867.
- Photoeffect and Secondary Emission** from Iodised Potassium.—Hopstein & Puntus, 2005.
- Influence of Gases on Secondary Emission** of Certain Metals.—Khlebnikov, 1070.
- Dependence of Coefficient of Secondary Emission** on Angle of Incidence of Primary Beam.—Lukjanov, 2436.
- Contribution to Technique of Measurement of Secondary Emission** of Electrons.—Majewski, 3248.
- Secondary Electron Emission** from Thin Films.—Pesyatski, 3635.
- Papers on Secondary Emission.**—Pinciroli & others, 2006.
- Measurement of Secondary Emission** in Valves.—Trelor, 660.
- Secondary-Emission** (Coefficients of Caesium-Oxide Surfaces are Independent of Nature of Metal dispersed through Coating.—Trelor, 661.
- Secondary-Emission Valve** in an Amplifier.—Valecka, 4569.
- Secondary Emission:** see also under "Valves & Thermionics."
- Selective Sideband versus Double Sideband** Transmission of Telegraph and Facsimile Signals.—Smith, Trevor, & Carter, 1616.
- Spectral Sensitivity of Selenium Rectifier Photoelectric Cells.**—Barnard, 2437.
- Selenium Photoelement.**—Becker, 4065.
- Wavelength Variation of the Nuclear Photoeffects:** with Appendix—Radioactive Isotopes of Selenium.—Bothe & Gentner, 4064.
- Conversion of Vitreous and Monoclinic (α) Selenium** to Hexagonal Modification.—Das & Gupta, 2012.
- Selenium Photoelement:** Behaviour in H.F. Circuit.—Goos, 4588.
- Spectral Intensity Distributions of Selenium Barrier-Layer Cells.**—Görlich, 3251.
- Direct Measurement of Energy of Photoelectrons** in Barrier Layer of Selenium Cells.—Lindrat: Schweickert, 3651.
- Optical Transparency of Selenium** in Connection with Photoelectric Conduction.—Mösch, 4589.
- Selenium Cells:** see also Barrier-Layer, Copper-Oxide, Photoelectric-Effects.
- Note on External Photoelectric Effect of Semiconductors.**—Condon, 1066.
- Study of Semiconductors** in Variable Régime.—Déchêne, 3649.
- Effect of X-rays on Semiconducting Sb₂S₃, SiC, and PbS Crystals.**—Kronhaus, 3650.
- Theory of Electronic Semiconductors.**—Nijboer, 4055.
- Photoeffect in Semiconductors.**—Trofimov, 2871.
- Semiconductors:** see also Barrier-Layer, Pick-Up, Scanning.
- Servicing** in Relation to Television Receivers.—Carratt, 4052.
- Television Transmissions over Short Distances.**—Lipfert, 643.
- Sideband:** see Asymmetric, Selective, Single.
- Structural Characteristics of Certain Silver Films.**—Essig, 1607.
- Silver:** see also Photocathode.
- Single-Sideband Filter** Theory with Television Applications.—Hollywood, 3643.
- Remarks on Single-Sideband Working** in Television.—Urtel, 4547.
- Sky Wave:** see Ultra-High.
- Sound Motion Picture Films** in Television.—Maurer, 4549.
- Equipment for Radio Transmission of Sound Films.**—Vilenkin, Obukhov, & Polyanski, 237.
- Sound Films:** see also Mechau, Motion-, Scanner, Television.
- Close Relationships** between Sound Reproduction and Television.—"Cathode-Ray," 4563.
- Automatic Spectral-Sensitivity Curve Tracer.**—Perkins, 3647.
- Discussion of Proposed R.M.A. Standards** for U.S.A.—Murray, 1600.
- Steering** by Television, 4053.
- Problem of Stereoscopic Television.**—von Ardenne, 1978.
- Stereoscopic Television:** a Suggestion.—Gartland, 1977.
- Papers on Light Storage** in Television: Its Application to Cathode-Ray Reception.—von Ardenne, 1063, 2432, 2848 & 3633.
- Problem of Electrical Image Storage.**—Krawinkel, Kronjager, & Salow, 4025.

Phototelegraphy and Television—

Problem of Reception "Storage" in Television.—Schröter, 1064.
Storage-Type: see also Pick-Up.
 Importance of "Stray Electron Effect" in Functioning of Television Scanning Tubes.—Knull, 218.
 Theories of Diffraction of Light at Supersonic Waves.—Nagendra Nath, 4590.
Supersonic Light-Relay in Television.—Otterlein, 2014.
Supersonic Light Control and Application to Television, with Special Reference to Scophony Television Receiver.—Robinson, 4591.
 Problem of **Synchronisation** in Cathode-Ray Television.—Bingley, 1084.
Television Synchronisation.—Engstrom & Holmes, 1085.
 Problem of **Synchronisation of Television Receivers**.—Mandel, 3234.
Television: the Synchronising Signals.—Barthélémy, 1596.
Synchronising-Signal Generator.—DuMont, 4577.
 Generation of **Synchronising Signals for Television**.—Osawa, 4578.
Synchronising Impulse Generator for Television Deflecting Circuits.—Zaharis, 4579.
Synchronising: see Limiter, Peak-Detectors, Scophony.
Telefunken Projection Tube, 1038.—Diels, 1072.
Telesurgery, 3673.
 Problem of Television from Standpoint of Motion Picture Industry, 2851.
 International Television Conference in Zürich, 1804.
 Technical Equipment of **Television Studios**, 4552.
Television [Notes on History: System at London Television Station].—Ashbridge, 636.
 Reviews of Progress: Broadcasting and **Television**.—Ashbridge, 1979.
 Montrouge Experimental **Television Centre**.—Barthélémy, 3669.
 B.B.C. Questionnaire on Popularity of **Television Items**, 4048.
 Operating Technique in **Television**.—Birkinshaw, 1082.
 New **Television System**.—Braude, 646.
 Education of **Television Engineer**.—Date, 1602.
 Influence, on Form of **Television Signals**, of Conditions of Employment of Equipment.—Delvaux, 4036.
 Moscow **Television Transmitter**.—Djighit, 238.
 Fundamentals of **Television Engineering**.—Everest, 4558.
Television Formulary.—Fink, 3671.
 "Der Fernsehdienst" [Television Service of German Post Office: Book Review].—Gehrts, 1603.
 Present-Day Problems of **Television Technique**.—Gehrts, 1073 & 1980.
Television Station W2XAX [Columbia System].—Goldmark, 1589 & 1988.
 Problems of **Television Transmission**.—Goldmark, 4043.
 Purdue University Experimental **Television System**.—Harding, George, & Hein, 3670.
 Radio Progress during 1938: **Television and Facsimile**.—I.R.E. Committee, 2847.
 Recent Progress in **Television**.—Kirke, 4555.
 Question of Number of Lines in **Television Transmissions**.—Kirschstein, 224.
 London **Television Service**, and The Marconi-E.M.I. **Television System**.—Macnamara & Birkinshaw: Blumlein & others, 637 & 4045.
 High-Definition **Television**.—Mertz, 4042.
Television—an Old Dream of Mankind.—Rukop, 4565.
 Sarnoff's Statement on **Television**, 1601.
 Probable Influences of **Television** on Society.—Sarnoff, 4047.
 The **Television Image** from Physical, Physiological, & Psychological Viewpoints.—Schröter, 1981.
Television Problems and Their Practical Solution.—Schröter, 1982.
 Production Problems of **Television**.—Woolfe Murray, 4046.
Television: see also Alexandra-Palace, American, Animated, Antenna, Asymmetrical, Blind-Landing, Cable, Cinema, Colour, Community, Components, Controls, Deflecting(ion), Du Mont, Economics, English, Exhibitions, France, Gamma, General-Electric, German, India, I.R.E., Japan, Laboratory, Light-Filter, Lighting, Lines, London, Mechau, Miniature, Modulation, Motion Picture, Output, Peak-Detector, Photography, Pick-Up, Receiver, Resolving, Scophony, Scanning, Screen, Short-Distance, Single-Sideband, Sound, Sound-Films, Standards, Steering, Storage, Synchronisation, Terminology, Test, Telesurgery, Transmission, Transmitter, Two-Way, Ultra-, World's-Fair.
Television Terminology [Equivalents in Italian, French, English, & German], 2852 & 4562.
Terminology: see also Electron-Multipliers, Sound-Reproduction, Television-Formulary.
 Testing and Tuning of **Television Receivers**.—Mishin, 3656.
Television Test Equipment.—RCA, 1599.
 "Testing Television Sets" [Book Review].—Reyner, 653.
 Note on Programme of Quality Tests.—Villeneuve, 1081.
Testing: see also Laboratory.
Tnallium-Sulphide Photocells with "Positive" Photoeffects.—Koliomets, 4062.
Time Base: see Amplifiers, Deflection, Non-Sinusoidal, Relaxation, Photo-Sensitive Titanium Dioxide.—Williamson, 2004.

H.T. **Transformer Construction**: Safeguards against Breakdown.—Partridge, 4597.
Transient: see Amplifiers.
Television Transmission Technique.—Ring, 2427 & 3640.
Radio Transmission Considerations [Differences between Sound and Picture Requirements].—Smith, 2846.
Transmission Lines as Coupling Elements in Television Equipment.—Seeley & Kimball, 3239.
 Eiffel Tower **Television Transmitter**.—Mallein & Rabuteau, 4557.
Television Transmitter, 1 kW Type for General Sale.—RCA, 1590.
Transmitters: see also American, Audio-Frequency, Marconi-E.M.I.
 Question of Use of Waves in Tubes as Transmission Channels.—Schröter, 4544.
 Technique of **Television-Telephony Apparatus** ["Two-Way Television"].—Schröter, 4554.
 Observations on Sky-Wave Transmission on Frequencies above 40 Megacycles, and Study of **Ultra-High-Frequency Wide-Band Propagation Characteristics**.—Goddard: George, 1578.
 Apparatus for Measuring Phase and Group Transit Times at **Ultra-High Frequencies**.—Roosenstein, 1593.
Ultra-Short-Wave Radio Transmitters at the Moscow Television Centre.—Besidki, 635.
Television Radio Link [Difficulties in Operation of **Ultra-Short-Wave Link** for O.B.s].—Macnamara, 3236.
 Aspects of Propagation of **Ultra-Short Waves**.—Smith-Rose, 3637.
Ultra-Short: see also Tubes.
 Simple Xenon Lamp for Short-Wave **Ultra-Violet**.—von Ardenne, 1093.
 Standard **Television** [Example of German "Unit" Receiver], 4588.
 Results of Collaborative Work in **Television** [Development of German "Unit Television Receiver" and Associated Equipment].—Gladenbeck, Weiss, & others, 4599, 4603.
Wide-Band: see Application.
 Photoconductivity of Crystalline **Willemit** at Low Temperatures.—Hofstadter & Hermann, 4574.
 Discussion of RCA **Television Exhibit** at San Francisco **World's Fair**.—Davis, 3237.
Television Demonstration System for New York **World's Fair**.—Castle, 4049.
 Scattering and Photoelectric Absorption of High-Voltage **X-Rays** in Nitrozen.—Trueblood & Loughbridge, 666.
X-Rays: see also Semiconducting.

MEASUREMENTS AND STANDARDS

Absorption and Reflection Measurements in Centimetric-Wave Range.—Kebbel, 2444.
Absorption: see also Energy.
 Measurements of **Admittances** at Ultra-High Frequencies.—Miller & Salzberg, 3265.
 High-Frequency **Ammeter** employs Phototube Indicator.—General Electric, 668.
 Discussion on "Bearing Type High-Frequency Electrodynamic **Ammeter**."—Meahl: Miller, 3683.
Ammeters: see also Current, D.C. Meter.
 Absolute Determination of **Ampere**, using Improved Coils.—Curtis & others, 3281.
 New Limiting **Amplifier** [for Distortion Measurement, etc.].—Davis, 1645.
 "Variable Q" **Amplifier**: Power Amplifier with Inherent Voltage Compensation for Load Variations.—Fairweather & Williams, 1646.
 Differential Pre-**Amplifier** for Electrophysiological Purposes and Bridge Measurements.—König, 1647.
 Logarithmic **Amplifier**.—Pevtsov, 1107.
Amplifier in Electrical Measuring Technique.—Schleicher & Thal, 2452.
Amplifier Testing by Square Waves.—Swift, 2032 & 4636.
Amplification, Amplifiers: see also Phase-Shift, Thermocouple.
 Sound **Analyser** and A.F. Oscillator using Degenerative Amplifier to give Highly Selective Circuit.—General Radio: Scott, 2908.
Analysers: see also Electrostatic.
 Attenuation Measurement by Quotient Method.—Opitz, 2046 & 3271.
Attenuator: see Cables.
 Properties of Thin **Bismuth Films**.—Yamaguchi, 1114.
 "Misure radiotechniche e Formulario" [Book Review].—Pession, 2917.
 Wide-Range **Wheatstone Bridge**.—Avins, 4631.
 "Alternating Current **Bridge Methods**" [Book Review].—Hague, 1121.
Bridge for Separating Components of Travelling Waves.—Hartig & Brunetti, 4068.
 Radio-Frequency **Bridge**.—Muirhead, 4629.
 Improved Low-Voltage A.C. **Bridges** for measuring Properties of Insulating Materials.—Reynolds & Rice, 2036.
 Precision Inductance **Bridge**, and A.C. Measuring **Bridge**.—Sullivan: Mullard, 688.

Measurements and Standards—

- Bridges**: see also Amplifier, Capacitance, Impedances, Inductometer, Null-, Potential-Difference, Vacuum-Tube.
- Bridge-Stabilised Oscillator**.—Meacham, 263.
- Measurement of Broadcast Coverage and Antenna Performance**.—Fitch & Dutera, 2468 & 3276.
- Mechanical Elimination of Brownian and Other Fortuitous Deviations in Measurements**.—Bornstein & Milatz, 680.
- Designing Bucking-Out Systems**.—Hollister, 2052.
- Nomograms for Calculating Resistance of Cable Conductors, with Allowance for Skin Effect and Proximity Effect**.—Chernie, 683.
- 10 Megacycle Resistance Attenuator [for Measurements on Coaxial Cables]**.—Kobayashi & Usbikulo, 1648.
- Evaluation of Open and Closed Circuit Measurements on Homogeneous Cables**.—Sommer, 4070.
- Measuring Transmission Speed of Coaxial Cable**.—Wentz, 4069.
- Precision Measurement of Capacitance**.—Astbury & Ford, 1112.
- Measurement of Relative and True Power Factors of Air Capacitors**.—Astin, 1111.
- Maxwell's Bridge for comparing Self-Inductance with Capacitance at Carrier Frequencies, and Its Applications**.—Ogawa, Yamanaka, & Sato, 251.
- Simple Method of Capacity Measurement and Application to Determination of Variation of Capacity of String Electrometers with String Deflection**.—Tagger, 3691.
- Original Method of Comparison of Capacities at Radio Frequencies**.—Vaughan, 250.
- Capacity Meters**: see also Inductometers.
- Applications of Cathode-Ray Oscillograph to Measuring Purposes**.—Denontvignier, 2450 & 3686.
- Use of Lissajous Ellipse for Some Measurements with Cathode-Ray Oscillograph**.—Ouzounoff, 2449.
- Cathode-Ray**: see also Impulse, Null-, Voltage-Measuring.
- "Chopped-Signal" Vacuum-Tube Generator with Good Voltage Regulation**.—Williams & Fairweather, 3688.
- Circuit Magnification Meter**.—Marconi-Ekco, 2907.
- Movement Discontinuities of Clocks in Greenwich and Göttingen**.—Atkinson: Gockel & Schuler, 263.
- New Contribution to Question of Time-Keeping Irregularities of Clocks in Greenwich and Göttingen**.—Gockel, 4079.
- Performance of Crystal Clock observed during 6 Months**.—Koga & others, 2464.
- Frequency Demultipliers for Quartz Clock**.—Malatesta, 1635.
- Remark on Paper by Gockel & Schuler: "On a New Self-Driven Schuler Clock and Accuracy of Two Schuler Pendulums"**.—Scheibe, 267.
- Clocks**: see also Bridge-Stabilised, Pendulum, Time.
- Coaxial**: see Cable, Lines.
- Tuning Coils in Production**, 254.
- Measurement of "Quality" of Coils**.—G.W.O.H.: Opitz, 2906.
- Determination of Natural Wavelengths of Inductively Excited Iron-Cored Coils**.—Mühlinghaus, 253.
- Torque between Concentric Single-Layer Coils**.—Snow, 3280.
- Coils**: see also Circuit, Inductance, Toroids.
- Instruments for Measuring Temperature Dependence of H.F. Condensers**.—Rohde, 1644.
- Development of Small Variable Air Condenser compensated for Rapid Changes of Temperature**.—Thomas, 2455.
- Low-Range Air Condenser [Micrometer Type]**.—Ward & Pratt, 3693. For Condensers see also Capaci.
- Static Current Transformers for Measurement of Continuous Current**.—Vassilière-Arlhac, 4641.
- Measuring Apparatus for Very Intense Continuous Currents**.—Fortrat: Tsai, 4093.
- Continuous Currents**: see also D.C., Very-Intense.
- Measurement of Characteristics of Transmissions, at New Control Centre of Union internationale de Radiodiffusion**.—Adam, 3690.
- Crystal in Thermos Bottle**, 1634.
- Grid Bias for Crystal Oscillators**.—Bell, 264.
- Crystals [Properties and Applications of Quartz]**.—Dent, 262.
- Coupled Self-Excited Electrical Circuits and Crystal Oscillators**.—Heegner, 2040.
- 250-Watt Crystal Oscillator**.—Koga, Yamamoto, & others, 2450.
- "Text-Book on Crystal Physics" [Book Review]**.—Wooster, 2045.
- Crystals**: see also Clock, Detectors, Quartz, Rochelle-Salt, Twinning.
- Measurement of Current at High [and Ultra-High] Frequencies**.—Tani & Taharakuti, 2028.
- Current-Measurement**: see Ammeter, Photoelements.
- Sharp Cut-Off in Vacuum Tubes**.—Fett: Aiken & Birdsall, 686.
- Remarks on Damping of Measuring Instruments**.—Iliovici, 3284.
- Feedback D-C Meter**.—Brumbaugh & Vance, 248.
- Investigations on [Crystal] Detectors in Region of Very Short Waves**.—Rottgardt, 241.
- Dielectric Constants of Ammonium Halides**.—Guillien, 3285.
- Influence of Distortions due to Non-Linear Rectification of Measurement of Dielectric Constants by Beat Method**.—Khashtgir & Sirajuddin, 2035.
- Measurement of Dielectric Constant of Cellulose**.—De Luca, Campbell, & Maass, 252.
- Variation with Field-Strength of Dielectric Constants of *p*-Azoxy-anisols**.—Maier, 702.
- Measurements on the Dielectric Constant of CO₂**.—Michels & Kleerekoper, 4096.
- Frictional Dispersion of Dielectric Constants of Organic Liquids**.—Plötze, 703.
- Edge Correction in Determination of Dielectric Constant**.—Scott & Curtis, 3692.
- Dielectric-Heat-Losses**: see Voltages-& Frequencies.
- Cells for Measuring Electrical Properties of Small Samples of Dielectrics**.—Balsbaugh & Howell, 3696.
- New Method of Determining Properties of Dielectrics at Centimetric Wavelengths**.—Velasco & Hutchinson, 4066.
- Dielectrics**: see also Bridges, Loss, Rotation, Specific-Inductive.
- Stress Distribution in Aeolotropic Circular Disc**.—Okubo, 2462.
- Distortion-Measurement**: see Amplifier, Klirr-Factor.
- Notes on Dynamics of Instruments**.—Rich, 4088.
- Dynamron Method of Measurement of Dielectric Loss Angles at H.F.**.—Okazaki & Ohtsuka, 4619.
- Compensator for Radiation Method of measuring Oscillator Efficiency**.—Cowan, 4809.
- Method of Measurement of Elastic Constants and Phase Velocities of Transverse and Longitudinal Waves**.—Khol, 2044.
- Zero-Point Stability of Electrometer Valve Apparatus, and Determination of Zero Effects with Counter Tubes**.—Müller & Durichen: Osterwisch, 256.
- New Method of Stabilising an Electrometer Valve**.—Rogozinski, Gillod, 2057 & 2470.
- Apparatus for Charging Electrometer**.—Walch, 2471.
- Electrometers**: see also Capacity, Electrostatic.
- Search-Coil Oscillator for measuring Fields of Magnetic Electron Lenses**.—Klemperer & Miller, 2884.
- Electron-Multiplier for Measuring Ionisation Currents**.—Rann, 1109.
- Electrostatic Analyser for Complex Waves of Small Amplitude**.—Prescott, 2056 & 4086.
- Wide-Range High-Voltage Electrostatic Voltmeter**.—Nadig & Bohn, 4620.
- Laboratory Method for Measuring Energy Absorbed by Living Organism in Ultra-High-Frequency Field**.—Fridman, 2445.
- Field-Strength Measuring Set for Ultra-Short Waves**.—Binshtok, 667 & 2030.
- Design and Construction of a Short- [and Ultra-Short-] Wave Field-Strength Measuring Set**.—Colebrook & Gorton-Smith, 2029.
- Portable Field-Intensity Meter**.—Cosmani, 244.
- Relation of Carrying Car to Accuracy of Portable Field-Intensity-Measuring Equipment**.—Dewitt & Onberg, 1630.
- Accuracy of Radio Field-Intensity Measurement at Broadcast Frequencies**.—Diamond, Norton, & Lapham, 1629.
- Field-Strength Measuring Equipment for Wide-Band Ultra-High-Frequency Transmission**.—George, 3262.
- Frame Receiving Aerials [for Field-Strength Measurement]**.—Koch, 4630.
- Direct-Reading Field-Strength Measuring Instruments**.—Rohde & Spies, 1628.
- Double-Diode Field-Strength Measurements in Lower Decimetric Wave-Band**.—Santo Kimi, 3261.
- Ground-Wave Field-Intensity Measurements in New Zealand**.—Seale, 2469.
- Report to Commission I on Measurement of Radio Field Intensity**.—Smith-Rose, 2885.
- Field Strength, Intensity**: see also Broadcast, Short-Wave.
- Filament Currents of D.C. Valves: Method of eliminating Variations**.—Bedeau & Herman, 682.
- Filter**: see Quartz.
- Striated Luminous Glow of Piezoelectric Quartz Resonator at Flexural Vibration Frequencies**.—Harrison & Hooper, 2894.
- Frequency Dependence of Velocity of Propagation of Flexural Oscillations**.—Krista, 2895.
- Fractional-Frequency Generators utilising Regenerative Modulation**.—Miller, 3687.
- Production and Frequency-Measurement of Currents having Frequencies of 10 to 100 Cycles per Second**.—Clark & Katz, 270.
- Improvements in Execution of Measurements of Frequency**.—Fubini-Ghiron & Pontecorvo, 1066.
- Description of Frequency-Meter for Metric Waves, Type MD 61 S.A.D.I.R.**.—Ganet, 1624.
- Report on Standard Frequency Measurements at P.T.R. in 1935**.—Giebe, 4617.
- Utilisation of Absolute Frequency Meters for Scientific Requirements**.—Jouast, 2899.
- Frequency-Measuring Arrangement of High Accuracy**.—Kneser & Knötzel, 4074.
- Direct-Reading Frequency Meter**.—Kobavasi & Uchida, 259.
- Improvement in Constant Frequency Oscillators**.—Lampkin, 2888.
- New Method of Frequency Measurement ["Photographic Coincidence" Method]**.—Martin, 2468.
- Generation of Reference Frequencies**.—Meacham, 1639.
- Intercomparison of Absolute Values of Frequency Standards**.—Mitsuda, Tani, & Kusunose, 1099.

Measurements and Standards—

- Precise Measurement of Radio Frequencies.—Montuschi, 4618.
 Measurements of Frequency Stability and Harmonic Content of Valve Oscillators.—Nüsslein, 2454.
 Valve Frequency-Meter for Direct Indication at High Frequencies.—Pajetta, 2898.
 Daily Transmission by Deutschlandsender of Standard Frequency and Tuning Note from Quartz Clocks of Phys.-Tech. Reichsanstalt.—Schoibe, Adelsberger, 2467, 3277, & 3278.
 Frequency Investigations on Decimetric-Wave Transmitters by means of a Crystal Detector.—Schmidt, 3680.
 Frequency Measurements carried out by the Control Centre at Sesto Calende.—Sponzilli, 4075.
 Frequency Compensation for A.C. Instruments.—Sturm, 4091.
 Dependence of Internal Friction in Metals on Grain Size.—Randall, Rose, & Zener, 4078.
 Workshop Galvanometers.—Gall, 2059.
 Anti-Vibration Support for Sensitive Portable Galvanometers.—Gorton, 1652.
 Logarithmic Galvanometer.—Le Grand, 1106.
 Artificial Modification of Certain Galvanometer Constants.—Hochard, 681.
 Einthoven String Galvanometer used with Vacuum-Tube Micro-voltmeter.—Miles, 2915.
 Needle Vibration Galvanometer of High Sensitivity.—Rump, 4639.
 Automatic Arrangement for Correcting Zero Displacement of Galvanometer.—Tonnelat, 2060.
 Galvanometers: see also Magnetomotive, Null-Generators: see Fractional-Frequency.
 Mutual Inductance and Force between Two Coaxial Helical Wires.—Snow, 2037.
 Hot-Wire: see Wires.
 Resonance Curve Method for Absolute Measurement of Impedance at Frequencies of the Order 300 Mc/s.—Chipman, 1618.
 Bridge for Direct Measurement of Impedances.—Chrétien, 4627.
 Impedance Measurements in Decimetric-Wave Range.—Kaufmann, 2443.
 Meter for Measuring Apparent Impedance of Power Networks at Broadcasting Frequencies.—Lev, 1104.
 Parallel-Resonance Methods for Precise Measurements of High Impedances at Radio Frequencies.—Sinclair, 1619 & 4072.
 Impedance Measurements on Broadcast Antennas.—Sinclair, 4628.
 New Apparatus for Measurement of Impulse Times.—Breitenbruch & Filling, 2451.
 Impulse Measuring Set.—Grant & Macnee, 4623.
 Impulse Testing using Oscilloscope Equipment.—Siezen, 4622.
 Impulse: see also Voltages.
 Temperature Coefficient of Inductance.—Bell, 2886.
 Direct-Reading Inductance Indicator for Iron-Cored Coil carrying Direct Current.—Hayasi, 1649.
 Multi-Layer Coil Inductance Chart.—Maynard, 1637.
 Temperature Coefficient of Inductances for Use in a Valve Generator.—Moulin, 1101.
 Direct-Reading Apparatus for Measurement of Inductance at Radio-Frequencies.—Rutelli, 1105.
 Measuring Iron-Cored Inductances.—Scroggie, 1118.
 Dependence on Frequency of Temperature-Coefficient of Inductance of Coils.—Thomas, 1636.
 Nomogram for Inductance of Circular Ring.—Thomas, 2880.
 Inductances: see also Bridge, Capacitance, Inductometer.
 Precise High-Frequency Inductometer.—Herborn, 4087.
 Direct-Reading Inductometers and Capacity Meters based on Certain Properties of Oscillatory Circuits.—Rutelli, 673.
 Improved Disposition for Mirror, Pointer, and Scale in Precision Instruments.—Forester, 4640.
 Trends of Instrument Design.—Mason, 271.
 Recent Continental Advances in Principles, Construction, and Use of Scientific Instruments.—Pirani, 1625.
 Some Economical Considerations of Instrument Manufacture.—Kedding: Hinsley, 2050.
 Instruments: see also Damping, Dynamics, Frequency-Compensation, Logarithmic Measuring, Rectifying, Standards, Telegraphy, Thermionic, Transformers.
 Insulating Materials: see Dielectrics.
 Ionisation-Currents: see Electron-Multiplier.
 New H.F. "Klirr" Factor Meter.—Sudeck, 257.
 Correction to "Contribution to Leakage Calculation with Asymmetrical Disc Windings."—Knaack, 4073.
 Lecher Wire: see Resistance, Wires.
 Resonant Frequency of Closed Concentric Lines.—Hansen, 1622.
 Lines: see also Travelling-Waves.
 Electrical Instrument using Logarithmic Characteristics.—Awaya, Kobayasi, & Kawai, 1103.
 Logarithmic: see also Amplifier, Galvanometer.
 Loss Measurements on Dipole Liquids and Solid Commercial Insulating Materials, on Centimetric Waves.—Baz, 3695.
 Dielectric Loss Measurements at Radio-Frequencies.—Dunford & Goodall, 1110.
 Differential Condenser Method of measuring Dielectric Loss Angles at High Frequencies.—Itijo, 4618.
 Thermal Method of measuring Losses in Sheet Dielectrics at Radio Frequencies and High Electrical Stresses.—MacGregor-Morris & Gridale, 3694.
 Measurement of Large Loss Angles at Ultra-High Frequencies.—Malov, 1623.
 Improved Substitution Method for measuring Small Angles of Dielectric Loss.—Vodopyanov & Ivlev, 2034.
 Loss Measurements: see also Dynatron, Losses.
 Instrument for Magnetic Measurements.—Cocci & Sartori, 4095.
 Measurement of Steady Magnetic Fields by Magnetron Valves.—Gundlach, 1115.
 Possible Method for Determining Topography of Weak Heterogeneous Magnetic Fields.—Heller & Rabinovitch, 1116.
 Current Balance for measuring Magnetic Fields and Susceptibilities.—Kaufmann, 700.
 New Method of measuring Intensities of Magnetisation.—Schultz, 1650.
 Use of Bismuth-Bridge Magnetic Fluxmeter for A.C. Fields.—Smith, 2062.
 Suitability of Diamagnetic Crystal for Measurement of Magnetic Fields.—Stansfield, 697.
 Measurement of Magnetic Saturation Intensities at Different Temperatures.—Sucksmith, 3269.
 Magnetic: see also Bismuth, Electron-Lens, Temperature, Voltmeter, and below. Also under "Measurements and Standards."
 New Simple Magnetometer for Medium to Very Strong Fields.—Deubner, 698.
 New Induction Magnetometer for Absolute Measurement.—Filippini, 2478.
 Portable Direct-Reading Magnetometer.—Turney & Cousins, 699.
 Possibility of Realising a New Magnetometric Arrangement.—Valle & Tribulato, 4094.
 Researches on Inertial Latency of Magnetomotive Electrograph.—Tschermak-Seysenegg, 2473.
 Magnetostriction Resonators using Laminated Nickel Vibrators.—Fukushima & Koitbara, 4614.
 Multi-Winding Magnetostriction Vibrator.—Hayasaka, 4615.
 Radial Vibration of Magnetostrictive Ring Plate.—Suito & Aoyagi, 1100.
 Electrical Measuring Instruments [Physical Society's Exhibition, 1655 & 1656.
 "Die Messinstrumente..." [Germany's Measuring-Instrument Industry: Book Review], 272.
 Measuring Apparatus in Radio Technique.—Adam, 2049.
 "Radio-Frequency Electrical Measurements" [Book Review].—Brown, 678.
 Modern Requirements in Radio Technique for Measuring Apparatus and Manufacture in U.S.S.R.—Fedorov, 273.
 VDE Rules for Measuring Instruments.—Lieber, 677.
 Measurement(s): see also Book-Review, Brownian, Instrument, MPA-Apparatus, Oscillograph, Short-Wave, Very-Small, Voltage, Feedback, Micromicroammeter.—Roberts, 3697.
 Measurements of Currents, Voltages, and Impedances down to 20 cm [Micro-] Wavelength.—Strutt & Knol, 4067.
 Micro-Waves: see also Absorption, Detectors, Dielectrics, Field-Strength, Frequency, Impedance, Loss, Ultra-
 Millivoltmeters with Swinburne Temperature Compensation.—Averbukh, 4092.
 Direct-Reading Modulation Meter.—Tomituka, 2475.
 Electrical Methods of Measuring the Moisture of Disperse Bodies.—Alexandrov & Mikhailov, 1108.
 New Type of Direct-Reading Radio-Frequency Monitor.—Matsumura & Kanzaki, 258.
 M P A Apparatus (for Measuring, Testing, & Balancing).—Wilhelmy: Herterich, 2061.
 Multivibrators: see Chopped-Signal, Fractional-Frequency.
 Mutual Conductance Meter.—Aiken & Bell, 249.
 Mutual Conductance, Inductance: see also Helical-Wires, Valves.
 Null Detector for A.C. Bridge Measurements.—Binns & Webb, 2476.
 Electronic Null Detector for Impedance Bridges.—Lamson, 255.
 Cathode-Ray Null Indicator.—McNulty, 689.
 Continuously Variable Radio-Frequency Oscillator.—Aiken & Liu, 1641.
 Simple Note-Modulated Oscillator.—Dilda, 1102.
 Wide-Range Beat-Frequency Oscillator.—Hall, 1640.
 The 17b Oscillator [Range 1-150 kc/s.]—Means, 3274.
 Oscillators: see also Analyser, Bridge-Stabilised, Crystal, Efficiency, Frequency, Quartz, Ultra-High.
 Use of Mechanical Oscillographs in Production of Measuring Apparatus.—Damski & Voskoboynikov, 679.
 Maintenance of Motion of Pendulum by Alternating Current of Frequency High in Comparison with Natural Frequency of Pendulum.—Soulier: Bethenod, 676 & 2465.
 Pendulum: see also Clock.
 Resistance and Permeability Measurements at Ultra-High Frequencies.—Zottu, 3266.
 Inner, Initial, Magnetic Permeability of Iron and Nickel at Ultra-High Radio-Frequencies.—Glatbart, 3267.

Measurements and Standards—

- Permeability** : see also Wire.
Measurement of **Phase Shift** in Television Amplifiers.—Barco, 3263.
Method for Measuring **Phase Difference** between Oscillations at Integrally Related Frequencies.—Lyubchenko, 2038.
Method of Determining Sense of Small **Phase Differences**.—Sattler : Opitz, 3685.
Phase : see also Transit-Times.
H.F. Current Measurements with **Photoelements**.—Kuntze, 243.
Physical Society : see Measuring Instruments.
Piezoelectric : see Crystals, Potassium.
Piezoelectricity of Potassium Phosphate.—Lüdy, 4613.
Analysis of Specific Heat of **Potassium Dihydrogen Phosphate** at Upper Curie Point.—Bantle & Scherrer, 4077.
Measurement of Small **Potential Differences** by Double-Triode Valve in Bridge Circuit.—Brentano & Ingleby, 2053.
Microvolt **Potentiometer** Circuit.—Collins, 2912.
Accurate A.C. **Potentiometer** Measurements.—Diamand & Dzielwulski, 4634.
Photoelectrically Balanced Recording **Potentiometer**.—Fairchild & Parsegian, 685.
"Direct and Alternating Current **Potentiometer** Measurements" [Book Review].—Gall, 687.
Review of Design and Use of **Potentiometers**.—Gall, 2058.
Potentiometer for measuring Voltages of 10 Microvolts to Accuracy of 0.01 Microvolt.—Teele & Selhmann, 2913.
Method of Reducing Effect of Disturbances in Galvanometer Branch of **Potentiometer** Circuit.—Wenner, 2914.
Potentiometers : see also Rheostatic.
Power : see Energy, Impedance, Logarithmic, Resistor, Thermal, Valves, Wattmeter.
Pulse : see Impulse.
Q-Meter : see Circuit-Magnification, Coils.
Quality : see Q-Meter.
Quartz.—Arkhangel'skaya, 674 (Measurement of Parameters); Booth & Savers, 1633 & 3689 (for Coaxial Cable System); Fox & Stebbins, 2893 (Distribution of Energy in Laue Patterns); Günther, 2460 (Internal Friction); Hirsch & DuMond, 675 (X-ray Evidence on Nature of Surface Layers); Koga, 2042 (N.P.L. Notation), 2891 & 4612 (Equivalence of Two Q. Crystals); K. & Tatibana, 2458 (Anomalies of Thickness Vibration) & 2461 (Laue Photograph); Modrak, 1632 (Small Temperature-Coefficient); Rohde : Scheibe & Adelsberger, 2456 & 3279 (New Types); Sakamoto, 261 (Oscillator employing Beam-Power Valve) & 2041 (New Circuit); Schiffermüller, 1631 (Thin Discs with More than One Nat. Frequency); Seidl, 2890 (Mechanical Oscillations); Stanesby & Broad, 1633 (Coaxial Channel Filters); Uda, Honda, Watanabe, 1097 & 2457 (Variable-Frequency Q. Oscillators); Wulfson & Lombert, 2892 (Dispersion of Light); Zelyakh & Velikin, 260 (Equivalent Circuits of 4-Electrode Q.). See also Clock, Crystal, Disc, Flexural, Frequency, U.R.S.I.
Sensitivity Threshold of Gas Radiometer.—Wulfson : Haves, 2883.
Alternating-Current Measuring Instruments with Dry-Plate Rectifiers.—Boekels & Brosch, 690.
Curve Form Error in Ideal Rectifying Instrument.—Klutke, 691.
Reflection : see Absorption.
Systematic Measurements of High Resistances at High Frequencies.—Bressi, 4071.
Measurement of Complex Electrical Resistances at Ultra-High Frequencies.—Djakov, 2442.
Unit of Resistance.—Haak, 2916.
Resistance Measurement with Lecher-Wire System.—Klemt, 3677.
Use of Gas-Filled Lamps as High-Dissipation, High-Frequency Resistors, especially for Power Measurements.—Linder, 4082.
Measurement of High Resistance at High [and Ultra-High] Frequencies.—Saito, 2446 & 4608.
Investigations of the Resistance Material "Novokontakt".—Schulze, 3699.
Resistances : see also Cable, Permeability.
Methods of Tuning to Resonance.—Hegner, 1638.
Resonators : see Quartz.
Universal Abac for Graphical Solution of Problems of Rheostatic Control.—Fouille, 684.
Piezoelectric Behaviour of Crystals, with Special Reference to Rochelle Salt.—Ernsthausen, 266.
Elastic Deformations in Rochelle Salt.—Hinz, 2043.
Dynamic Measurement of Elastic, Electric, and Piezoelectric Constants of Rochelle Salt.—Mason, 2897 & 4076.
Anomalous Charging Current in Rochelle-Salt Crystals.—Seidl, 265.
Heat Capacity of Rochelle Salt.—Wilson, 1098.
Rochelle Salt : see also Potassium, and under "Acoustics & A. F."
Rotation of Dipoles in Solution.—Girard & Abadie, 704.
Short-Wave Radiation Measurements.—Gutton & Carbenay, 3684.
Modern [Ultra-] Short-Wave Receiving and Measuring Technique.—Sruitt, 669.
Soil : see Moisture.
Measurement of Specific Inductive Capacity of Diamonds by Method of Mixtures.—Whitehead & Hackett, 1113.
Stabilisation of Variable High-Voltage D.C.—Hackett, 4635.
Stabilisation, Stability : see also Amplifier, Bridge-Stabilised, Electrometer, Filament-Currents.
Standardisation of Tests on Receivers, 3272 & 4637.
"American Standards for Electrical Indicating Instruments" [Book Review], 1654.
"Institute of Radio Engineers Standards, 1938" [Book Review], 3701.
"National Physical Laboratory, Collected Researches : Standards" [Book Review], 3282.
Standards : see also Frequency.
Recent Developments in Measurement of Telegraph Transmission.—Shanck, Cowan, & Cory, 2047.
Measuring Instruments of Telegraphy.—Keller, 3700.
Remarks on "Curie" Scale of Temperature.—Kurti & Simon, 701.
N.P.L. Tests : New Publications relating to Facilities for Testing of Apparatus and Materials. 1120.
Wide-Band Variable-Frequency Testing Transmitters [for Ultra-Short Waves].—Usselman, 3264.
Thermal Power Meter of High Accuracy and Sensitivity : Calculations and Experiments.—Fischer, 2903.
Instruments incorporating Thermionic Valves, and Their Characteristics.—James, Polgreen, & Warren, 2048, 3283, 4089, & 4638.
New Type Vacuum Thermometer.—Amdur & Pearlman, 4085.
Thermocouple Meters.—Epperson, 2026.
Ultra-High-Frequency Thermocouple Instruments.—General Electric, 2882.
Some Experiments on Amplification of Thermocouple Electromotive Forces.—Gunn, 245.
Principles of Theory of Thermoelement.—Kovalenko, 1627 & 2027.
Thermopile for Low Temperature Radiation Measurements.—Moriyama, 3260.
Thermojunction Current and Voltage Meters in High-Frequency Technique.—Schmid, 3681.
Vacuum Thermocouples of Radiation Type.—Stack, 4610.
Remarks on Paper by Levitskaja, Frankfurt, & Cherpakov : "Determination of Inertia of Thermocouples."—Vulfson, 2448.
Thermoelements : see also Ammeter, Radiometer, Resistance, Short-Wave, Wattmeter, Wavemeter.
Production of Accurate One-Second Time Intervals.—George, 269.
Time : Question of Greenwich Civil Time versus Greenwich Mean Time.—Moore, 2900.
Times : see also Impulse, and below.
Method of Measuring **Time Constants** of Oscillating Circuits.—Marique, 2033.
Falling-Weight Time Switch : Its Standardisation and Application to Determination of Time Constant of Inductive Circuit.—Irons & Bennett, 2887.
Vector-Potential Field of Toroids carrying Currents.—Schenkel, 2453.
Instrument Current Transformers : the Self Determination of Errors.—Glynn, 2472.
Use of Auxiliary Current-Transformers for Extending Range of Metering Equipment.—Shotter, 1653.
New Measuring Set for Transient Phenomena.—Okuno & others, 2031.
Apparatus for measuring Phase and Group Transit Times at [Ultra-] High Frequencies.—Roosenstein, 1621.
Portable High-Frequency Transmission-Measuring Set.—Dickinson, 4090.
Transverse Waves : see Elastic Constants.
Travelling Waves : see Bridge.
Theory of Plastic Deformation and Twinning.—Frenkel & Kontorawa, 2463.
Formation of Elastic Twins during Twinning of Calcite Crystals.—Garber, 2896.
Variable Oscillator for Ultra-High-Frequency Measurements.—King, 3682.
Survey of Ultra-High-Frequency Measurements.—Nergaard, 1620 & 2447.
High-Q Tank Circuit for Ultra-High Frequencies.—Peterson, 4611.
Ultra-High-Frequency Measuring Assembly.—Saboroff, 2881.
Ultra-High, -Short : see also Admittances, Ammeter, Current, Energy, Field-Strength, Frequency-Meter, Impedance, Inductance, Instruments (Pirani), Loss, Micro-Wave, Permeability, Resistance, Short-Wave, Testing, Thermo-, Transit-Times, Voltage-Measuring, Voltages- & Frequencies, Wavemeter.
Simultaneous Determination of Resistances, Currents, and E.M.F.s in Absolute E.M. Units.—Guillet, 1119.
Recent Comparisons of Electrical Units of Various Countries.—Perard, Romanowski, & Roux, 4080.
Adjustment of Electrical Units.—Vigoureux, 4081.
U.R.S.I. Reports to Commission I.—Rayner : Petritsch, 2889.
U.R.S.I. : see also Field-Intensity.
Precision Method for Measurement of Mutual Conductance of Thermionic Valves.—Astbury, 4624.
Determination of Operating Characteristics of Power Vacuum Tubes, also Predetermination of Performance of R.F. Amplifiers, and Improvements in Measurement of Direct Inter-Electrode Capacitances of Vacuum Tubes.—Chafle : Roys : Williams & Soukara, 3270.
Valve Testing Panel for measuring "Durchgriff," Slope, and

Measurements and Standards—

- Internal Resistance by means of Alternating Current.—Helmholz, 2474.
- Difficulties in Measuring H.F. Output of Air-Cooled Valves at Frequencies below 20 Mc/s.—Heyboer, 2901.
- Bridge-Type Set for measuring Vacuum-Tube Parameters.—Pernice, 2051.
- Method of measuring Vacuum-Tube Coefficients.—Polk, 4625.
- Valves : see also Cut-Off, Filament-Currents, Vacuum-Tubes, Voltmeters.
- Papers on Measurement of Very Intense Continuous Currents.—Cotton : Tsai, 696.
- Very Low Frequencies : see Frequency-Measurement.
- Arrangement for Control or Measurement of Very Small Alternating Currents.—Gambetta, 3275. For D.C. see Micro-micro—.
- New H.F. Method of Measurement [of Voltage and Frequency] using the Dielectric Heat Losses.—Gundlach, 3259.
- Use of Dark Pre-Discharge Current in Air for Measurement of L.F. Voltages.—Hess, 695.
- Cathode-Ray Tube as Voltage-Measuring Apparatus for Ultra-Short Waves.—Hollmann, 240.
- Measurement of Chopped Impulse Voltages by Riken Crest Voltmeter.—Ishiguro & Goshō, 4621.
- Measurement of High-Frequency Voltages and Impulse Voltages of Very Short Duration, with Sphere Spark Gap.—Jacotet, 1651.
- New D.C.-Voltage Transformer for Measurement of High D.C. Voltages.—Kraemer, 692.
- New Method of Curve Measurement at High Voltages.—Linckh, 693.
- Production and Measurement of Small Voltages at Radio Frequencies.—Pinciroli, 4084.
- Frequency-Independent Capacitive-Ohmic Voltage Dividers for Measuring Purposes.—Zinke, 4626.
- Valves with Sharp Bends in Anode-Current/Grid-Voltage Characteristics, for Valve-Voltmeters, 672.
- Special Valve Voltmeter with Overload Protection.—Aiken & Liu, 1642.
- Electronic Voltmeter using Feedback.—Ballantine, 247.
- Improvement of Rogowski's Magnetic Voltmeter.—Baum, 2910.
- New Light-Beam Electrostatic Voltmeter.—Bialou & Malpica, 694.
- 6H6 A.C.-D.C. Voltmeter.—Carter, 2477.
- Low-Reading Mean Voltmeter.—Greig & Wroe, 1117.
- Mechanical-Electrical Negative-Feedback System for Valve Voltmeters with Logarithmic Indication.—Keidel, 3698.
- Standard Voltmeter with Adjustable Sensitivity for High Voltages.—Nacken, 2055.
- Logarithmic Voltmeter with Differential Indication.—Nuovo, 2909.
- Self-Checking Vacuum-Tube Voltmeter.—Paine, 4633.
- New Idea in Valve Voltmeter Design.—Pollard, 2054.
- High-Voltage Valve Voltmeter for High Frequencies.—Rohe, 1643.
- Miniature Valve Voltmeter.—Salford Elec. Instr., 671 & 1626.
- Valve Voltmeter with Four Ranges.—Shevchuk, 670.
- Push-Pull-Stabilised Triode Voltmeter.—Williamson & Nagy, 246.
- Recording Generating Voltmeter for Lightning Studies.—Workman & Holzer, 2911.
- Voltages, Voltmeters : see also Bucking-Out, Electrometer, Electrostatic, Galvanometer, Potential-Differences, Potentiometer, Voltage-Divider, VoltOhmyst.
- The Rider " VoltOhmyst," 3273.
- Thermal Wattmeter for High-Frequency Circuits.—Maione, 2904.
- Valve Wattmeter.—Myers & Clothier, 4632.
- Experiments on an Electronic Wattmeter.—Vallese, 4033.
- Wattmeters using Non-Linear Impedances.—Vartelski, 2905.
- Wattmeter : see also Power, Thermal.
- Compact, Sensitive Wavemeter [for Ultra-Short Waves].—Brown, 3679.
- High-Frequency Wavemeter.—Meahl, 3678.
- New Type of Wavemeter for Ultra-Short Waves.—Miyamura, 242.
- Precision Wavemeter for Ultra-Short Waves.—Uda, 1095.
- Electric Waves in Single-Wire and Parallel-Wire Systems : Permeability of Iron and Nickel.—Lindman, 3268.
- Investigations on Wires heated by Electric Currents.—Fischer, 2902.
- Wave Propagation along Wires.—Placinteanu, 3676.

SUBSIDIARY APPARATUS AND MATERIALS

- Absorption of 1.65-7.2 cm Waves.—Kebbel, 2522.
- Conditions of Production of Rapid Carriers by H.F. Multiple Acceleration.—Schlosser, 1142.
- Investigation of Linear Accelerator.—Hartman & Smith, 4673.
- Zinc/Iodide/Carbon Accumulator.—Balbi & Boulding, 1692.
- Accumulator Charging in the Wilds.—Cazaly, 4719.
- Accumulators : see also Wind.
- Papers on Theory of Adsorption.—Roberts : Dube, 1157.
- Magnetic After-Effect.—Koch, 1280.
- Magnetic & Mechanical After-Effects and Chemical Constitution.—Snoek, 1726 & 3785.
- Magnetic After-Effects at Higher Inductions.—Snoek, 4724.
- After-Effects : see also Viscosity.
- Electric Strength of Air at High Frequencies.—Seward, 1703.
- Electric Strength of Air at High Pressure.—Skilling, 3741.
- Electrical Breakdown of Alkali Halides.—Seeger & Teller, 291.
- Magnetic Susceptibility of Gold/Copper, Gold/Silver, Silver/Copper, and Copper/Nickel Alloys.—Broniewski & others, 1262.
- Magnetic Alloys and Problems of Metallic Structure.—Stoner, 1271.
- Paramagnetic Susceptibility of Copper/Nickel and Zinc/Nickel Alloys.—Wheeler, 785.
- Alloys : see also Alnico, Cupaloy, Electro-Magnet, Ferromagnetic, Iron, Nickel, Permalloy, Permanent-Magnet, Platinum, Superstructure, Titanium.
- Alnico—Its Properties and Possibilities.—Adams, 2129.
- New Insulator [Alsilim, from Clay].—Hanser, 758.
- Machinable Ceramic Material, and Properties of " Alsimag 222."—American Lava, 4700.
- Alternating Currents : see Filtering, Very-Small.
- Use of Aluminium as Cable-Sheath Material.—Czempiel & Haase, 4197.
- Aluminium : see also Iron, Ternary.
- Amalgams : see Copper.
- Linear Coefficient of Thermal Expansion of Ambroid.—Yetter, 2974.
- Studies of the Amorphous State.—Various Russian Writers, 773 & 2116.
- Electric Breakdown of Amorphous Materials.—Shimizu & Takahasi, 4688.
- Investigations on Constancy Range of Counter Tubes and Resolving Power of Amplifiers.—Forsman, 3317.
- Operational Treatment of Design of Electro-Magnetic Time-Base Amplifiers.—Jofeh, 4656.
- Intermittent Amplifier for Rapid Counting of Geiger-Müller Impulses.—Kowarski & Winter, 1197.
- Wide-Range Video Amplifier for Cathode-Ray Oscilloscope.—Preisman, 3289.
- Multi-Channel Oscillograph Amplifier [" Intermittent " Method].—Vogel : Williams & Beattie, 2071 & 2943.
- Voltage Regulator applied to an Amplifier.—Waltz : Bousquet, 1690.
- Direct-Voltage Amplifier [for All Frequencies from 0 to 10 000 c/s].—Wheatcroft, 1216.
- Periodic Wave Analyser.—Kiemperer, 2565.
- Magneto Electric Anisotropies.—Perrier & Mermod, 1736.
- Anisotropy : see also Magnetic.
- Anomalous Magnetic Properties of Anhydrous FeCl₃.—Shalyt, 2980.
- Anomalous Dispersion and Free Rotatability.—Budó, 1233.
- Experimental Study of Antiferromagnetism [Chromium Compounds].—Foex & Graf, 4205.
- Aperture Error of Electrostatic Tube Lenses.—Gundert, 4103.
- Determination of Conditions of Functioning of A.C. Arc.—Bethend, 2101.
- Investigations on Internal Oscillations of Low-Voltage Arcs.—Funk & Seeliger, 4177.
- Autoelectronic Emission in Metal Arcs.—Huxford, Eskin, & Jones, 4178.
- Arcs of Various Metals in Capillary Tubes.—Voss, 736.
- Asbestos : see Glass.
- New Atom Smasher uses Short-Wave Radio Generator.—Smith & Hartman, 2087.
- Migration of Barium on Molybdenum.—Benjamin & Jenkins, 2080.
- Partition Energy for Large Barkhausen Discontinuities.—Döring & Haake, 1724.
- Barrier-Layer : see Crystal, Dry-Plate, Rectifiers (Kaestner), Semiconductor.
- Primary Batteries according to Recent Patents.—Jumau, 2559.
- Standards for Galvanic Elements and Batteries.—VDE, 4718.
- Electronic Emission as Substitute for Battery.—Taft, 1215.
- Dielectric Strength of Benzene and Heptane.—Dornet, 4160.
- Dielectric Constant of Benzene, and Dielectric Constant, Dipole Moment, and Molecular Polarisation of 1,4 Dioxane (C₄ H₈ O₂)—Vaughan, 3329.
- Investigations on Magnetically Oriented Bismuth.—Altma, 1265.
- Magnetic Properties of Bismuth.—Shoenberg, 783 & 3356.
- Technique of High-Intensity Bombardment with Fast Particles.—Kurie, 2082.
- Magnetic Properties of Brass with Admixture of Iron.—Kuznecov, 1264.
- Electronic Breakdown in Solid Dielectrics.—Austen & Hackett, 2970.
- Theory of Electrical Breakdown of Solid Insulators.—Franz, 4139.
- Variation in Breakdown Voltage of Molecular Gases due to Irradiation.—Fucks & Schumacher, 4179.
- Breakdown Studies in Compressed Gases.—Howell, 3742.
- Breakdown Strength of Insulators between Plane Electrodes, especially for D.C. Voltage.—von Keller, 1712.
- Breakdown Voltage in Mercury Vapour.—Klarfeld & Gusjeva, 731.
- Theory of Breakdown.—Rogowski, 3336.
- Thermal Breakdown of Solid Insulators.—Shimizu, 1231.
- Progressive Breakdown in Conducting Liquid.—Snoddy & Beams, 3332.
- Electric Breakdown of Liquid Dielectrics : of Alcohol Solution.—Toriyama, 1240 & 2529.

Subsidiary Apparatus and Materials—

- Electrical Breakdown of Rock Salt at High Temperatures.—Walther & Inge, 1232.
- Breakdown**: see also Air, Alkali-Halides, Amorphous, Crystals, Dielectrics, Humidity, Paper, Rare-Gases.
- Bridge Grid Circuits** (Regulating Circuits).—Vartelski, 748.
- Current Rating and Impedance of Cables**.—Booth, Hutchings, Whitehead, 745.
- Magazine Plate Camera for Photography in Vacuum**.—Fitzsimmons, 724.
- Recording Camera**.—Southern Instruments, 2944.
- Pressure Capacitors, 3743 & 4697.**
- Measurement of Power Factors of Air Capacitors**.—Astin, 1220.
- Nature of Energy Losses in Air Capacitors at Low Frequencies**.—Astin, 4156.
- Negative Power Factors in Air Capacitors**.—Curtis, Astin, 2109 & 4155.
- "Electrolytic Capacitors" [Book Review].—Deeley, 2110.
- Fabricated-Plate Capacitors**.—Peck, 751.
- Method for Diminishing Sticking of Mercury in Capillaries**.—Rosenberg, 1212.
- Variation with Temperature of Resistance of Carbon and Graphite**.—Collier, Stiles, & Taylor: Powell & Schofield, 1208.
- "Columbian Colloidal Carbons" [Book Review], 2952.
- Carbon Steel**: see Iron.
- Radiation of Matter accompanying Electron Beam Emission from Incandescent Cathodes**.—Reichelt, 3712.
- Cathodes**: see also Dispenser.
- Question of Cathode Jump**.—Haake & Walcher, 1189.
- Preliminary Investigation of Cathode Rays**.—Truinp, van de Graaff, & Cloud, 4651.
- Cathode-Ray Oscillographs, Tubes**.—von Ardenne, 4645 (Book Review); Beale, 1664 (at Phys. Society's Exhibition); Bigalke, 2479 (4-Beam Tube with High Recording Velocity); Bigalke & Pieplow, 2481 (Portable High-Vacuum Oscillograph); Bigalke, Schwartz, 278 (Post-Acceleration); Boile & Glöde, 2487 (Danger of X-Ray Production); Buchkremer, 279 (New Constructive Development); Chard, 708 (Determination of Phase Angle & Symmetrical Components); Cossor, 2941 (Automatic Brilliance Control Unit); Demontvignier, 2065 (Principles & Construction) & 2484, 3706 (Applications to Measuring); Douma & Zijlstra, 1685 (Determination of Transmitting-Valve Characteristics); Du Mont, 2919 (Intensifier-Type, Post-Acceleration); General Electric, 2920 (Monitor Tube); Hollmann, 274 (Inversion Spectrum); 275 (Voltage Measuring for Ultra-Short Waves); 1128 (Transverse Control in Multiple-Phase Fields); 705 (Ultra-dynamic Overcontrol); 2480 (Overcontrol Spectrum); H. & Thoma, 1659 (Dynamic Ballistics); Katz & Westendorf, 4098 (High Recording Speeds with Sealed-Off Tube); Kleinwächter, 2488 (Application to Solution of Diff. Equations); McGillevie, Wilkinson, 281 & 707 (recording High-Speed Transients); Metal, 2067 (for testing Current Transformers); Mezger, 2942 (Design Considerations); Nentwig, 3288 (Suppression of Interference); Ozounoff, 2485 (Use of Lissajous Ellipse); Paehr, 3703 (Danger of X-Ray Production); Pieplow & Stuedel, 277 (Symmetrisation with Electrostatic Deflection); Puckle, 2066 (History of Development); Reusse, 3709 (Charge Distribution); Rogowski & Thielen, 4097 (Post-Acceleration); Schneider, 280 (recording Surges); Schwartz, 3702 (Post-Acceleration); see also Bigalke; Scroggie, 2482 (Cossor Double-Beam Tube); van Suchtelen, 1663 (Applications); Thielen, 2918 (Sensitive 2-Beam High-Power Oscillograph); Thoma, 706, 3704 & 4644 (Ultradynamic Transverse Deflection, etc.; see also Hollmann); Vogel, 1122 & 3287 (Recording Transients) & 3286 (Multi-Way Electronic Commutator for Simultaneous Recording); Vogel & Cuih , 2064 (Transportable O. for Transients).
- Cathode-Ray**: see also Amplifier, Camera, Cathodes, Cold Cathode, Deflecting (ion), Electron-Beams, Electron-Bombardment, Electron-Gun, Electron-Lens, Electron-Streams, Electronic-Waves, Energy-Equation, Equations-of-Motion, Impulse, Ions, Oscillograph (scope), Phase-Focusing, Phosphor-, Photography, Screen, Shields, Switch, Time Base, Sweep.
- Measurement of Dielectric Constant of Cellulose**.—De Luca & others, 311.
- Porcelain/Metal Cement**.—Wedmore, 4670.
- "Hochfrequenz-Keramik" [Ceramics: Book Review].—Albers-Sch nberg, 4701.
- Dielectric Loss in Ceramics at High Frequencies**.—Bogoroditski & Friedberg, 4146.
- Ceramic Insulators and Affinity for Water**.—Cochrane: Hartshorn, 3324.
- Some Ceramic Manufacturing Developments of Western Electric Company**.—Johnson & Shaw, 3325.
- Properties of Ceramic Materials**.—Thurnauer, 3759.
- Ceramics**: see also Alsi-, Condensers, Glass, Steatite.
- Focusing of Charged Particles by Spherical Condenser**.—Purcell, 714.
- Chemistry and Communications**.—Glover, 2125.
- Chokon**, New Radio Component.—Inuma, 1217.
- Ferromagnetic Compounds of Chromium**.—Bates & Taylor, 1275.
- Magnetic Study of Oxides of Chromium and Manganese**.—Bhatnagar, Kapur, & Prakash, 4204.
- Chromium**: see also Antiferromagnetism.
- "Clean-Up" under Canal-Ray Discharge.—Chiplonkar, 2949.
- Wilson Cloud-Chamber with Several Expansions per Second**.—Brinkman, 3318.
- Cobalt**: see Iron, Permanent-.
- Coils**.—Braun, 4184 (Loxus Curves of Resistance of Iron-Cored Cs.); Chistyakov, 774 (Design of Low-Power Transformers & Cs.); Hauffe, 2128 (Iron-Cored Cs. with Superposed D.C. Magnetisation); Henniger, 3782 (Various Core Shapes); Joyner & Landon, 304 (Progressive Universal Cs.); Koch, 3348 (Use of Ferromagnetic Materials in Cs. for R.F.); Maus, 2126 (H.F. Cs. with Iron-Ribbon Cores under Variable Superposed D.C. Magnetisation). See also Electro-Magnets.
- Cold-Cathode-Ray Oscillograph for Very Low Exciting Voltages**.—Thielen, 4642.
- Cold-Cathode Gas-Filled Tubes as Circuit Elements**.—Ingram, 4167.
- Theory of Collector Currents in Plasma disturbed by Magnetic Field**.—Spiwak & Reichrudel, 2497.
- Magnetisation of Ferromagnetic Colloids**.—Elmore, 1259.
- Investigations of Electric Field in Plate Condenser with Liquid Dielectric by Means of the Electro-Optical Kerr Effect**.—Vafiadis, 3328.
- Moulded Silver/Mica Condensers**, 4696.
- Ceramic Trimer Condensers**, 4698.
- Electrolytic Condensers**: Principle, Characteristics, and Special Features, 4157.
- "Inductive" and "Anti-Inductive" Paper Condensers.—Ferrari, 4694.
- Influence of Self-Inductance of Roll-Type Condensers on Their Impedance**.—Linder & Schneidermann, 4695.
- Condensers**.—Andr , 4158 (Electro-chemical); Coursey & Ray, 2111 & 3747 (Electrolytic); Godes, Zakheim & Novoselov, 3746 (Increasing Capacity of Anode Foil for Electrolytic Cs.); Gohn, 3327 (Extruded Lead Casing); Muirhead, 3744 (Variable Air C.); Nelepets, 753 (Losses in Electrolytic Cs.); 1218 (Terminology) & 1219 (Testing Electrolytic Cs.); Opitz, G.W.O.H., 2978 (Cs. free from Inductance); Roide, 1702 (Temperature Dependence of Cs.); Solar, 3748 (Wax-Moulded Paper Cs.); Stafford, 2975 (Tubular Paper Cs.); Thomas, 2532 (Small Variable Air C. compensated for Rapid Temperature Changes); Walther & Inge, 750 (Paper Cs. with Halowax); Ward & Pratt, 3745 (Low-Range Air C.); Zakheim & Nikolaeva, 753 (Dynamic Forming of Aluminium); Zechmal, 308 (Losses in Circular-Plate Cs.).
- Condensers**: see also Air, Breakdown-Studies, Capacitors, Charged-Particles, Chokon, Conducting-Particles, Deflecting, Electron-Beam, Polystyrene, Pyranol, Voltage.
- Apparatus for Detection of Conducting Particles in Condenser Paper**, 1706.
- Static Constant-Current Circuit**.—Summers, 740.
- Heating of Point Contacts with Constant Current Load**.—Avramescu, 4191.
- Wear of Electrical Contact Points, and Pre-Arc Stage of Electrical Contact Points at Opening**.—Hoh: Katayama, 4716.
- Note on Contact between Metal and Insulator or Semiconductor**.—Mott, 1171.
- Contacts**: see also Relay.
- "Rhythmic" Control Apparatus, 4187.
- Control**: see also Constant-Current, Current, Smoothing, Speed, Thyatron, Very-Small, Voltage-Regulation.
- Separately-Driven D.C./A.C. Converter in Push-Pull Circuit**.—Ostendorf, 1166.
- Magnetic Properties of Copper Amalgams**.—Bhatnagar & others, 1263.
- Copper**: see also Alloys, Iron, Magnetic, Permanent-, Zinc-Sulphide.
- Copper-Oxide Rectifier**.—Dubar, 4683.
- Applications of Copper-Oxide Rectifiers**.—Beranek, 4684.
- Copper-Oxide**: see also Barrier-Layer, Dry-Plate, Electron-Diffraction, Thermovoltage.
- Mechanism of Negative Point-to-Plane Corona near Onset**.—Trichel, 1188.
- Portable Recording Tube Counter Circuit**.—Coven, 1196.
- Circuits for Control of Geiger-M ller Counters and for Scaling and Recording Their Impulses, and New Vacuum-Tube Counting Circuits**.—Johnson: Reich, 1195.
- Extinction of Discharges in Geiger-Counters**.—May, 1193.
- Cause of Sudden Stoppage in Counter Discharges (Statistical Fluctuations in Electron Supply)**.—Schade, 1199.
- High-Speed Counter for Electrical Impulses**.—Severini, 1198.
- Thyratron Counter of High Counting Speed and Its Development as Recording Chronograph**.—Uffelmann, 1192.
- Counters**: see also Amplifiers, Counting, Light, Potential-Source, Radiation, Spark.
- Method of employing Ordinary Mechanical Counting Devices for Phenomena in Rapid Succession**.—Kwal & Lesage, 1200.
- Complete Geiger-M ller Counting System and Portable Geiger Unit**.—Lifschutz: Curtis, 1696.
- Counting Losses in Geiger-M ller Counter Circuits and Recorders**.—Lifschutz & Duffendack, 737.
- Crystals**.—Buehl & von Hippel, 4140 (Temperature Dependence of

Subsidiary Apparatus and Materials—

- Breakdown in Single Cs.); Dektjar, **1732** (Influence of Elastic Stresses on Initial Susceptibility of Mono-Cs.); Fröhlich, **3765** & **4138** (Theory of Breakdown in Ionic Cs.); F. & Mott, **3313** & **4131** (Mean Free Path of Electrons in Polar Cs.); Goodwin, **2957** & **4137** (Electronic States at Surfaces); Hilsch, **4686** (Electron Conduction); H. & Pohl, **1683** (Control of Electron Currents with Three-Electrode C., and Model of Barrier Layer); von Hippel, **772** (Electronic Conduction in Insulating Cs. under Very High Field Strength); Krishnan & Baueriee, **1270** (Mag. Anisotropies & Valencies of Paramag. Atoms); Künch & Penney, **1276** (Mag. Susceptibilities of Rare-Earth Cs.); Rottgardt, **302** (Crystal Detectors in Micro-Wave Region).
- Crystals**: see also Curie-Point, Dry-Plate, Electron Bombardment, Ferromagnetic, Heat-Treatment, Magnete-Crystalline, Nickel, Peralloy, Phosphors, Rectification, Thallium.
- Cupaloy**, New Alloy with High Mechanical Strength and Conductivity.—Brace, **1207**.
- Relations between **Curie Point**, Orbital Moment, and Crystalline Lattice.—Forrer, **1725**.
- Researches on Direct Production of Electric Current by Combustion of Gases.—Hirschfeld & Vanduzer, **2103**.
- Precision **Current Control Device** [used for Cyclotron].—Lawson & Tyler, **2106**.
- Cyclotrons**.—**715** & **3722** (Paths of Ions); **1136** & **2929** (ditto); **1137** (Upper Limit of Ion Energy); **1133** (Magnitude of Accelerated Current); **1139** (Internal Targets); **2086** (Capillary Ion Source); **2496** (Recent Developments, Applications, etc.); **3305** (Dee Voltmeter & Resonance Indicator); **3723** (at Chicago & Purdue Universities); **4114** (60-Inch C. at University of California); **4115** (High-Intensity Bombardment Technique); **4672** (Measurement of R.F. Voltage). See also Current, Needle-Valve.
- D.C. Transformers**: see Transformer, Voltage.
- D.C. Voltage**: see High-Voltage, Voltage.
- Deflection of Electron Ray in Cathode-Ray Tube by Magnetic Fields produced by Coils**.—Bähring, **3705**.
- Electrostatic Deflection in Cathode-Ray Tubes with Non-Parallel Plates**.—Flechsiz, **4643**.
- Deflection Errors of Electric and Magnetic Deflecting Systems**.—Glaser, **1658**.
- Theory of Electron Movement in Deflecting Condenser**.—Recknagel, **293** & **1660**.
- Image Defects of Magnetic Deflecting Fields**.—Wendt, **3290**.
- Detection of Single Positive Ions, Electrons, and Photons by Secondary-Electron Multiplier**.—Allen, **4130**.
- Detectors**: see Crystal.
- Dielectans**: see Dielectrics (Landt).
- Dielectrics**.—**3756**, Galileo Ferraris Institute, Researches on Solid Ds.; Clark, **768** (Chemistry & H.T. Ds.); Doust & Sulston, **2115** (Properties & Testing); Gemant, **1709** (Rôle of Solid Friction in Synthetic Ds.) & **4143** (Ionic Mobility in Solid Ds.); Glockler & Lind, **2523** ("Electrochemistry"; Book Review); Hartshorn, **1234** (Molecular Models); Honda, **4711** (Discharges in Two-Layer Ds. with Impulsive Voltages); Landt, **1707** (Behaviour of Solid Ds. at High Frequencies); Aarvysael, **757** (Perforation of Solid Ds.); Murphy & Morgan, **766** & **4689** (D. Properties of Insulating Materials); Velasco & Hutchinson, **4161** (New Method of determining Properties at Centimetric Wavelengths); White, **2973** (Hindered Molecular Rotation & D. Behaviour of Condensed Phases). See also Insulating, Surge, Thermal, and below.
- Dielectrics having High Dielectric Constant**.—Morita & Suzuki, **2112**.
- Edge Correction in Determination of Dielectric Constant**.—Scott & Curtis, **3753**.
- Dielectric-Constants**: see also Anomalous-Dispersion, Benzene, Electrolytes, Insulating, Plastics, Relaxation, Solidification, Transition, and under "Measurements & Standards."
- "Elektrische Stossfestigkeit" [**Dielectric Strength** against Surges: Book Review].—Strigel, **4153**.
- Discharges**.—Askinazi, **4185** (Large Electrodes in Gaseous D. Plasma); Barlow, **4168** (Protection of Cold-Cathode Luminous D.-Tube Installations); Büttner, **2515** (Townsend D. in Noble Gases); Debus & Huetter, **2511** (Polarity Indicator); Dietrich & Snoddy, **2964** (Impulse Breakdown in Long D. Tubes); Fabrikant, **2519** (Excitation of Atoms); Garton, **4186** (Heavy-Current Hydrogen D. Tube); van Geel & Kerkom, **1194** (Instability in Corona D., especially in Geiger Counters); Granovsky, **2963** (Time of Restoration); Katayama, **1182** (Single-Electrode Low-Frequency D. & Its Applications); Merrill & Webb, **2965** (Plasma Oscillations in Low-Pressure Ds.); Newman, **1178** (In Argon); Nöller, **299** (Electron Temperature & Light Excitation in Gas Ds. excited by Short & Ultra-Short Waves); Okabe & Seva, **4709** (U-H-F Ds. on Heat-Resisting Materials); Owaki, **4677** (ditto in Air); Ricamo, **1183** (Flash D. in Subnormal Region); Rusk, **735** (Collector Electrode Currents); Sena & others, **1187** & **2520** (Conference on D. in Gases & Applications); Sinelnikov, **725** (D. Tube for 3 Million Volts); Smith, Hartman, Dietrich, & others, **4173** (Miscellaneous Papers); Thornton, **3335** (Strength of Gases measured by Corona D.); Toepfer, Brinkman, **2513** (Striking Voltage & Distance in Air); Weizel, Rompe, & Schön, **4175** (Theory of Cathode-D. Portion of Low-Pressure D.).
- Discharges**: see also Arc, Cathode-Jump, Clean-Up, Cold-Cathode, Counter, Dielectric, Dispenser-Cathode, Doppler-Effect, Eddies, Electrode, Electron-Emission, Electron-Scattering, Electron-Temperature, Glow-Discharge, Heat-Conduction, Kipp-Oscillations, Lamps, Luminescent-Probe, Neon-Tube, Permatron, Phase, Pulse, Velocity-Modulation, Wall-Deposits.
- Dispenser-Cathode**: see New Type of Thermionic Cathode for Gaseous Discharge Tubes.—Hull, **4165**.
- Doppler Effect and Field Distribution in Haier Canal-Ray Tube**.—Sherwin & Dempster, **4184**.
- Transport of Electric Charges by Droplets**.—Moreau-Hanot, **3304**.
- Semi-Automatic Cell-Testing Device for Dry Cells**.—Vernan & Joglekar, **4717**.
- Dry-Plate Rectifiers**.—Baudisch & Kafka, **1172** (Improving the Output of Copper-Oxide Rs.); Blochinzev & Davydov, **2960** (Contributions to Theory); Davydov, **1684** (Rectification at Boundary: Theory of Solid Rs.); Giroz, **3311** (with Anti-Compound Characteristics); Joffe, Davydov, & others, **4133** (Symposium); Kotterman, **3774** (Magnesium/Copper-Sulphide Charger); Lange, **2961** (Course of Electrochemical Potentials in Cuprous-Oxide R.); Levinson & Dunae, **2099** (High-Power Copper-Oxide Plates); Mater, **1686** (Physics & Technique of Dry Rs.) & **3312** (Selenium R.); Mott, **2563** & **4136** (Theory of Crystal Rs.); Müller, **1170** (Theoretical Considerations on Copper-Oxide R.); Stange, **1169** (Selenium & Copper-Oxide Rs. in Current-Supply Installations); Stefanovski & Erivot, **1168** (Selenium Rs.); Tamn & Bath, **2562** (Exponential Characteristic of Copper-Oxide Rs.).
- Dry-Plate Rectifiers**: see also Barrier-Layer, Contact, Copper, Electron-Diffraction, Selenium, Semiconductor.
- Cellular and Banded Electroconvective Eddies in Gases**.—Luntz, **3740**.
- Introduction to Physics of Eddy Currents [and Screening]**.—Hameister, **1245**.
- Electrode Consumption due to Arc Discharge**.—Hoh, **4675**.
- Electrographic Recording of Fast Electrical Phenomena**.—Selényi, **282**.
- Dependence on Voltage of Dispersion of Dielectric Constants of Strong Electrolytes**.—Fröhlich, **4124**.
- General-Purpose Electro-Magnet [with Permeandur Cores]**.—Cherwidde, **4213**.
- Design and Temperature Rise of Air-Cooled Coils [for Electro-Magnets]**.—Golding, **1241**.
- Magnetisable Spacing Plates for Electro-Magnets**.—Gundlinger, **1737**.
- Design of Windings for Electro-Magnets of High Field Strength**.—Kanter, **781**.
- Apparatus for Charging Electrometer**.—Walch, **2561**.
- Emission of Electrons from Copper, Silver, and Aluminium on Impact of High-Velocity Ions**.—Grassmann, **4113**.
- Penetration of Low-Speed Electrons through Thin Mica Film**.—Kato & Takada, **2491**.
- Mean Free Path of Electrons in Mercury-Vapour Plasma**.—Klarfeld: Engel & Steenbeck, **1191**.
- Representation of Planar Motion of Electrons in Magnetic and Electric Fields by Complex Vector Loc.**—Kleinwächter, **4649**.
- Measurements of Variation in Mass of Very Rapidly Moving Electrons**.—Lahave, **1132**.
- Relativistic Electron in Crossed Fields**.—Ott, **1131**.
- Mechanical Model for Electron Motion in Uniform Magnetic Field**.—Rose, **4100**.
- Electrons**: see also Charged-Particles, Crystals, Deflecting, Detection, Equations-of-Motion, Ferromagnetism, Secondary, and below.
- Oscillation Production by an Electron Beam in Field of Plate Condenser, with Consideration of Effect of the Stray Fields**.—Hollmann & Thoma, **276**.
- Electron Distribution in Electron-Optically Focused Electron Beams**.—Jacob, **3710**.
- Electron Bombardment of Biological Materials: Electron Tube for Production of Homogeneous Beams of Cathode Rays from One to Fifteen Kilovolts**.—Cooper, Buchwald, & others, **2494**.
- Effect of Electron Bombardment on Electrical Conductivity of Zinc Blende Crystals, and Dielectric Anomalies of Zinc Blende Crystals**.—Distad, **4110**.
- Decay of Phosphorescence after Electron Bombardment**.—Nelson & Johnson, **2938**.
- Effects produced by Electron-Bombardment of Metallic Surface by High-Velocity Electrons**.—Trillat & Merigoux, **3711**.
- Electron Conductivity in Strong Fields**.—Wolkenstein, **3764**.
- Electron Diffraction Study of Copper Oxides**.—Dunholter & Kersten, **4132**.
- Electron Diffraction Studies of Very Thin Films**.—Germer, **4112**.
- New Apparatus for Demonstration of Electron Diffraction**.—Trillat, **2081**.
- Spontaneous Electron Emission occurring at Electrodes as After-Effect of Gaseous Discharges, and Field Electron Emission at Thin Insulating Films**.—Paetow, **2538**.
- Fixed-Focus Electron Gun for Cathode-Ray Tubes**.—Iams, **2063**.

Subsidiary Apparatus and Materials—

- Calculation by Successive Approximations of Electrostatic Field of a Cylindrical System [e.g. **Electron Lens**].—Boni, 3707.
- Search-Coil Oscillator for measuring Fields of Magnetic **Electron Lenses**.—Klemperer & Miller, 2927.
- Investigation of **Electron Lenses**.—Klemperer & Wright, 2433.
- Field Measurements and Possible Correction of Aberrations for Magnetic **Electron Lenses**.—Martin, 2926.
- Analytical Study of Electrostatic **Electron Lenses**.—Sugata, 1125 & 2072.
- Electron Lenses**: see also Aperture-Error, Lens.
- Electron-Microscope**.—von Ardenne, 710 (Image Errors by Scattering in Object), 712 (Raster M.), 1687 (ditto); 4105 3 (ditto, Chromatic Error; ditto, & Elec. Shadow Microscope; Intensity & Resolving Power of Magnetic E.M.; Possibility of Examining Living Substances); Beischer: Ruska, Krause, 709 (Remarks on Papers); Boersch, 3716 (Shadow M., a New Electron Super-Microscope); von Borries & Ruska, 1686 (Image Formation in Super-M.); Brüche, 2076 (Principles); Gallarati, 2925 (Study of Emission from Cathode Pastes); Hillier, 3719 (Chromatic Error); Johnson, 286 (Simple E.M.s.); Martin, 1123 (Survey: Possibilities & Problems); Mahl, 2076 (E.M. & Its Applications); Pampana, 2924 (E.M. & Microbiology); Prebus & Hillier, 3718 (E.M. of High Resolving Power); Triau, 2073 (Latest Developments & Technique); Surveys, 1124, 2079 & 2923.
- Electron Microscope**: see also Camera, Electron Scanners, Electron-Telescope, Field-Emission, Photography, Super-Microscope, Tungsten.
- Electron Multiplier**: see Detection, Electron-Paths.
- Electron Optics** [Book Review].—Klemperer, 2922.
- Electron Optics**: Theoretical and Practical [Book Review].—Myers, 2075.
- Aberration of Geometrical **Electron-Optics** of Fifth Order.—Inoue, 4650.
- Electron Optics**.—Brüche, Mahl, 2076 (Applied E.O.); Cotte, 1126 (Theoretical Treatment) & 2921 (Aberrations, by Relativistic Approximations); Gray, 2073 (Electrostatic E.O.); Herzog, 4009 (Theory of Plane Ideal Condenser); Jacob, 287 (Field Distribution & Graphical Ray Tracing) & 1127 (Equation to Axial Potential Distribution); Katz, 1133 (E.O. Experiments on Slow-Electron Passage through Foils); Mahl, 2076 (Applied E.O.); Rauberg, 2074 (Simplified Derivation of General Properties of E.O. Image); R. & Morton, 4102 (E.O., General Account: Determination of Refractive Fields, etc.).
- Electron Optics**: see also Focusing, Optics, Optique, Phase-Focusing, Spectrometer, Spectrum Analysis.
- Some Methods of studying **Electron Paths** in Design of Valves and Electron Multipliers.—Gallarati & Madia, 2930.
- Electron Scanners** for producing Images of Structure of Surfaces and Thin Films.—Knoll & Theile, 4111.
- Electron Scattering** and Plasma Oscillations.—Merrill & Webb, 3773.
- Impedance Properties of **Electron Streams**.—Peterson, 4648.
- Electron Supply**: see Counter-Discharge.
- Siemens-Ruska Electron Microscope, Lallemand **Electron Telescope**, and Henroteau Electron Spectrograph, 2923.
- Electron Temperature** T_e in a Positive Column Discharge with Alternating Current.—Lyterhoeven & Verburg, 1190.
- Variation of Focal Distance in an **Electron X-Ray Tube**, and Seuring of Regular Distribution of Electrons.—Solovjev, 2498.
- Electronic Waves** [Effects produced by Collisions between Cathode Rays and Matter].—Thomson, 1181.
- Self-Exciting **Electrostatic Generator** with Charging Bands running in Compressed Gas.—Neubert, 1140.
- Emission**: see Arcs, Battery, Cathodes, Electrons, Field-Emission and under "Valves & Thermionics."
- New Form of **Electromagnetic Energy Equation** when Free Charge, Particles are Present.—Tonks, 718.
- Movement of Electrified Particle in Electric Field with Superposed Magnetic Field [Integral of Equation of Motion].—Boggio, 1130.
- Integration of Equations of Motion of Electrified Particle of Variable Mass, subjected to Action of Any Electric and Magnetic Fields Whatever.—Opatowski, 2083.
- Modern Fasteners in Radio Industry.—Walsh, 3787.
- Ferromagnetism**.—Ashworth, 2546 (Book-Review); Becker, 1719 (F. at H.F. Fields); Bittel & Gerlach, 1260 (F. & Elec. Properties: Curie Point & Elec. Resistance of Nickel); 1254 (Generalisation of Theory of F.); de Boer & Michels, 1258 (F. Curie Point as Phase Transition of Second Kind); Brown, 1256 (Domain Theory of F. under Stress: Reversible Susceptibility) & 2935 (Theory of Reversible Magnetisation); Döring, 1255 (Temperature Variation of Elasticity Modulus); Forrer, 307 (F. Products from Fe(OH)), 1272 (Activation & Composition of Elementary Moment in F. Alloys), 1274 & 4206 (Decomposition of Elementary Moment & Gyromagnetic Phenomena); Grabovskij, 2545 (Determination of Saturation Magnetisation of F. Plates); Kennard, 2547 (Shape of Domains); Kersten, 3783 (Physical Significance of Magnetising Processes); Kussmann, 3353 (Research on F. Materials); Parodi, 2130 & 3784 (Phenomena of Wave Propagation); Schlechtweg, 4727 (Influence of Mechanical Tension); Stoner, 784 & 2548 (Collective Electron F.); Vonsovskij, Shur, 2551 (Theory of Magnetisation Curve: Hysteresis Anisotropy of Monocrystals).
- Ferromagnetism**: see also Antiferromagnetism, Chromium, Coils, Colloids, Heat-Treatment, Iron, Magnetic, Mechanical-Treatment, Metamagnetism, Nickel, Paramagnetic, Semiconductor, Surface-Treatment, Tension.
- Surface Structures of Possibly Atomic Dimensions using Autoelectronic or **Field Emission** from Fine Metal Points.—Benjamin & Jenkins, 2508.
- Energy Distribution in **Field Emission**.—Henderson & Dahlstrom, 2948.
- Discussion on "Study of Problem of Magnetic Filings in Suspension: Contribution to Theory of Magnetism and Hysteresis."—Guilbert, 3347.
- Portable Motor-Driven Apparatus for Depositing Built-Up Molecular Films.—Gregg & Widdowson: Blodgett, 4687.
- Relation between Transmission of Light and Conduction of Electricity in Thin Films.—Saito, 4668.
- Films**.—Baumann, 2537 (Aluminium-Oxide Fs.); Bristow, 2535 (Conductivity of Thallium Fs.); Colombani, 2536 (Thin Nickel Fs.); Essig, 2096 (Silver Fs. on Mica Crystal Face); Fukuroi, 2955 (Transformation Temperature of Metallic F.); Germer, 2956 (Arrangement of Atoms & Molecules in Extremely Thin Fs.); G. & Storks, 3749 (Rubbed Fs. of Barium Stearate & Stearic Acid); Hessler & Savage, 4214 (Collector-Ring Fs.); Koller, 297 (Reflection & Transparency of Thin Metallic Fs.); K. & Kindinger, 1155 (Gas Absorption & Anomaly of Optical Constants); Krautkrämer, 1154 (Optical Constants, Elec. Resistance, & Structure of Gold & Silver Fs.); Leberknight & Lustman, 2097 (Oxide Fs. on Metals); Perucca, 3776 (Conductance of Thin Metallic Fs.); Race, 2971 & 3750 (Insulating Properties of Monomolecular Fs.); Rouard, 2533 (Very Thin Platinum Fs.); Sabine, 4218 (Reflectivities of Evaporated Fs.); Sookne & Weber, 787 (Ozaphane F. as Recording Material); Was, 2534 (Conductivity, Light Transmission, & Structure of Thin Gold Fs.).
- Films**: see also Electron-Diffraction, Electrons.
- Devices for **Filtering** of Alternating Currents of Any Wave Form.—Giulietti, 2555.
- Fire-Fly "Spintharoscope"**.—Wood, 4663.
- Fluorescence** of Aqueous Solutions of Terbium.—Seidel & others, 4662.
- Fluorescence (t)**.—Almy, Winans, & others, 2503 (F. & Absorption of Diacetyl of Mercury-Thallium Mixture); Beese, 3727 (Response to Short Ultra-Violet); Boutaric & Roy, 4129 (Uranine Solutions); Bowen, 1151 (F. of Solids: Electron Motion in Crystals); Chatterjee, 4127 (Artificial Fluorites); Eckstein, 3730 (Bivalent Samarium); Fouda, 722 (Fundamental Principles); Gilsol & de Groot, 1673 (F. & Phosphorescence); Golbreich, 2088 (Microstructural Screens, and Lustrous Silver Layer for Photocathode); Haberlandt & Köhler, 4128 (Silicates, & Fluxes containing Europium); Hirschlaif, 3731 (Book-Review); Krause, 2502 (Sensitised F. of Potassium); Le Grand, 1152 (F. of Crystal Line Lens); Meixner, 4126 (Uranium Minerals); Randall, 2092 & 2499 (Compounds containing Manganese); Winans, Lyman, 3737 (Sensitised F. of Lead: Sensitised F.).
- Fluorescence (t)**: see also Interference-Experiment, Phosphors, Polyelectrolysiograph, Screen, Super-Microscopy, Willemite.
- Focusing** of Electrons possessing High Velocities, and General Properties of Centred Systems in Relativistic Mechanics.—Cotte, 3708.
- Focusing Properties** of Electrostatic Field between Two Cylinders.—Nicol, 1129.
- Focusing**: see also Charged-Particles.
- Influence of Electric Field on Internal Friction of Liquids.—Menz, 3333.
- Telephone Alarm Fuses.—Hardy, 1700.
- New Fuse Phenomenon [Importance of "M" Effect].—Metcal, 2954.
- Characteristics of Tungsten Fuses.—Utiyama & Arai, 2567.
- Fuses**: see also Wires.
- Generators**: see Current, Droplets, Electrometer, Electrostatic, High-Tension, -Voltage, Impulse, Ion-Convection, Potential-Source, Wind-Driven.
- Investigation into **Gettering** Powers of Various Metals.—Ehrke & Slack, 2950.
- "**Getterstoffe** und ihre Anwendung in der Hochvakuumtechnik" [Book Review].—Littmann, 1679.
- Insulating Material of Glass Flux and Mica Dust, 4699.
- Fibre Glass—an Inorganic Insulation.—Atkinson, 3761.
- New Type of Glass.—Corning, 3760.
- Fibrous Glass for Electrical Insulation.—Ferris & Moses, 755.
- Electric Strength of Fibrous Glass.—Gemant & Glassow, 4149.
- Drilling Small Holes in Glass.—Heatley, 1213.
- Sources of Error in High-Frequency Measurements of Dielectric Properties of Glass.—Hudson, 756.
- Low-Temperature Dielectric Losses in Glass containing Metallic Ions.—Lysenko, 2524.
- Asbestos and Glass-Fibre Magnet-Wire Insulation.—Mathes & Stewart, 3762.

Subsidiary Apparatus and Materials—

- Fibre Glass as Electrical Insulator.—de Piolenc, 2117.
Strength Investigations on "Organic Glasses."—Rexer, 2523.
Glass: see also Breakdown, Quartz-Glass, Textiles.
"Die Glimmröhre in der Technik" [Practical Applications of Glow-Discharge Tube: Book Review].—Nentwig, 4189.
Luminescent Zones in Front of Glow-Discharge Cathodes.—Sporn, 4183.
Glow Discharge.—Boucke, 3768 (New Stabilising Circuits with G.D. Lamps); Drayvestevn, 1179 (Abnormal Cathode Fall); Fan, 4170 (Transition to Arc); Güntherschulze, Bär, & Winter, 1180 (Electron Liberation by Positive Ions); Holtz & Müller, 2509 (Combination of Nitrogen & Oxygen); Kaiser & Wallraff, 4171 (Transition between Arc & G.D. in Series of Sparks); Maxfield & others, 2968 (Cause for Glow/Arc Transition); Mochizuki & Iwamoto, 2070 (Dynamic Characteristics of G.D., Saw-Tooth Neon Lamp); Parfentev, 3770 (with Cold Cathode & Control Grid); Rudolph, 2510 (Temperature Measurements); Scherzer, 3306 (Theory); Schwabek & Weillbach, 1209 (G.D. Lamp Relay Meter); Wolf, 2967 (Spray Discharge from Badly Conducting Films on Heated Glass, formed in G.D.), & 4172 (G.D. at Semiconductor Electrodes). See also Discharge, Negative-Ions.
Gold: see Alloys.
Heat Conduction in High Pressure Column.—Romppe & Schulz, 4174.
Influence of **Heat Treatment** in Magnetic Field upon Ferromagnetic Monocrystal.—Shur, Jaanus, 1721 & 2981.
High-Speed Mechanical Recorder.—Neher, 1897.
High-Speed Cinematography.—Palmer, 1678.
High-Speed Motion-Picture Photography.—Herriott, 1211.
On Special Solution of Stability Problems in **High-Speed Rotors.**—Kapitza, 4215.
Stabilisation of Variable **High-Voltage D.C.**—Hackett, 4715.
Portable **High Voltage Supply.**—Huntton, 3772.
Generators for Very High D.C. Voltages, and Production of High Energy Particles.—Klein, Wells, 2485.
Theory and Realisation of Continuous Generators of Very **High Voltage** employing a Dust Current.—Morand & Raskin, 4118.
Production of **High Tensions** by Currents of Electrified Particles.—Pauthier, 3725 & 4117.
High-Voltage High-Frequency Phenomena.—Pickles, 2123.
Axial Field in Supporting Tube of Collector of **High-Voltage** Generator, utilising an Electrified Aerosol.—Virgitti, 1141.
High-Tension, -Voltage: see also Acceleration (-or), Atom-Smasher, Cyclotron, Droplets, Electrometer, Electrostatic, Impulse, Ion-Convection, Potential-Source, Regulating, Smoothing, Voltage.
Effect of **Humidity** of Air on Critical Temperature of Porcelain Insulators.—Alessandri, 4706.
Effect of **Humidity** on Impulse Flash-over Voltages of Rod Gaps and Insulators.—Ishiguro, 4707.
Humidity Effect on Dielectric Loss Angles at H.F.—Okazaki & Itojo, 4708.
Impulse Voltage Installations.—Boldingh, 1693.
Impulse-Generating Apparatus.—Hertwig, 294.
Impulse Testing using Oscilloscope Equipment.—Sizzen, 4654.
Dielectric Constants and Power Factors of Some **Insulating Materials** at Ultra-High Frequencies.—Miller & Salzberg, 3321.
Insulating, Insulation, etc.—Alexandrov, 792 (Conference); Ehrenberg, 2945 (I. Joints for Vacuum Tubes); Frenkel, 770 & 1711 (Pre-Breakdown Phenomena in Is. & Semiconductor); Firkert, 1713 (Fetticoat Is. under Mechanical Stress); Génin, 2113 (Congress on Plastics); Hartshorn, 763 (No Mica in Calan); Müller, 310 (Physics of Organic I.); Nat. Research Council, 2120 (Conference); Nerz, 1230 (Creep-Path); Taylor, 4154 (Sorption of Water by Organic Is.); V.D.E., 1227 & 3755 (Specifications & Report); Walter, 1226 (Production in U.S.S.R. and U.S.A.); Whitehead, 2121 (Progress in Research).
Insulating (-ion): see also Absorption, Alsilfin, Ambroid, Amorphons, Breakdown, Cellulose, Ceramic, Conducting-Particles, Dielectric, Dielectric-Constant, Electrolytes, Glass, Humidity, Isolier-, Isotropic, Loss, Low, Mica, Paper, Paraffin-Wax, Plastics, Polymerisation, Polystyrols, Porcelain, Pryanol, Pyrophillite, Quartz, Refractory, Relaxation, Resins, Rubber, Steatite, Stoffsichtigkeit, Surge, Temperature, Textiles, Thermal, Titanium, Tritulit, Water.
Interchange of Electricity between Solids, Liquids, and Gases in Mechanical Actions.—Banerji, 3738.
Theoretical Evaluation of Wide-Angle **Interference Experiment.**—Doermann & Halpern, 2940.
Inversion Spectrograph: see Spectrum-Analysis.
New Inverting Method using Mechanical Commutator and Grid-Controlled Mercury-Arc Rectifier.—Watanabe & Outi, 4680.
Emission of **Negative Ions** from Oxide Cathodes.—Broadway & Pearce, 2492.
Formation of **Negative Ions** by Negative-Ion Bombardment of Surfaces: New Process.—Sloane & Cathcart, 2493.
Ions: see also Detection, Electrons, Magnatron, Negative, and below.
Conditions for producing Intense **Ionic Beams, and Focused Beam** Source of Hydrogen and Helium Ions.—Smith, Scott, 3302.
Ion-Convection Generators.—Tscheschnerin & Babat, 733.
New Type of Low-Voltage, High-Current **Ion Tube** for Production of Neutrons.—Crane & Oleson, 3724.
Expression of Anode Voltages and Currents taken from Mains by **Ionic Valve.**—Kouskoff, 4178.
Iron.—Chaudron & Michel, 1728 (Thermomagnetic Characteristics of Cubic Iron Sesquioxide); Florescu, 3346 (Axial Permeability of Wires & Thin Films at High Frequencies); Glatthart, 3344 (Permeability of Iron & Nickel at Ultra-High Frequencies); de Haas & Schultz, 3354 (Mag. Properties of Salts at Low Temperatures); Hardy & Quimby, 1257 (Change of Thermal Energy in Iron, Nickel, & Carbon Steel); Heaps, 1279 (Mag. Viscosity); Hoag & Gottlieb, 2982 (Initial Permeability of I. & Nickel at Ultra-High Frequencies); Honda & Hirone, 2549 (Mag. Anisotropy of I., Nickel, & Cobalt); Kaufmann, Bitter, Grabbe, McKeehan, Constant, Formwalt, Nier, 2984 & 4199 (Miscellaneous Papers); Ledward, 1723 (Polarisation Phenomena, especially in Ni-Fe Alloys); Leech & Svkes, 3352 (Superlattice in Nickel-Iron Alloy); Lindman, 3345 (Permeability of I. & Nickel at Ultra-High Frequencies); Mallory, 2127 (Powder Cores for Power Oscillators); Mash & Enshukov, 2542 (Permeability of I. in High & Ultra-High-Frequency Fields); Procopiu, 2979 (Thickness of Thinnest Film at which Mag. Discontinuities disappear); Sucksmith, 3351 & 4200 (Iron-Nickel-Aluminium System); Telesnin, 3350 (Rate of Variation of Magnetisation through Hysteresis Loop); Wall, 775 (Mag. Quality of I. Wire as influenced by Diameter); Williams & Bozorth, 2983 (Anisotropy of I.-Nickel & Copper-Nickel Alloys). See also After-Effect, Alloy, Anomalous, Brass, Ferromagnetism, Magnetite, Permanent, Permeability, Platinum, Silicon, Superstructure, Ternary.
"Elektrische Isolierstoffe" [Book Review].—Boning, 1710.
Electrostatic Action in System of **Isotropic Bodies.**—Roy, 769 & 1236.
Production of H.F. "Kipp" Oscillations with Gaseous-Discharge Tubes.—Pieplow, 293.
Industrial Production and Utilisation of **Krypton**, 4674.
Krypton: see also Rare-Gases.
Use of Latex Dry Adhesive for **Kymograph Paper.**—Pratt, 4220.
Simple Xenon Lamp for Short-Wave Ultra-Violet.—von Ardenne, 1153.
Technical Applications of Modern Electric Discharge Lamps.—Harris, 3767.
Properties of Mercury High-Pressure Lamps with Several Discharge Arcs.—Kern & Kreffit, 1746.
Mercury Vapour Lamps of High Light Density.—Romppe & Thouret, 1745.
Radiation Measurements on High-Pressure Mercury Lamp.—Rössler, 1173.
New Electric Incandescent Lamp.—Skaupy, 1741.
Lamps: see also Light, Luminous, Resistances.
Spherical Aberration of Magnetic Lenses.—Becker & Wallraff, 284.
Crystalline Type of **Light-Counter**, and New Sensitive **Light-Counter.**—von Hippel, Tschaschel, 738.
Present Position of **Light Production.**—Kreffit, 1743.
Light Sources: see also Lamps, Luminous, Spark.
Liquids: see Loss, Solidification.
Loss Measurements on Dipole Liquids and Solid Commercial Insulating Materials on Centimetric Waves.—Baz, 3751.
Thermal Method of measuring **Losses** in Sheet Dielectrics at Radio Frequencies and High Electrical Stresses.—MacGregor-Morris & Grisdale, 3752.
Physics of Dielectric Losses.—Schupp, 767.
Losses: see also Glass, Humidity, Insulating, Paraffin-Wax.
Low-Loss: see Paraffin-Wax.
Simple Arrangement for Measuring Charging Potential of Films of **Luminescent Materials** irradiated by Electrons.—Frierichs & Krautz, 2931.
Luminescence(t).—Beese, 1670 (Activation & Decay of Zinc Silicate); Claude, 1174 (L. Discharge Tubes on Mains Voltages); Destriau, 2500 & 3297 (Effect of Elec. Field on Emission in Electrophotoluminescence) & 3733 (L. in Elec. Fields and Electronic Phenomena in Semiconductors); Dunoyer, Lainé & Servant, 1175 & 1744 (Emission at End of L. Gas Tubes); Ewles, 2090 (Recent Views: Faraday Society); Fabrikant & others, 4182 (L. Probe in Gaseous Discharge); Frierichs, 289 (Physics & Applications of L. Materials in Optical Technique); Gisolf, 1150 (L. Zinc Sulphide & Zinc-Cadmium Sulphide); de Groot, 2089 (L. Decay & Related Phenomena); Grotheer, 4122 (Fatigue); Gurwitsch, 3736 (Ultra-Violet Chemi-Luminescence); Johnson & Davis, 3732 (L. during Intermittent Optical Excitation); Kröger, 2501 (L. & Absorption of ZnS-MnS Mixed Crystals); Levenenz & Seitz, 4124 (L. Materials); Martin & Headrick, 2933 (Light Output & Secondary Emission); Nelson & others, 2936 (during Intermittent Electron Bombardment); Randall, Wilkins, 290 & 3734 (L. & Photoconductivity); Riehl, 2934 (New Effect in Zinc Sulphide excited by Ultra-Violet); Servigne, 3735 (Applications of Some Results—Production of White Light, Detection of Rare Elements); Zworykin, 2091 (Spectroradiometer for Cathodoluminescent Materials).
Luminescent: see also Fire-Fly, Glow-Discharge, Luminous Phosphor-, Radiation-Transformation, Spectrum, Willemite.

Subsidiary Apparatus and Materials—

- Technical Production of Light by Means of **Luminous Materials**.—Rüttenauer, 1742.
- Investigations on **Magne-Crystallic Action**.—Krishnan, Mookherji, & Bose, 1268 & 3357.
- Long-Throw **Magnet**.—Dollmann, 1247.
- Magnet**: see also **Alnico**, **Electro**, **Permanent**, **Spherical**.
- Magnetic Susceptibilities in Weak Fields**.—Hector & Peck, 2977.
- Limiting Sensitivity of A.C. Method of measuring Small **Magnetic Moments**.—Johnson, 1277.
- Experiments on Reversible and Irreversible Partition Displacements between Anti-Parallel **Magnetised Weiss Domains**.—Kersten, 1722.
- Determination of **Magnetic Properties in Different Parts of Very Large Objects**.—Khalileev, 4212.
- Magnetic Resistance Variation of Pure Metals**.—Kohler, 1278.
- Magnetic Anisotropy of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$, in Relation to Its Crystal Structures**.—Krishnan & Mookherji, 1269.
- Survey of **Magnetic Materials and Applications in Telephone System**.—Legg, 4723.
- Development of **Magnetic Materials**.—Morgan, 4208.
- Measurement of **Magnetic Saturation Intensities at Different Temperatures**.—Sucksmith, 2552 & 3349.
- Magnetic Field**: see **Collector-Currents**, **Equation-of-Motion**, **Spherical**, **Stabiliser**.
- Magnetically-Controlled**: see **Permatron**.
- "Probleme der technischen **Magnetisierungskurve**" [Göttingen Conference: Book Review].—Becker & others, 1252.
- Nuclei and Propagation of **Magnetisation Changes for Large Barkhausen Discontinuities**.—Haake, 4202.
- Possibility of Analytical Representation of **Magnetisation Curve** by means of Empirical Formulae.—Irdi, 1251.
- Theory of Ideal **Magnetisation Curve**.—Sauter, 1250.
- Mechanism of **Magnetisation**.—Wall, 2540.
- "**Magnetism**. Physics in Industry: Lectures" [Book Review], 1253.
- Modern Views on **Magnetism**, 4210.
- "Modern **Magnetism**" [Book Review].—Bates, 4211.
- Magnetic Magnetism**: see also **Alloys**, **Anisotropies**, **Anomalous**, **Barkhausen**, **Bismuth**, **Brass**, **Copper**, **Crystals**, **Curie-Point**, **Ferromagnetic**, **Filings**, **Heat-Treatment**, **Iron**, **Magne-Crystallic**, **Magnetite**, **Manganese**, **Mass-Spectrometer**, **Neodymium**, **Nickel**, **Permeability**, **Platinum**, **Rectification**, **Relaxation**, **Shields**, **Steel**, **Superconductors**, **Surface-Treatment**, **Tension**, **Viscosity**, **Water**, and below.
- Iron Crystal Orientation in **Magnetite** reduced by Hydrogen.—Buynov & others, 2978.
- H.F. Core of **Magnetite**.—Evseev, 779.
- Study of Oxidation of **Magnetite**: Variation of Velocity of Oxidation at Curie Point.—Lille, 4209.
- Theory of Magnetically Neutral Solutions: New Possibility of Determining Number of **Magnetons**.—von Auwers, 1281.
- Magnetoresistance**: see **Nickel**.
- Theory of Ion Current in **Magnetron** as applied to Source of Ions.—Sitnikov, 2085 & 3303.
- Production of Large Ionic Currents in Gaseous Discharge **Magnetrons**.—Viglorchik, 2084.
- Manganese**: see **Chromium**, **Manganiferites**.
- Magnetic and Electric Behaviour of Manganiferites**.—Schulze, 1729.
- Simple Glass-Membrane **Manometer** for Low Pressures.—Grigorovici, 2506.
- MacLeod **Manometer** with Oil Filling.—Kosljakovskaja, 2507.
- Simple Model of Knudsen **Manometer**.—Werner, 1143.
- General Theory of Double-Focusing **Mass Spectrograph**.—Herzog & Hauk, 1134.
- Optics of Positive Rays and Application to **Mass Spectrography**, and **Mass Spectrographs**.—Cartan, 1135 & 2077.
- Spherical Coil for **Mass Spectrometer**.—Hipple, 2928.
- Design of Accurate **McLeod Gauge**.—Rosenberg, 4120.
- Influence of **Mechanical Treatment** on Characteristics of Sheets of Ferromagnetic Materials.—Chiodi, 1249.
- Memory**: see **Oscilloscope**.
- Rate of Vaporisation of **Mercury** from Anchored Cathode Spot.—Tonks, 732.
- New Form of Band Igniter for **Mercury Pool Tubes**.—Germeshansen, 2518.
- Indicators for Arc-Back in **Mercury-Vapour Rectifiers**.—Logan, 4678.
- New Method of Extinguishing a **Mercury-Vapour Arc**.—Watanabe & Kasahara, 2517.
- Mercury Vapour**: see also **Breakdown**, **Rectifier**.
- "Protective Coatings for Metals" [Book Review].—Burns & Schuh, 4730.
- Adherence of Organic Coatings to **Metals**.—Schuh, 3339.
- "**Metamagnetism**" [New Aspect of Ferromagnetism or Completely Separate Effect].—Becquerel & van den Handel, 1739.
- Thin **Mica Windows**.—Arnold & others, 3720.
- Influence of Medium and of Adsorbing Substances on Mechanical Properties of **Mica**.—Logginov, 2525.
- Temperature Limits and Characteristics of **Mica**.—Spry, 3754.
- Mica**: see also **Condensers**, **Glass**.
- Micro-Waves**: see **Absorption**, **Crystal**, **Dielectrics**, **Dielectric-Constant**, **Loss**.
- Measurement of Reflective Power of Metallic **Mirrors**.—Burger & van Milaan, 4219.
- Moisture**: see **Humidity**, **Paper**.
- Molybdenum**: see **Barium**, **Prings**.
- Light-Weight Induction **Motor**.—Ohsumi, 4721.
- "A.C. **Motors of Fractional Horse Power**" [Book Review].—Jones, 744.
- Midget Petrol **Motors** by Mass Production.—Pope, 4722.
- Insensitive **Needle Valve**.—Stallmann & Kruger, 4671.
- "**Negative Ions**" [Book Review].—Massey, 734.
- Principal **Magnetic Susceptibilities of Neodymium Sulphate Octahydrate at Low Temperatures**.—Jackson, 1282.
- Neon-Controlled Stabiliser**.—Riddle & Downes, 1203.
- Neon Stabiliser**.—Thomas, 1202.
- Ignition Potential in Low Pressure **Neon Tube**.—Fett, 1177.
- Nickel** and Alloys in Electrical Industry.—Bailey, 1261.
- Magnetic Nickel Alloys**: Uses in Radio Equipment.—Everest, 2541.
- Magnetoresistance of **Nickel** in Large Fields.—Heaps, 4201.
- Magnetic Permeability of Nickel** for Hertzian Oscillations.—Lindman, 306.
- Magnetic Susceptibility of Nickel Chloride**.—Nettleton & Sugden, 4203.
- Change of **Magnetic Properties of Single Crystal of Nickel** due to Temperature.—Okamura & Hirone, 1720.
- Nickel**: see also **Alloys**, **Ferromagnetism**, **Iron**, **Permanent**, **Permeability**, **Superstructure**, **Ternary**.
- Experiment in Use of Hot Pressing of **Non-Ferrous Metals** for Electrical Industry.—Perlin, 4221.
- Electrical Breakdown of **Oil**.—Böning, 1705.
- Properties of **Whale Oil** as Insulating Varnish.—Shimizu & Inai, 4712.
- Reconditioning of Insulating **Oils** by Activated Alumina.—Housley, 4159.
- Oils**: see also **Polymerisation**.
- Optical Levers** [for Oscillographs, Galvanometers, etc.].—Mathews, 3298.
- Optics** of Electrical Charges.—Bricout, 717.
- "Recherches sur l'Optique électronique" [Book Review].—Cotte, 716.
- Organic Glasses**: see **Glasses**.
- Timer for Use with Westinghouse Four-Unit Moving-Coil **Oscillograph**.—Sontag & Huff, 720.
- Oscillograph**: see also **Amplifier**, **Cathode-Ray**, and below.
- Oscillograpturbograph** [for Short-Time Phenomena on Distribution Systems].—Masson, 719.
- Oscilloscope** for Determination of Characteristic Curves.—Douna & Zijlstra, 4646.
- Memory Attachment for **Oscilloscopes**.—Pakala, 723.
- Oxygen Films**: see **Tungsten**.
- Adsorption of **Water** by **Papers** at Elevated Temperatures.—Houtz & McLean, 3326.
- Influence of **Moisture** upon D.C. Conductivity of Impregnated **Paper**.—McLean & Kohman, 309.
- Tests on Oil-Impregnated **Paper**.—Race, 765.
- On Electrical Conductivity of **Paper** and **Cellulose**.—Shorygin, 2527.
- Dependence on Temperature of Electric Currents in **Paraffin**.—Scislovski, 3322.
- Dielectric Loss due to Polar Molecules in Solid **Paraffin Wax**.—Pelmore, 3323.
- Behaviour of Polar Molecules in Solid **Paraffin Wax**.—Sillars, 1233.
- Paramagnetic Relaxation**.—Delve, 1283.
- Theory of **Paramagnetic Relaxation**, and Theory of Ferromagnetism.—van Vleck: Weiss & van Vleck, 2986.
- Particles**: see **Conducting**, **Equations**.
- Powder Patterns on **Permalloy Crystals**.—Shih & Chai, 4207.
- Some Fundamental Factors in Design of **Permanent Magnets**, 780.
- What Figures determine "Merit" of **Permanent Magnets**?—Breitling, 1735.
- Permanent-Magnet Alloys** of Cobalt, Copper, and Nickel.—Dannöhl & Neumann, 1734.
- Current-Surge Transformers for Magnetisation of **Permanent Magnets**, and Magnetising by Condenser Discharge.—Redepenning: Dietz, 1246.
- Permanent Magnets**: see also **Anisotropies**.
- Permatron**—Magnetically Controlled Industrial Tube.—Overbeck, Raytheon, 2962 & 3769.
- Measuring **Permeability** under Stress.—Goertz, 1731.
- Permeability of Magnetic Metals** in Region of High [and Ultra-High]-Frequencies.—Nighring, 4198.
- Drift of **Permeability** at Low Inductions after Demagnetisation.—Patterson, 1267.
- Variation in Longitudinal Incremental **Permeability** due to Superimposed Circular Field.—Webb, 1266.
- Experimental Proof of "**Phase Focusing**."—Mayer, 1657.
- Phase Shifters** for Grid-Controlled Discharge Tubes.—Kusakari, 4679.

Subsidiary Apparatus and Materials—

- Influence of Temperature on Extinction of **Phosphors**.—Antonov-Romanovsky, 1675.
- Phosphorescence** of Zinc Silicate **Phosphors**.—Fonda, 3726.
- Saturation Effects in Short-Duration Photoluminescence of Zinc Sulphide **Phosphors**.—de Groot, 2935.
- Characteristics of **Phosphors** for Cathode-Ray Tubes.—Headrick, 1671.
- Position occupied by Activator in Impurity-Activated **Phosphors**.—Jenkins, McKeag, & Rooksby, 3728.
- Decay of Willemite and Zinc Sulphide **Phosphors**.—Johnson, 3296.
- Zone Theory and Properties of Sulphide **Phosphors**.—Johnson, 4660.
- Phosphorescence**, Self-Extinction, and Sensitising Action of Organic Materials.—Kautsky & Merkel, 2937.
- Some Optical Properties of Zinc-Silicate **Phosphors**, and Fundamental Absorption of ZnS-MnS and ZnS-CdS-MnS Mixed Crystals.—Kröger, 4658.
- Investigation of **Phosphorescence** Mechanism of Samarium Phosphorescent Substances by Studying the Decay of Luminescence. Lewschin & Rickman, 2939.
- Electrical and Luminescent Properties of **Phosphors** under Electron Bombardment.—Nottingham, 1672.
- Variation of Light Output with Current Density, and Classification of Willemite **Phosphors**.—Ramberg & Morton, 2932.
- Investigations on Onset and Decay of Luminous Process in **Phosphors**.—Schleede & Bartels, 1669.
- Metastable Character of "Attachment Positions" in Crystal **Phosphors**.—Schön, 4125.
- Photoelectric Effect and Photoconductivity of **Phosphorescent** Sulphides and of Fluorides.—Voyatzakis, 3729.
- New Method of Measuring the Decay of **Phosphorescence** and Its Application to the ZnS-CdS-Cu **Phosphors** on Excitation with Electron Beams.—Wollweber, 1149.
- Phosphors**: see also Electron-Bombardment, Fluorescence, Luminescence, Radiation-Transformation, Willemite, Zinc-Sulphide.
- Sensitivity of **Photographic** Emulsions for Electrons.—Marton, 4665.
- Number of Quanta Required to Form **Photographic** Latent Image.—Webb, 4664.
- Cathode-Ray **Photography**: Permanent Records from Oscilloscopes and Television Screens.—Jupe, 4667.
- Cathode-Ray-Tube **Photography**.—Rogers & Robertson, 4666.
- Plasma**: see Collector-Currents, Electrons, Electron Scattering.
- Plastics**.—Phenol-Aniline Resins, 761; Injection applied to Thermo-Setting P., 2526; P. Compound from Sugar-Cane Bagasse, 4704; Paris Exhibits, 4150; Brandenburger, 1228 (Book Review); Burns & Werning, 4151 (Impact Testing); Fuoss, 2114 (Influence of Thermal History on Polyvinyl-Chloride P.); Goswami, 4705 (particularly India); Hartshorn & others, 760 & 3757 (P. & Elec. Insulation); Kausch, 4152 (Patent Survey; Book Review); McDonough, 1229 (Laminated P. for Radio); Phipps, 4702 (P. & Elec. Industry); Townsend & Clarke, 4703 (P. in Telephone Use); Yager, 1708 (Dielec. Constant & Loss as related to Composition). See also Resins.
- Effects of Iron with Metals of **Platinum** Group.—Fallot, 1273.
- Arrest of Certain Foreign Substances on Magnetic Properties of **Platinum**.—Théron, 3358.
- The **Polyelectrophysiograph**.—Huddleston & Whitehead, 288.
- Study of **Polymerisation** of Styrene in a 50 c/s Electric Field, and of oil in Electric Condensers.—Liechti, 1704.
- Polystyrene** [and Recent Improvements].—4692.
- Polystyrene** Film.—Bakelite, 4693.
- Polystyrene**: Electrical and Mechanical Characteristics.—Riddle, 4148.
- Polystyrol** as Insulator.—Pollock & Nichols, 759.
- Passage of Current through **Porcelain** at High Temperatures.—Schaudinn, 1223.
- Manufacture of Electrical **Porcelain**.—Whitney, 2118.
- Porcelain**: see also Breakdown, Insulation (Alexandrov).
- Dual-Range Potential Source for Field Use with Electroscopes and Counters.—Bosch, 739.
- Power Factor**: see also Condensers (4157).
- Power Supply** for Radio Receiver.—Beatt, 2102.
- Portable Transmitter **Power Supply**.—Dent, 4196.
- Power Supply**: see also Vibrator, Wind.
- Pregwood**: New Product, Lighter than Aluminium, for Various Mechanical and Electrical Purposes, 1701.
- Influence of Inductance and Spark Resistance of **Pulse** Discharge Circuit on Maximum Steepness of Voltage Rise.—Beindorf, 295.
- Pyranol Capacitors** for Television and Radio Transmitters, 754.
- Manufacture of Components from **Pyrophyllite** [Natural Aluminium Silicate].—Spiridonov & Perlin, 3758.
- Behaviour of Amorphous and Crystallised **Quartz** in Electrostatic Field.—von Altheim, 4141.
- Elastic Properties of Thin **Quartz** Threads.—Reinkober, 4217.
- Electrical Conduction in **Quartz**, Periclase, and Corundum at Low Field Strength.—Rochow, 1235.
- Temperature Dependence of Mechanical Strength of **Quartz** Glass.—Dawhl & Rix, 1222.
- Thyratron Counter for Measurement of **Radiation**.—Rymer, 2557.
- Physics of **Radiation** Transformation by Luminescent Materials.—Schön, 1674.
- Sensitivity Threshold of Gas Radiometer.—Wulfson, 2987.
- Striking-Voltage Curves for **Rare Gases** at Low Pressures.—Klemperer, 301. See also Krypton.
- Simple Logarithmic Recording Device.—Rogers & Willig, 3320.
- Recording**: see also Counting, Electrographic, High-Speed, Spark. Effect of Cooling and of Magnetic Fields on Crystal Rectification.—El Sherbini & Yousef, 2959.
- Rectifiers**.—Ajer, 3771 (Constant-Potential Battery-Charging Phanotrons); Böhm, 2558 (Smoothing for Low-Power Rs.); Dorsey, 1682 (Unusual Mercury R. operates at 100 kV); Fassler, 1158 (Current Harmonics on A.C. Side of Rs.); Kaestner, 3308 (Rs. with Hot Oxide-Coated Cathodes, and Dry-Plate Rs. in Transmitter Installations); Kluge, Germershausen, 3309 (Glass Mercury Rs. and AEG Low-Voltage Rs.); Ludwig, 1159 (Current/Voltage Characteristics of Capacitively Loaded Rs.); Okubo & others, 1163 (Ignitron applied to R. Circuit); Prinz, 3310 (Periodically Ignited Mercury-Pool R.); Thompson, 730 & 3307 (Recent Progress in Power Rs. & Applications); Trucksess, 1162 (Regulated Tube Rs. using Magnitude Control); Wagner, 1681 (Measurement of Wall Thickness).
- Rectifiers**: see also Cold-Cathode, Converter, Dry-Plate, Inverting, Ionic-Valve, Mercury-, Permatron, Phase, Sendytron, Transformers, Velocity-Modulation.
- Refractory** Materials.—Partridge, 2119.
- Automatic **Regulating** Transformer for Constant Voltage.—Beck, 3316.
- Thoma **Regulating** Transformer.—Gänger, 1205.
- Concerning Thermionic Regulation of Direct-Current Generators.—Danforth, 4194.
- Energy **Regulators** for Heating Circuits.—Sunvic Controls, Ltd., 1204.
- Regulators**: see also Bridge-Grid, Speed, Voltage.
- Relaxation** and Electrical Properties.—Falkenhagen, 1714.
- Influence of Molecular Form on Dielectric **Relaxation**.—Fischer, Miyamoto, Budo, 1237, 1717 & 3330.
- Dielectric **Relaxation** of Molecules with Freely Rotatable Dipole Groups.—Fischer & Frank, 3331.
- Theory of **Relaxation** Phenomena.—Kronig, 1715.
- Relaxation** connected with Transition from Superconductive into the Normal State.—van Laer & Groenewold, 3355.
- New Experiments on Structure, **Relaxation**, and Dispersion in Liquids.—Malsch, 1716.
- Experimental Contributions to Electrical **Relaxation** Phenomena.—Plötze, 1718.
- Relaxation**: see also Paramagnetic.
- New Hard-Valve **Relaxation** Oscillator.—Black, 4652.
- Relaxation-Oscillators**: see also Glow-Discharge, Kipp, Sweep-Circuit.
- Neon Tube as Shunt to Inductive Load in Relay Operation.—Beale: Clement, 2108.
- Relay** Contacts: Their Ailments.—Clement, 1698 & 3780.
- New Receiving **Relay** for Long-Distance Cable Telegraphy.—Estoup, 4189.
- Design of Polarised Telegraph **Relay**.—Jensen, 1210.
- Equivalent Circuit of Polarised **Relay**.—Livshits, 4190.
- Progress in Development of **Relays**.—Reche, 3781.
- Increasing Range of Tripping **Relays**, and Time Characteristics of the U-Type **Relay**.—Stacy: Swenson, 4188.
- Relays**: see also Cold-Cathode, Glow-Discharge, High-Speed, Spark-Quenching, Switch.
- Thermal and Electrical Properties of Coating of Synthetic Resins.—Shimizu & Inai, 4691.
- Resistances**.—Barber, 1699 (Rs. at Video Frequencies); Bressi, 4162 (High-Rs. at High Frequencies); Godfrey, 3340 (Gold-Chromium R. Wire); Linder, 4166 (Gas-Filled Lamps as Rs. for Power Measurements, etc.); Schulze, 3778 (Novokontakt); Vagonov, 4163 (Non-Wire Constant Rs.); Weise, 303 (Semi-conducting Rs.); Zenith, 3777 (Ceramide-Embedded Fixed Rs.); Zottu, 3343 (R. & Permeability Measurements at Ultra-High Frequencies).
- Resistances**: see also Carbon, Magnetic, Selenium.
- Discussion on "Method of **Rheographic** and **Rheometric** Analogies."—Péres & Malavard, 3299.
- Electrically Conducting **Rubber**, a New Material with Many Applications, 764.
- Tests with [Ozone-Proof] **Rubber** as Insulation for H.T. Lines and Cables.—Bormann, 1225.
- Note on Test Code of **Rubber**-Insulated Wires.—Kumagai & others, 4713.
- Rubber**: see also Amorphous, Electron-Paths.
- Photographic Production of Large Precision Scales and Graticules.—Burmistrov, 788.
- Development of Cathode-Ray Fluorescent Screen.—Schleede & Bartels, 4657.
- Electromagnetic Screens.—Latmirel, 2951.
- Electric Screening Effect of Grid.—Ikeda, 2095 & 4681.

Subsidiary Apparatus and Materials—

- Magnetic Screening** by Plane Metal Sheets at Audio Frequencies.—Moeller, 2539.
- Screening**: see also Eddy-Currents, Shields, Transformers.
- Measurements on Secondary Electrons** emitted from "Recoil Nets."—Sandhagen, 292.
- Possible Use of Selector Switch**.—Petrishev & Shupta, 749.
- Conversion of Vitreous and Monoclinic (a) Selenium to Hexagonal Modification**.—Das & Gupta, 2100.
- Effect of Hydrostatic Pressure on Resistance of Single Crystals of Selenium**.—Holmes & Allen, 2958.
- Some Industrial Applications of Selenium Rectifiers, and [Selenium] Rectifier Power Plant for Transmission Systems**.—Scruby & Giroz: Kelly, 4685.
- Selenium**: see also Dry-Plate, Zinc-Sulphide.
- Study of Semiconductors in Variable Régime**.—Déchéne, 3775.
- Electronic Conduction in Some Trivalent Rare-Earth Compounds [Semiconductors]**.—Ghosh, 1688.
- Behaviour of Semiconductors in H.F. Field**.—Henninger, 1687.
- Investigations of Electrical Conductivity and Thermoelectric Properties of Semiconductors**.—Hochberg & Somninski, 2564.
- Theory of Ferromagnetism of Semiconductor**.—Miyahara, 1730 & 4135.
- Reciprocal Action of Conduction Electrons and Interference Positions in Electronic Semiconductor: Voltage Effect, Frequency Effect**.—Müller, 771.
- Theory of Electronic Semiconductors**.—Nijboer, 4134.
- Semiconductor Theory of Barrier-Layer and Point Rectifiers**.—Schottky, 1685 & 4682.
- Semiconductors**: see also Barrier-Layer, Contact, Dry-Plate, Insulators (Frenkel), Luminescence (Destriau), Resistances, Thermovoltage.
- Sendytrom** using New Method of starting Mercury Arc.—Watanabe & Kasahara, 1164.
- Magnetic Shields, and Magnetic Shields for Transformers**.—Ellwood: Gustafson, 1244.
- Mumetal Magnetic Shields**.—Randall & Sower, 1243.
- Magnetic Structure of Electrolytically Polished Silicon-Iron Crystals**.—Elmore, 4726.
- Silver**: see Alloys.
- High-Voltage Smoothing [Valve Bridge Circuit]**, 2104.
- Time Delays due to Smoothing Circuits**.—Osteudorf, 296.
- Change in Dielectric Constant on Solidification of Homopolar Liquids**.—Guillien, 1239.
- Sovol**: see Insulators (Alexandrov).
- Performance of "Atmite" for Spark Quenching**.—Saville: Baker & Cannon, 3779.
- Note on Spark-Recording of Data**.—Tuttle, 4729.
- Sparks**.—Brinkmann, 2512 (Photoionisation by S.); Fucks & Bongartz, 4180 (Breakdown Change by Ultra-Violet); Fujitaka & Kobayasi, 2514 (Primary Ions of S. Discharge); Greinacher, Stuber, 1695 & 3319 (Spark-Counter); Ishiguro & Goshio, 1186 (Anomaly of A.C. Discharge); Jones, 3337 (S. Potential of Deuterium); Kaiser, 1694 (as Light Source for Spectral Analysis); Loeb, 4181 (Definition of S. Potential); Müller-Strobel, 4144 (Gliding Ss: Discharges along Dielectric Surfaces); Quinn, 2516 & 2969 (S. Potentials at Low Pressures); Raether, 300 (Ionising Radiation of S. Discharge) & 3334 (Development of Electron Avalanche); Snoddy & Beams, 2966 (S. Discharges on Surfaces); Toepfer, 1184 (Lowering of S. Voltage by Light Impulse) & 1185 (Calibration of S. Gaps between Spheres). See also Contact, High-Voltage, Pulse.
- Electron Lens Type of Beta-Ray Spectrometer, and Electron Spectrograph**.—Witcher & others: Harris, 4101.
- Measurement of Energy Distribution in Spectrum consisting of a Continuum and Lines**.—Rössler, 1176.
- Electron-Optical Spectrum Analysis of [Ultra-] High-Frequency Oscillations**.—Hollmann & Thoma, 713 & 3291.
- Speed**: see Stroboscopic, and below.
- Wide-Range Motor Speed Control**.—Schmitt, 1206.
- Speed Regulator for High Requirements**.—Huber & Meisterknecht, 2107.
- New Method for obtaining Uniform Magnetic Field [Spherical Magnet]**.—Clark, 1242.
- Improved Method of Spot Welding**.—Bayford, 2946.
- Zigzag and Helical Springs: Elastic Properties of Molybdenum**.—Tawney, 3301.
- Sputtering of Oxide-Covered Magnesium Surfaces**.—Ditchburn & Koulston: Güntherschulze & Betz, 1156.
- Cathode Sputtering**.—Starr, 4689.
- Automatic Stabiliser Circuit [for Magnetic Fields, etc.]**.—Rogers, 2556 & 4192.
- Compensation Circuit for Exact Voltage Constancy by Stabilising Tubes**.—Aulmann, 1201.
- Stabilising**: see also Constant-Current, High-Voltage, Neon, Sweep-Circuit, Voltage.
- Experiments with Steatite containing Added Metallic Oxides**.—Nakazi, 4147.
- Hysteresis Loss in Electrical Sheet Steels**.—Brailsford, 776, 1738, & 2543.
- Magnetic Tests of Electrotechnical Steel in Sheets**.—Janus & others, 2544.
- Improved Stopcock Substitute**.—Parks & Carritt, 4121.
- "Elektrische Stossfestigkeit" [Electrical Strength against Surges: Book Review]**.—Strigel, 2122.
- Stroboscopic Device for determining Speed of Mechanisms**.—Lauffer, 2988.
- Requirements for Production of Stroboscopic Image**.—Strobl, 2566.
- Magnetic Properties of Superconductors**.—Shoenberg, 786.
- Super-Microscope**.—von Borries, Ruska, 3292 3 & 4104; Ghosh, 3716 (with Chart of Comparative Limits of Resolution); Graton, 711 (Non-Electronic, at Harvard: Magnification Data); Kausche, Pfankuch, & Ruska, 3294 (Vegetable Virus made Visible); Mahl, 3717 (Diatom Photographs); Müller, 285 (Basic Principles & Development).
- Super-Microscope**: see also Electron-Microscope, and below.
- Single-Crystal Fluorescent Screens and Super-Microscopy**.—von Ardenne, 4109.
- Superstructure in FeNi₃**.—Haworth: Leech & Sykes, 777, 3352 & 4725.
- Control of Magnetic Quality by Surface Treatment**.—Warren: Kussmann, 1248.
- Charging of Dielectric Surfaces by Surge Potentials: Charge Measurements on Lichtenberg Figures**.—Conradt, 2521.
- Stabilised Sweep-Circuit Oscillator**.—Kock, 3713.
- "Hard" Valve Electronic Relay Switch**.—Clothier, 4655.
- Dual Purpose Electronic Switch [Rate 6-2000 Times per Second]**.—Hall, 1662.
- Discharge Characteristics of Switch-Gaps**.—Mochizuki & Miyoshi, 2490.
- Some Electronic Switching Circuits**.—Shunard, 747.
- Rate of Evaporation of Tantalum**.—Langmuir & Maltz, 2947.
- Evaluation of Transient Temperature Distribution in a Dielectric in an Alternating Field**.—Copple, Hartree, Porter, & Tyson, 3766.
- Temperature Rise of Insulating Materials in H.F. Electric Field**.—Okazaki, 4690.
- Temperature Ageing Characteristics of Class A Insulation, and Temperature Limits set by Oil and Cellulose Insulation**.—Smith & Scott: Hill, 4710.
- Temperature-Dependence**: see Carbon, Crystal.
- Irreversible and Reversible Changes of Magnetisation in Ferromagnetics under Tension and Mode of Increasing Magnetic Field**.—Kondorsky, 1733.
- Magnetic Studies in Ternary System Fe-Ni-Al**.—Snoek, 2550.
- New Insulating Textiles for Electrical Industry [from Fibre Glass]**.—de Ploenc, 1221.
- Crystalline Diamagnetism of Thallium**.—Rao & Narayanaswami, 782.
- Thermal Stability of Cylindrical Stratified Dielectric, and Thermal Instability of Dielectrics**.—Whitehead, Gemant, 2531, 2972 & 4145.
- Thermal Emissivity of Heated Surfaces**.—Wilson, 1214.
- Thermal Method**: see Losses.
- Thermovoltage at Element Metal/Semiconductor/Metal**.—Schweickert: Rohde: Monch, 2098.
- Extinction of Thyatron Tubes by Change of Grid Voltage**.—Lion, 1740.
- Thyatron-Controlled Thermostat**.—Sturtevant, 1160.
- Pre-Striking Conditions in Thyatron**.—Wheatcroft & Hamnerton, 1161.
- Thyatron**: see also Counter, Radiation.
- Improvements in Time-Base Arrangements of Cathode-Ray Oscillographs for Study of Periodic Electrical Phenomena**.—Legros, 4653.
- Linear Time-Sweep Circuit with Associated Frequency-Meter**.—Legros, 3714.
- Time-Sweep Generator for Cathode-Ray Oscillograph ["Stepped" Time-Base]**.—Oka, 2069.
- Production of Voltages Proportional to Time [for Cathode-Ray Time-Base]**.—Piepow, 1661.
- Time-Sweep, -Base**: see also Amplifier, Impulse, Kipp, Relaxation-Oscillators.
- Falling-Weight Time Switch**.—Irons & Bennett, 2989.
- Timer**: see Oscillograph.
- Production and Industrial Uses of Titanium [including Magnetic Alloys]**.—Comstock, 778.
- Titanium**: see also Dielectric-Constant.
- Contribution to Calculation of Leakage for Asymmetrical Disc Windings [in Transformers, etc.]**.—Knaeck, 3342.
- Separately Excited Current Transformer for Oscillography of A.C. Currents with D.C. Components**.—Kramer, 2489.
- D.C. Transformer**.—Lennox & DeBlieux, 1167.
- Rôle of Screened Transformers in Telecommunication Installations**.—Nowicki, 305.
- Kenotron Heating Transformers**.—Sakakihara, 1165.
- Transformer Windings with graduated Conductor Widths**.—Schorstein, 2554.
- Wound-Core Distribution Transformer**.—Treanor, 743.
- Choice of Transformer Dimensions**.—Unger, 3341.

Subsidiary Apparatus and Materials—

Papers on **Transformers**.—Wünsch: Käser, 2553.
Transformers: see also Permanent-Magnets, Regulating.
 New Measuring Set for **Transient Phenomena**.—Okuno & others, 2068.
Transients: see also Electrographic, Impulse, Oscilloperiturbograph.
 Dielectric Constant of Ammonium Sulphate in Neighbourhood of **Transition Point**.—Guillien, 2530.
Trolitul [Superstyrex] as Insulating Material.—Scott, 1224.
 Electron-Microscope Studies of Thoriated **Tungsten**.—Ahearn & Becker, 1668.
Tungsten-Rod Treating Equipment.—Eisler Company, 4676.
 Papers on Formation of Oxygen Films on **Tungsten**.—Morrison & Roberts, 3338.
Ultra-High, -Short: see Cathode-Ray, Dielectene, Discharges, Electron-Beam, Insulating, Iron, Micro-Waves, Permeability, Phase-Focusing, Plastics, Resistances, Spectrum-Analysis.
Vacuum Technique.—Eltenton, 1677 (Variable Greaseless Valve) & 1678 (Checking Pumping Speeds); Hickman, 3300 (New Oil-Diffusion Pumps); Lang, 3721 (Mechanical Valve); Lockenvitz, 726 (Radiometer-Type Gauge); Matricon, 4118 (Present-Day Technique for Very High Voltages); Mönch, 1145 (Book-Review); Montgomeri, 4119 (Grid-Controlled Ionisation Gauge); Rogers, 2094 (Application of "Metal" Valves in measuring Vacuum); Rubens & Henderson, 2093 (Spherical Ground Joints); Seiler, 1144 (Protection against Water-Failure); Sinelnikov & others, 2504 (Some Methods in V.T.); Strong, Pockman, 2505 (Synthetic Rubber-Like Compounds—Koroseal: Lead Gasket Seals); Townes, 727 (Greaseless Valves); Youtz, 728 (Protection against Mechanical-Pump Interruption).
Vacuum: see also Camera, Cement, Getter-, Insulating-Joints, Manometer, McLeod-Gauge, Mica-Windows, Needle-Valve, Stopcock, Water-Cooled.
Multiphase Vector Recording.—Hollmann, 2488.
 Possibility of applying **Velocity Modulation** to Ionic Tubes.—Jobst, 4647.
 Arrangement for Control or Measurement of **Very Small Alternating Currents**.—Gambetta, 3314.
Vibrator Power Supplies.—Hall, 742.
Vibrators.—Cazaly, 4195.
Magnetic Viscosity in Weak Alternating Fields [in Carbonyl Iron].—Schulze, 1727.
Viscosity: see also After-Effect.
 Method of Increasing **Voltage** of Direct Current with Condensers.—Likhoff & Pavloff, 2560.
Electromagnetic Voltage Regulators.—Kovalevskaya, 741.
Two Voltage Regulators.—Nehler & Pickering, 2105.
 Discussion on "Moving-Coil **Voltage Regulator**."—Norris, 4193.
 Design and Performance of **Voltage Regulator**.—RCA Radiotron, 4714.
Constant-Slope Voltage Control.—Tanner & Walker, 1689.
Voltage-Regulators: see also Amplifier, Regulation, Stabiliser(-ing), and below.
Voltage Stabilisation [Magnetic Stabilisers in Russia].—Sazanov, 3315.
Electronic Voltage Stabilisers.—Hunt & Hickman, 1691.
 Removal of **Wall Deposits** by High Frequency Discharges.—Hay, 298.
 Effect of **Water** on Values of Magnetic Constants of Rare Earths.—Cabrera, 1284.
 Dielectric Properties of Dielectrics Dispersed in **Water**, and Anomalous Dispersion in Bound (Oriented) Water.—Fricke, 4142.
 Simple Protective Device for **Water-Cooled Apparatus**.—Stephenson, 729.
 Photoconductivity in **Willemite**.—Hofstadter, Herman, 721 & 4661.
 Power from **Wind**: Uses for Accumulator Charging.—Beatt, 4720.
 Useful **Wind-Driven Dynamo**.—Phillips, 3786.
 Stripping Cotton and Silk from **Wire Ends**.—Chase, 4728.
 Investigations on **Wires** heated by Electric Currents.—Fischer, 2953.
 Action of Solvents and Impregnating Varnishes on Enamelled **Wires**.—Greulich, 3763.
 Current-Carrying Capacity [of **Wire**, in Free Air and in Transformer Windings].—Partridge, 746.
 New Methods of Testing Enamelled **Wire**.—Webb, 4216.
Wires: see also Rubber.
X-Rays: see Cathode-Ray, Electron-X-Ray, Superstructure.
Xenon: see Rare-Gases.
Zinc: see Alloys, and below.
 Electrical Investigations on **Zinc-Sulphide-Copper Phosphors**.—Goos, 1148.
 Similarity of Mechanisms of **Zinc-Sulphide Phosphors** and Selenium Photoelements.—Goos, 4659.
 Diffusion Action and Activation of **Zinc Sulphide**.—Graue & Riehl, 1146.
 Sensitisation of Phosphorescent **Zinc Sulphide** by Action of Red Radiation.—Saddy, 4123.

Decomposition of **Zinc Sulphide** by Light and Alpha Rays.—Streck, 1147 & 3295.
Zirconium and Compounds with High Melting Point.—Fast, 1680.

STATIONS, DESIGN AND OPERATION

"**Aeronautic Radio**" [Book Review].—Eddy, 4738.
 Mutual Interference in **Aeronautical Radio Communication**.—Matsudaira, 4736.
 Some Principles in **Aeronautical Ground-Radio-Station Design**.—Sandretto, 1754.
 Electrical Installations in **Aircraft** in France.—Hugel, 328.
 Points on Wireless Apparatus in **Aircraft**.—Viehmann & others, 4737.
 Radio in Aviation: General Survey, with Special Reference to **Royal Air Force**.—Hecht, 4226.
 Western Union to Collaborate with **Amateurs**, 3364.
 New F.C.C. [Amateur] Rules.—Warner, 794.
Amateur Radio to furnish Communication with Gatti African Expedition.—Kuth, 2588.
 Lorenz Wireless Apparatus in "Trippel" Auto [Amphibian Motor Car] on Sea-Trial Voyage, 4740.
Amplification of Wide-Band Modulated Waves: HEFOD System.—Hayasi, 2578.
Amplitude-Range Control, and Devices for controlling **Amplitude Characteristics** of Telephonic Signals.—Wright: Norway, 792.
 Improving **Articulation Quality** of Transmission Channel by Use of Special Frequency Characteristics.—Tetelbaum & Vollmer, 1293.
Asymmetric-Sideband Broadcasting.—Eckersley, 312.
Athlone Short-Wave Broadcaster, 4749.
 H.T., D.C. Quick-Acting **Automatic Circuit Breakers** for Radio Transmitting Stations.—Spirov, 317.
Automatic Controls: see also Amplitude-Range, Broadcasting, Dynamic-Range, Safety, Vogad, Voice-, Volume-Control, and below.
 Amplifiers with **Automatic Volume Compression**.—Bertolotti, 3363.
Automatic Volume Compression.—Pawley, 2576.
 The Building of **Belgian National Broadcasting Institute**.—Adam, 2145.
Broadcasting.—Preliminary Calculations, 4747; B. House, Aberdeen, 1299; Canberra B. Station, 1298; Columbia B. House, 2998; B. House, Glasgow, 319; Stolp B. Station, with Anti-Fading Aerial, 4751; Control Centre of Internat. B. Union, 2147; Bender, 2138 (Overcoming Scarcity of Wavelengths); Chinn & Moe, 4752 (Programme-Failure Alarm); Fitch & Dutera, 2577 & 3362 (Measurement of B. Coverage & Antenna Performance); Guy, 4746 (F.C.C. Rules & Standards); Hofmann, 315 (Mobile Short-Wave Transmitters for Commentaries); Nakagami & others 320 (50 kW Short-Wave B. Transmitter); Sarnoff, 2139 (Network B.).
Broadcasting: see also Asymmetric, Athlone, Belgian, Conference, Empire, Frequency-Modulation, Geneva, German, India, Italian, Line, Map, Monitoring, Outside-, Polyphase, Relay-, Safety, Sideband, Simplex, Simultaneous, Single-, Site, Start-Point, Swiss, Synchronised(-ous), Weather, Wire-.
 Transmission of Wide Frequency-Bands over **Cable**.—Agricola, 4732.
Carrier-Frequency Cable Transmission of Broadcast Programmes.—Kluge, 314.
 "5 and 10" from Shack or **Car**.—Taylor, 4223.
Car: see also Amphibian.
 Equipments for Multiplex **Carrier Telephony** on Ultra-Short Waves.—Matsumae & Yonezawa, 2570.
 Break-In Telephony with **Carrier Suppression**.—Kaplan, 1755.
 "Humber Radio" [G.P.O. Coastal Station].—Ainslie, 325.
Common-Wave: see Synchron-, Wire-Broadcasting.
 Reduction of Sideband Width by Use of "Composite" Modulation.—Hayasi & Yamagawa, 1753.
 European Broadcasting **Conference**, Montreux, 1939, 4234 & 4745.
 Situation of French Broadcasting after European **Conference** at Montreux.—Adam, 2997.
 Cairo World Communications **Conference**.—Hornung, 322.
 Cairo Radio-Communications **Conference**, 1938.—Picault, 3798.
 Modern Radiotelegraph **Control Centre**.—Rau & Brown, 4236.
Cross-Channel Ultra-Short-Wave Radio Link, 789.
 Non-Linear **Cross-Talk** in Multiple Systems with Transmitted Carriers.—Hölzler, 790.
Decimetre-Wave Radio Link between Eindhoven and Nimeguen.—von Lindern & de Vries, 1286.
 New "Deutschlandsender," 3793.
Duplex Simultaneous Radio-Telephony [on the Persistence of Hearing Principle].—Marro, 1260 & 4228.
 Devices for Widening **Dynamic Range**.—Govydinov & Sobolev, 1291.
 Radio for Power Companies [Ultra-Short-Wave Licences for Speeding-Up **Emergency Service**].—2132.
 112-Mc Pack Set for **Emergency and Field Use**.—Chambers, 3360.
Emergency: see also Amateurs, Forest, Police, Portable.
Empire Service Broadcasting Station at Daventry.—Hayes & MacLarty, 2140 & 4748.

Stations, Design and Operation—

- Empire Telegraph Communications.—Wood, 2141.
 Errors : see Printing, Telegraphy.
 Forest Service develops Bell-Ringing Radio Device, 4224.
 Forest Radio Service.—Waltz, 2134.
 Frequency : see Monitor, and below.
 First High-Powered Radio Station without Static [Frequency-Modulated Station], 2135.
 New Broadcasting System [at Columbia University, using Frequency Modulation], 2136.
 Frequency Modulation Demonstrated.—Armstrong, 3361.
 Frequency Modulation Fundamentals.—Noble : Armstrong, 4222.
 Field Tests of Frequency- and Amplitude-Modulation with Ultra-High-Frequency Waves.—Weir, 3738.
 Frequency Modulation : see also Phase.
 Description of Prangins Radio-Telegraphic Station [Geneva Transmitting Station].—Anselmi, 2144.
 Development and Scope of German Overseas Wireless Service.—Gerlach, 2582.
 Germany's Broadcasting System, and The Present Position of German Broadcasting Technique.—Heilmann : Sennu, 1295.
 Historical Development of German Overseas Wireless Communication.—Kummerer, 2579.
 German-Austrian Broadcasting System.—Schwaiger, 321.
 German(y) : see also Transoceanic.
 Great Lakes Radiotelephone Service.—Martin, 4225.
 Radiotelephone System for Harbour and Coastal Services.—Anderson & Pruden, 2999.
 Ship Equipment for Harbour and Coastal Radiotelephone Service.—Bair, 3001.
 Impulse System : see Printing.
 Short-Wave Broadcasting in India [and Choice of Wavelengths], 4750.
 Broadcast Networks in India.—Frome, 1296.
 Tentative Standard of Medium-Wave Broadcast Transmission Service for India, and Medium-Wave Short-Wave Situation in India and Abroad.—Sreenivasan, 1297.
 Highly-Damped Radio Transmission Method for Interference Transmissions.—S.A.F.A.R. & Castellani-Milano, 4735.
 Italian Broadcasting in 1939 : Book Review, 2146.
 Line Equalisation by Predistortion.—Greener, 1749.
 High-Frequency Attenuation on Open-Wire Lines [and Influence of Sleet and Frost].—Curtis, 1289.
 Carrier Telephone System using Lighting and Power Distribution Lines.—Shinohara, Hirano, & Yoshioka, 4742.
 Lines for Broadcast Transmissions.—Wolf, 4233.
 Lines for Outside Broadcasts.—Woods, 316.
 Lines : see also Cable, Carrier, Wire-Broadcasting.
 Experimental Proof of Possibility of Long-Distance Communication on 16 cm Waves.—Berline & Gutton, 2568.
 "World-Radio" Short-Wave and Time-Zone Map of World, 323.
 Wireless on the "Mauretania," 3367.
 Micro-Wave Telephony : Installation at Bordeaux.—Soc. Française Radiélectrique, 2131.
 Micro-Waves : see also Decimetre, Long-Distance, One-Metre, Portable.
 New Type of Direct-Reading Radio-Frequency Monitor.—Matsumura & Kanazaki, 318.
 Monitoring Rack for Wireless/Landline Installations.—Barkow & Künzel, 4237.
 Frequency-Monitoring Unit for Relay Broadcasting Stations.—Curran, 1748.
 Importance of Monitoring Loudspeaker in Broadcasting.—Waite, 2995.
 Radiotelephonic Communications in High Mountains by Metric Waves.—Loeb, 3359.
 Exploring below One Metre.—Tynes & Babcock, 2990.
 New Equipment for Outside Broadcasts.—Barrett, Mayo, & Ellis, 3797.
 Power Supply for Outside Broadcasts.—Cooper, 3795.
 "Mixing" and "Cueing" at Outside Broadcast Points.—Williams, 793.
 Experiment in Parallel Operation of Oscillators on Short Waves.—Nevvazhski, 3791.
 Persistence of Hearing : see Duplex-Simultaneous.
 Communications by Phase Modulation.—Crosby, 2137.
 "Police Communication Systems" [Book Review].—Leonard, 2133.
 German Police Wireless Network.—Schlake, 4734.
 Ultra-Short-Wave Police Radio Telephone Installations in Oslo and Stockholm.—Weider, 4733.
 Polyphase Broadcasting.—Byrne : Collins Radio, 4229.
 PM-5 Portable Radio Set.—Bell Tel. Company, Antwerp, 4743.
 Portable Ultra-Short-Wave Transmitter-Receiver.—Michel & Gutton, 2569.
 Trials of Impulse System of Type-Printing Telegraphy.—Hudec, 2143.
 Radio Teletyping.—Le Matériel Téléphonique, 2583.
 Papers on Wireless Printing Telegraph Systems.—Sugiyama & others, 2585.
 Quartz : see Monitor.
 Ultra-High-Frequency Equipment for Relay Broadcasting.—Brown, 1747.
 Practical Application of an Ultra-High-Frequency Radio-Relay Circuit.—Smith, Kroger, & Geule, 1285.
 Rugby Radio Station.—Gracie, 3794.
 Safety Interlocks at Transmitting Stations [e.g. Droitwich].—Hotine, 3796.
 Selective Sideband versus Double Sideband Transmission of Telegraph and Facsimile Signals.—Smith, Trevor, & Carter, 1751.
 Coastal and Harbour Ship Radiotelephone Service.—Swingle & Bailey, 3002.
 Radiophone Service for Small Ships.—Dudley, 3368.
 Relation between Power radiated by Ship Station and Number of "Metre-Amperes."—Marique, 2586.
 Ships, etc. : see also Coastal-Station, Great-Lakes, Harbour-&Coastal, Mauretania, Small-Vessels, Steamer, Submarines, Yachts.
 Short-Wave : see Broadcasting, German(y), Map, Parallel-Operation, Single-Sideband, Swiss.
 Sideband : see Asymmetric, Composite-Modulation, Selective, Single.
 Simplex System for Remote Programs.—Long, 1750.
 Simultaneous-Broadcast Circuits.—Peachey, 2996.
 Contribution to Theory and Technique of Wireless Single-Sideband Telephony.—Huberkant & Meinel, 2994.
 Discussion on "Single Sideband Telephony applied to Radio Link between Netherlands and Netherlands East Indies."—Koomans, 313.
 Experiment by Single-Sideband Multiplex Radio System between Tokyo and Kagoshima.—Matsumae & others, 324.
 Short-Wave Single-Sideband Radio-Telephone System.—Oswald, 1752.
 Single-Sideband Modulation, Transmission and Reception.—Peschke, 2575.
 Remarks on Single-Sideband Working in Television.—Urtel, 4731.
 Determination of Most Favourable Site for Broadcast Station on 301.5 Metres.—Koomans, 4232.
 Radio-Telephone Set for Small Vessels.—Browne, 1300.
 Start Point : Main Transmitter in B.B.C.'s New West Regional Scheme, 3365 & 3366.
 Wireless Installation on Twin-Screw Steamer "Nieuw Amsterdam," 3003.
 Tests on Radiocommunication with Submerged Submarines.—Houtsmuller, 4227.
 Radio over Supply Mains.—Eckersley, 3790.
 Swiss Short-Wave Transmitter at Schwarzenburg, 2142.
 Propagation of Synchronised Waves, and Reception of Common-Wave Stations.—Bernetti, 3792.
 Synchronous Operation of BBC Transmitters.—Varley, 4231.
 Decreasing Liability to Errors of Wireless Telegraphy Links by Measures taken in L.F. Part.—Reche, Arzmaier, & Zimmermann, 2584.
 Wireless Telephone Circuits as Links in World Telephone Network.—Streeker & Hölzler, 2581.
 Development of Transoceanic Short-Wave Transmitting Service in Germany.—Buschbeck, 2580.
 Present Position of Transoceanic News Transmission.—Kotowski, 1294.
 Possibility of Two-Channel Communication with Single Carrier Wave.—Anitov & Kenigsen, 791.
 Revised Ultra-High-Frequency Allocations, 3789.
 Ultra-High, -Short : see also Car, Carrier, Cross-Channel, Emergency, Frequency-Modulation, Micro-Waves, Mountains, Phase-Modulation, Police, Portable, Relay, Single Sideband.
 Vogad for Radiotelephone Circuits.—Wright, Doba, & Dickieson, 3000.
 Voice-Operated Level Control System for Telephone Networks.—Reeves, 2148.
 Voice-Frequency Volume Control.—Jefferson & Colchester, 1292.
 Experiment on Broadcasting of Weather Charts by Radio.—Niwa & Hayashi, 4739.
 Wired Wireless Broadcasting : Post Office Rediffusion Scheme, 2571.
 Apparatus for High-Frequency Control of Transmitters for Common-Wave Wire Broadcasting.—Bender, 2574.
 High-Frequency Wire Broadcasting [in Germany].—Budischin and Deklotz, 4741.
 Wire-Broadcasting Separating Filters at the Telephone Exchange.—Hinze, 2992.
 Distribution of Powers in Amplifier Station, and Wire Broadcasting Group Connection.—Klein, 2572 3.
 Wire-Broadcasting Wall Socket.—Klein, 4230.
 Electrical Conditions for Wire-Broadcasting Separating Filters.—Waldow, 1287.
 Investigation of Transmission Conditions of Overhead Lines with Special Attention to Wire Broadcasting.—Waldow, Spang, & Fritzsche, 2991.
 Wire Broadcasting [Review of Systems in Use or Proposed].—Walmsley, 1288.
 New Appliances for Wire Broadcasting Installations.—Weissshuh & Budischin, 2993.
 Wire Broadcasting : see also Cross-Talk, Supply-Mains.

Stations, Design and Operation—

Ranges, Choice of Waves and Powers of **Wireless Stations** for Different Types of Service.—Lenz, 4235.
 Radiotelephone for Small Yachts.—Byrnes, 2587.
 Midget Marine Radio Telephone [for Yachts etc.]—Western Electric, 4744.

GENERAL PHYSICAL ARTICLES

Photoelectric Absorption of Radiation in Gases.—Ditchburn, 334.
 Molecular Aspect of Energies of Adhesion between Various Liquids and Solids : **Adsorption** as Result of Electrostatic Forces.—Boyd & Harkins, 2159.
 Statistical Theory of **Adsorption** of Double Molecules.—Chang, 3376.
 Use of Surface States in Solids to Explain Activated **Adsorption**.—Pollard, 4249.
 New Representation of "Distortion Power" of **Alternating Current** with Help of Functional Space.—Quade, 4765.
 Multiple Nomogram for **Atomic Constants**.—Beth, 4757.
 Re-Evaluation of **Atomic Constants**.—Dunnington, 3007.
 Passage and Diffusion of Corpuscles across **Barriers** of Coulombian Potential.—Badarau, 797.
 Remarks on Theory of **Brownian Movement**.—Niessen & Bakker, 796.
Brownian Movement : see also Recombination, Resistances.
 Resistivity and Power Input in **Caesium Discharge** at High Current Density.—Möhler, 1756.
Carrier Mobility Spectra of Liquids Electrified by Bubbling.—Chapman, 331.
 Effect of Thermal Agitation on Intensity of Reflection of **Cathode Rays** from Crystals.—Coster & van Zanten, 1310.
 Static Interaction of **Charged Particles**.—Thomas, 329.
Collisions : see Maxwell's-Law.
 "Mécanique ondulatoire des Systèmes de Corpuscles" [Book Review].—de Broglie, 4245.
 Contemporary Advances in Physics : Particles of **Cosmic Rays**.—Darrow, 2154.
Crystals : see Cathode-Rays, Magnetic.
 Detection of Single Positive Ions, Electrons, and Photons by Secondary Electron Multiplier.—Allen, 3373.
Diamagnetism of Rare Atmospheric Gases, Argon, Krypton, Xenon.—Ahouncenc, 3374.
 Generalised Formula for **Doppler Effect**.—Fleischmann, 3803.
Eddies : see Maxwell's-Equations.
 "Interprétations physiques de la Théorie d'Einstein" [Book Review].—Dive, 2590.
 Comprehensive Fundamental **Electrical Formula**.—Drysdale, 1302.
 Generalisation of Kaluza's Theory of **Electricity**.—Einstein & Bergmann, 2589.
 Integration of Equations of Motion of **Electrified Particle** of Variable Mass, subjected to Action of Any Electric and Magnetic Fields Whatever.—Opatowski, 2149.
Electrified : see also Electrical-Formula, Maxwell's-Equations, Particle.
Electrodynamics of Material Media.—Eckart, 1305.
 Hamilton-Jacobi Theory and Quantisation of Generalised **Electrodynamics**.—Weiss, 1307.
 Distribution of Charge and Potential in **Electrolyte** bounded by Two Plane Infinite Parallel Plates.—Rosenhead, 3804.
 Experiment on **Electromagnetic Induction** by Linear Motion.—Cullwick, 4250.
 "Electromagnetics : Discussion of Fundamentals" [Book Review].—O'Rahilly : G.W.O.H., 801.
 "Fundamentals of **Electromagnetism**" : Some Criticisms of Restatement of Principles [in Book Review].—Howe : Cullwick, 4764.
 Classic Experiments [in **Electromagnetism**].—G.W.O.H., 4763.
Electron.—Banerjee & Plattanaik, 328 (Determination of E. Charge and Viscosity of Air) ; Fortier, 2153 (ditto) ; Frenkel & Rojansky, 2592 (Theory of Spiral Orbits in Coulomb Field) ; Healey, 3375 (Behaviour in Iodine Vapour) ; Laby & Hopper, 2152 (E. Charge) ; Loiseau, 4755 (Diffraction of Es : Hyper-Ether) ; Mercier, 1760 (Intrinsic Energy) ; Papapetrou, 4243 (Diamagnetism of E. Gas) ; Weisskopf, 3801 (Electromagnetic Field produced by E.) ; Zaitzev, 4244 (Temperature of Es. in Electric Field, Calculation of Townsend's Alpha). See also Detection, e,m, Particle, Point-Charge.
 Method of Solving Fundamental Problem of **Electrostatics** and Related Problems.—Grünberg, 798.
Elementary Particles : see Particles.
 New Method of Determining **e m** for Medium High Velocities.—Aharoni, 4240.
 Refraction of X-Rays in Diamond Prism, and Spectroscopic and Free Electron Values of **e m**.—Bearden, 800 & 3006.
 Present Status of Value of **e m**.—Birge, 1311.
 Present Dilemma regarding Values of Natural Constants **e, m, and h** : New Graphical Method of Presentation.—DuMont, 4756.
 New Contributions to Problem of **Energy Transmission** by Elementary Collision Processes.—Schüler & Haber, 4239.
Galvano-Magnetic Phenomena in a Dielectric Material.—Mica.—Prujina-Granovskaja, 3008.
 Influence of Interaction of More than Two Molecules on Molecular

Distribution-Function in Compressed Gases.—de Boer & Michels, 1757.
 Internal Friction of **Gases** [including Variation with Temperature].—Weber, 3371.
 Velocity of Light expressed by means of **Gravitational** and Electrical Constants.—Labocetta, 333.
Gravitational Constant, **Dielectric Constant**, and **Cosmic Constant**.—Labocetta, 1304.
 Behaviour of Interferometer in **Gravitational Field**.—Ives, 3369.
Interferometer : see Gravitational-Field.
 Townsend **Ionisation** Coefficients and Glow Potentials in Argon/Barium Phototube.—Engstrom, 2158.
 Determination of **Ionisation** Coefficients α and γ in Gases.—Gosseries, 3005.
 Townsend Coefficients for **Ionisation** by Collision in Pure and Contaminated Hydrogen.—Hale, 3372.
Ionisation by Collisions of Positive Ions.—Townsend, 3799.
Ionisation : see also Caesium, Townsend.
Ions : see Detection, Recombination.
Kerr Effect : see Polarisation, and under "Phototelegraphy & Television."
 Unification of Equations of **Laplace** and **Poisson**.—Labocetta, 3802.
 Possibility of Neutrino Theory of **Light**.—Sokolow, 332.
Light : see also Gravitational.
 Remark on **Magnetic** Properties of Gas obeying Bose-Einstein Statistics.—Neel, 3800.
 Peculiarities of Hall Effect in Single Crystals of Zinc, and Change of Resistance of Single Crystals of Zinc in **Magnetic Field**.—Noskov : Lasarew & Noskov, 3009.
Magnetic, Electric, Electrodynamic, and Electromagnetic Actions in Rigid or Deformable Bodies.—Roy, 2593.
Magnetic : see also Galvano-, and below.
Magnetism and Maxwellian Theory.—Drysdale, 2157.
Maxwell's Equations and Series of Eddies.—Reulos, 2150.
 Study of Collisions between Groups of Elastic Spheres : Derivation of **Maxwell's Law** of Distribution of Velocities.—Peter, 1759.
 Radiofrequency Spectrum of HD Molecule in **Magnetic Fields**.—Kellogg & others, 4758.
Natural Electromagnetic Oscillations of a Cavity and **Natural Electromagnetic Oscillations** of Dielectric Spaces.—Jougnet : Borgnis, 4238.
 High-Altitude Research leads to Identification of "**Neutretto**", Another Atomic Particle.—Shonka, 799.
 Report on Limits between which Approximate Methods of Geometrical **Optics** are Valid in Wave Optics, with Application to Radioelectric Waves.—Manneback, 4753.
Oscillations : see Natural.
Particles : see Charged, Electrified, Neutretto, Point-Charge, Relativity, Single, Spin.
Photoelectric : see Absorption.
Photons : see Detection.
 Discrepancies between **Physicists and Engineers**.—O'Rahilly, 3370.
 "Introduction to Contemporary **Physics**" [Book Review].—Darrow, 4761.
 Classical **Point Charge**.—Groenewold, 1762.
 Self-Energy and Gravitation Field of **Electrical Point Charge**.—Hönl & Papapetrou, 4242.
 Electromagnetic Energy of **Point Charge**.—Pryce, 330.
 New Model of **Point Charge** Electron and Other Elementary Particles.—Stueckelberg, 4241.
Poisson : see Laplace.
 Theory of **Polarisability** [Quantum-Mechanical Proof of Silberstein's Formula].—Biedermann, 4759.
 Theory of Electric **Polarisation**, Electro-Optical Kerr Effect, and Electric Saturation in Liquids and Solutions.—Piekar, 4247.
 Problem of **Potential Barriers** and Solution of Schrödinger Equation.—Datzef, 1309.
Potential Barriers : see also Barrier.
Poynting's Law : Discussion at Informal Meeting of I.E.E., 1301.
 "Fundamental Principles of **Quantum Mechanics**, with Elementary Applications" [Book Review].—Kemble, 1308.
 "Lectures on **Quantum Mechanics**" [Book Review].—Siddiqi, 4760.
 Fluctuations in **Electromagnetic Radiation**.—Born & Fuchs, 1306 & 2591.
 Theory of **Radiation**.—Schott, 4246.
Radiation : see also Absorption.
 Demonstration of **Ramsauer Effect** with Cathode-Ray Oscillograph.—Kollath & Stuedel, 1758.
 Initial **Recombination** of Ions.—Onsager, 795.
 On Equations of Elementary Particle in Theory of **Relativity**.—Caldirola, 2151.
 Theory of Electrical **Resistance** of Good Conductors.—Sauter, 2156.
 Brownian Motion in Electric **Resistances**.—Bakker & Heller, 2155.
 Development and Progress in Determination of Magnitude and Charge of **Single Particles**.—Ehrenhaft, 327.
Spin of Atomic Particles.—Frenkel, 1303.
 Nature of Geometrical, Mechanical and Physical Entities : Importance of Consideration of **Symmetries and Dissymmetries**.—Bouthillon : Brylinski, 4248.

General Physical Articles—

International Temperature Scale and Some Related Physical Constants.—Wensel, 3004.
 Remark on Fundamental Relations of Thermomagnetism.—Fokker, 4762.
 Comment on Paper by Bows, "Second Townsend Coefficient."—Kaplan, 1761.
 Hamilton's Canonical Equations for Motion of Wave Groups.—Fokker, 4754.

MISCELLANEOUS

Mathematics, Statistics, etc.: see below.
 Electrical Algebraic Equation Solver.—Herr & Graham, 339.
 Book Reviews.—"L'Istituto Naz. per le Applicazioni del Calcolo," 3384; "Théorie invariante du Calcul des Variations" & "L'Affinité" (de Donder) 1316; "Frequency Curves & Correlation" (Elderton) 2165; "Die Differentialgleichungen der Technik u. Physik" (Hort, Thoma) 4254; "Einführung in die tech. Schwingungslehre" (Klotter) 343. Also alphabetically.
 Cartesian: see Positive & Negative.
 Graphics in Solution of Complex Quantities.—Goodale, 811.
 "Theory and Use of Complex Variable" [and Conformal Transformation: Book Review].—Green, 4766.
 Coordinates: see Cartesian, Integrator.
 Method of Correlation Analysis.—Delaporte, 3809.
 Posterior Probability Distributions of Ordinary and Intraclass Correlation Coefficients.—Jeffreys, 341.
 Approximation Formulae for Well-known Difference of Products of Two Cylinder Functions.—Buchholz, 2599.
 Differential Analyser and Applications in Electrical Engineering and Application of Differential Analyser to Transients on Distortionless Transmission Line.—Hartree & Nuttall: Hartree & Porter, 803.
 Papers on Small Differential Analyser and Automatic Curve-Following Device.—Lennard-Jones & others, 4255.
 Simplified Calculation of Arbitrary Constants of Linear Differential Equation of Second Order with Constant Coefficients.—Feinberg, 3382.
 Application of Cathode-Ray Tube to Electrical Solution of Differential Equations.—Kleinwächter, 2594.
 Integrator for Solution of Differential Equations of Second Order.—Myers, 3807.
 "Partielle Differentialgleichungen . . ." [and Application to Physical Problems: Book Review].—Riemann, 338.
 Equivalent Values of Distributed Constants.—Kharkevitch, 2162.
 "Lectures on Mathematical Theory of Electricity" [Book Review].—Pidduck, 812.
 Limit Problems for Equations of Elliptico-Parabolic Type.—Piskounov, 1774.
 New Methods for Approximate Solution of Systems of $p \geq 2$ Equations with p Unknowns.—Platon, 1315.
 Comparison of Series of Measures on Different Hypotheses concerning Standard Errors.—Jeffreys, 340.
 Fluctuations in Neighbourhood of Periodic Motion of Auto-Oscillating System.—Berstein, 1765.
 Method of calculating Fluctuations.—Ellickson, 807.
 Machine for Rapid Summation of Fourier Series.—Bevers, 4253.
 Remarks on Use of Fourier Integral.—David, 1312 & 3377.
 Auxiliary Equation for Use with Heaviside Expansion Theorem.—Coulthard, 2595.
 Theorem of Functional Analysis, and Problem of Cauchy for Quasi-Linear Hyperbolic Equations.—Soholeff, 1767.
 Computation of Hyperbolic Functions built on Special Symbols.—Hayata, 1768.
 Symmetrical-Component Impedance Notation.—Kimbark, 810.
 Integrator for Polar, Rectangular, and Curvilinear Coordinates.—Lugeon, 3812.
 Laguerre: see Whittaker.
 Laplace Transformation Theorem for Separation of Steady-State and Transient Processes.—Droste, 3010.
 Remarks on Least Square.—Goto, 1313.
 Note on Graduation by Method of Least Squares.—Nair, 2602.
 Comparative Accuracy and Speed of Gauss's Method of Least Squares and Recent Alternative Methods for Adjustment of Observations.—Weise & Patzer, 1772.
 Some Formulae for Associated Legendre Functions of First Kind.—MacRobert, 3378.
 "Lanchester's Potted Logs" [Book Review], 2604.
 Models for Logarithmic Graph Paper.—Walther & others, 1771.
 Loge X.—Lorenzen, 2160.
 Establishment by American Mathematical Society of New Periodical, 4767.
 Papers on Co-ordination of Mathematics and Physics with Electrical Engineering, 2167.
 Mathematics for Radio and Communication [Book Review].—Madel, 3383.
 Matrix: see also Quadripole.
 Matrix Method of Treating Alternating-Current Phenomena.—Noda, 2601.
 "Nomogram—Theory and Practical Construction of Computation Charts" [Book Review].—Alcock & Jones, 3810.

Replacement of "Curve Tables" by Nomograms.—Walther, Dreyer, & Schüssler, 1770.
 Nomograms for Complex Quantities.—Zimmermann, 1769.
 Nomograms in E.T.Z.—Zimmermann, 3811.
 Operational Forms and Contour Integrals for Struve and Other Functions, and Operational Form of $f(t)$ for a Finite Interval, with Application to Impulses.—McLachlan, 335.
 Fundamental Principles of Operational Calculus.—Nucci, 3806.
 Operational Calculus.—Pipes, 2166, 2596, & 3381.
 Calculation of Energy in Oscillating System by Operational Calculus.—Rimski-Korsakov, 2597.
 Operational: see also Whittaker.
 Paper: see Logarithmic, Loge, Probability.
 Positive and Negative: an Alternative (Non-Rotative) Convention.—Turnbull, 2603.
 Frequency Interpretation in Inverse Probability.—Deming: Jeffreys, 2164.
 Note on Use of Probability Paper.—Selwyn, 1314.
 Transformation to Principal Axes of Quadripole Matrices and Their Application.—Weizel, 3011.
 Relaxation Methods applied to Engineering Problems.—Bradfield & others, 344, 808, & 4163.
 General Theory of Relaxation Methods applied to Linear Systems.—Temple, 809 & 2598.
 Correction of Experimental Curves for Resolving Power of Apparatus.—Spencer, 2161.
 Device for Compounding Sine Functions.—Maxwell, 4252.
 Critical Considerations on Integral Equation of Skin Effect.—Letowsky, 336.
 Radio Slide Rule.—Morrison, 4256.
 New Developments in Construction of Slide Rules.—Wasms, 2605.
 Vector Slide Rule.—Wicht, 345.
 General Graduation Formula for Smoothing of Time Series.—Schumann, 806.
 Mechanical Device for Smoothing Data.—Schumann, 3808.
 Statistical Test for Adequacy of Theory in Light of Experiment.—Beth, 805.
 Statistical Laws of Nature.—Born, 804.
 Statistical Theory applied to Testing of Mass-Produced Articles.—Parker, 1773.
 "Statistical Physics" [Book Review].—Landau & Lifshitz, 342.
 Tensor Analysis and Application to Equivalent Circuits.—Epstein, 1766.
 Tensors and Electrical Networks.—Ingram, 3805.
 "Tensor Analysis of Networks" [Book Review].—Kron, 2600.
 Integral Representations for Products of Whittaker Functions.—Erdélyi, 337.
 Complete Set of Asymptotic Formulas for Whittaker Function and Laguerre Polynomials.—Taylor, 3379.
 Short Note on Whittaker's Solution of Equation of Wave Motions.—Syono, 3380.

OTHER MISCELLANEOUS

Laboratory Method of Measuring Energy Absorbed by Living Organism in Ultra-High-Frequency Field.—Fridman, 2610.
 Absorption at High [and Ultra-High] Radio-Frequencies of Dihydro-naphthalene.—Cavallaro & Lucchi, 1322.
 Absorption: see also Cathode-Rays, Organic-Structure, Supersonic. A.E.G. Research, 3841.
 Radio Control of Powered Models [Aeroplanes].—De Soto, 362 & 829.
 Distant Control of Model Aeroplanes, 2628.
 Radio Control System for Model Aircraft.—Weiss, 363.
 Aircraft: see also Aeroplanes, Book-Review, Vibration.
 Electrical Discharge of Conductor by Hypersonic Air Current.—Yadoff, 4770.
 Practical Aspects of Wide-Band Amplifier Design.—Everest, 3021.
 Application of Proportional Amplifier to X-Ray Structure Analysis.—Isajev, 4263.
 Use of Proportional Amplifiers for X-Ray Intensity Measurements.—Bibergal & others, 4264.
 Analysis: see Opacimeter, Spectrochemical.
 Annual Review Features [including Broadcasting, Television, and Radio Research], 2235.
 Design and Construction of Experimental and Research Apparatus.—Newman & Clay, 3845.
 Automatic: see Control.
 Recent Tube Applications to Automobile Making.—Powers, 4259.
 Balancing: see Phase-Indicator.
 Possible Extension of Bibliographic Service of *L'Onde Electrique*, 2025.
 Bibliography: see also Decimal, Electronics, Literaturkartei, Periodicals.
 Heating of Biological Cell Matter and Fluids by Very Rapid Electrical Oscillations and Applicability for Medical Purposes.—Spiller, 852.
 Biological, Medical, etc.: see also Absorbed, Absorption, Amplifier, Cardiograph, Cathode-Ray, Cyclotron, Diathermy, Electrical-Field, Electro-Culture, Electrodynamic-Field, Electron-Bombardment, Electron-Microscope, Electron-Probe, Electrophysiological, Eye, Faradic, Light, Medical, Mirror, Nerve, Pharmacy, Poly-

Miscellaneous—

- electrophysiology, Radiesthesia, Radioactive, Radiotherapy, Shock, Sterilisation, Stethophone, Telesurgery, Temperature, Ultra-Short.
- Papers on Radiation from **Black Body**.—Benford, Worthing, 2191. See also 4800.
- André **Blondel**, 1863–1938, 1763 & 3813.
- Automatic Regulator for Steam Boilers.—Goldfarb, 356.
- Book Reviews**.—394, "VDI-Jahrbuch 1938"; 2215, "Admiralty Handbook of Wireless Telegraphy, 1938: Vols I & II"; 3416, "Report of Department of Scientific and Industrial Research for 1937–1938"; 3417, "National Physical Laboratory, Abstracts of Papers, 1937"; 3418, "Jahrbuch 1938 der deutschen Luftfahrtforschung" [Aeronautical Research]; 3825, "I.E.E. Regulations—11th Edition"; 3826, "Institute of Radio Engineers Standards, 1938: Electronics"; 3840, "Mitteilungen aus der Forschungsanstalt der deutschen Reichspost (RDF)"; 4811, "Mitteilungen aus dem Reichspostzentralamt"; 2217, "Encyclopédie de la Radioélectricité."—Adam; 3332, "Fundamental Electronics and Vacuum Tubes."—Albert; 2220, "Radio Amateur's Handbook."—American Radio Relay League; 3830, "History of Radio to 1926."—Archer; 3328, "Radio-technique."—von Ardenne, Fehr, & others; 3829, "Elements of Radio Communication."—Brown & Gardiner; 1337, "Publications under Auspices of Belgian Institute of Radio-Scientific Researches."—de Donder & others; 3837, "Reports on Progress in Physics: Vol. 5."—Ferguson; 3827, "Télégraphie et Téléphonie sans Fil."—Gutton; 3835, "Principles of Electricity and Electromagnetism."—Harnwell; 3833, "Telephony: Vol. 2—Automatic Telephony."—Herbert & Procter; 822, "Radio-technica: Vol. 3—Pratica di Radiotrasmissione e Ricezione."—Hoepfli; 2206, "Der Indikator" [Theory and Mechanical, Optical, and Electrical Types].—de Juhasz & Geiger; 820, "Encyclopédie de l'Électricité et de la T.S.F. à Bord des Avions modernes."—Lanoy; 3834, "Educational Broadcasting, 1937."—Marsh; 3836, "High-Frequency Alternating Currents."—McIlwain & Brainerd; 3831, "Radio Handbook, Fifth Edition."—Editors of *Radio*; 2219, "Amateur Radio Handbook."—Radio Soc. of Great Britain; 821, "Problems in Radio Engineering."—Rapson; 4798, "Theory and Application of Electron Tubes."—Reich; 819, "Radio Laboratory Handbook."—Scroggie; 2218, "Radio Manual."—Sterling; 823, "Fundamentals of Radio."—Terman; 824, "Van Nostrand's Scientific Encyclopedia." See also Dictionaries.
- Consumption of Electrical Energy by **Broadcasting Stations**.—Dennhardt, 817.
- Electrical Services in Large **Buildings**.—McDonald & Carter, 1336.
- Effect of Temperature on Non-Loaded Carrier Cable, and Completion of Tyosen Strait Non-Loaded Cable Circuit.—Simizu & Miyamoto; Matsumae, 4808.
- Identifying Cable Wires.—Crisfield, 2207.
- Electro-Cardiograph.—Cossor, 1780.
- Multiphase Vector Recording and Practical Application to Electro-cardiography.—Hollmann, 2611.
- Electro-cardiograph using Television Technique.—Walker, 3861.
- Improved Three-Channel Carrier Telephone System, and Twelve-Channel Carrier Telephone System for Open-Wire Lines.—O'Leary & others; Kendall & Aitel, 2621.
- Carrier Current on Power Systems.—Richardson, 370.
- Cathode-Ray** Oscillograph as Auxiliary in Measurement of Vibrations, Sound, and Pressure.—Swedenborg, 2194.
- Biological Effects of Low-Velocity **Cathode Rays**.—Haskins, 378.
- Preliminary Investigation of **Cathode Rays**.—Trump, van de Graaff & Cloud, 4783.
- Cathode-Rays**: see also Cathodograph, Differential Equations (in Mathematical Section), Electron-Bombardment, Museum, Phase-Indicator, Polyelectro-, Pressure, Spectroradiography.
- Sparking Equipment for High-Frequency Filming of **Cavitation** Region.—Ivanov, 3400.
- Conference of Technical Advisory Committees of **CCIF** in Oslo.—Oehlen, McCurdy, 400 & 816.
- Cerenkov**: see Radiation.
- Ultra-Violet **Chemiluminescence**.—Gurwitsch & Gurwitsch, 3862.
- Measuring **Chlorophyll** Concentration.—Johnston, 4807.
- New **Chronograph** and Applications.—Aoki, 1328.
- Cinematographic** Method of Studying and Timing Manual Operation as used in Communication Electrical Industry in U.S.A.—Jurgens, 4269.
- Cinematography** of Thousand-Millionth of a Second: Pressure of Detonation.—Libessart, Culmann, & Séguin, 4270.
- Cinematography**: see also Cavitation, X-Ray.
- Relation between Hydration and Dielectric Constant of **Colloidal Hydrophiles**.—Overbeek, 385.
- Colloids**: see also Electro-Optical.
- Colorimeters**.—Klopsteg; Hare & Phipps, 1333 (and Alleged Difficulties with Single Cell); Lange, 1332 (using Selenium Cell); Miller, 4799 (Recording Device for C.). See also Photoelectric-Cell.
- Interpretation of Benham Colour Phenomena [Chromatic Top] in terms of Hysterical Augmentation Theory.—Naidu, 1321.
- Comité Consultatif International Téléphonique**: Meeting of Sub-Committees London, Dec. 1938, 3850.
- Communications** Engineering Institute of Vienna Technical High School.—Petrtsch, 2222.
- New Electro-Mechanical Effect in **Concrete**.—Pokrovski, 2198.
- Conductivity**: see Electromagnetic-Induction.
- New Method of Connection of Multi-Grid Valve for D.C. Amplification [for Automatic Control & Other Purposes].—Boucke, 830.
- Precision **Control** of Large Powers by Ionic Tubes.—Herzog & Vahadis, 4797.
- Viewpoints for Choice of Remote **Control** [and Telemetering] Systems and of Transmission Channel.—Venzke, 833.
- Control**: see also Aeroplanes, Aircraft, Boilers, Cultivator, Motors, Perrnatron, Photoelectric-Cell, Relay, Strobron, Telectron, Telemetering, Temperature.
- Conventions**, etc.: see CCIF, International, IRE, Physical, Physiker-tag, Protective, Radioplonic, Relaxation, VDE, World-Radio.
- Copying**: see Microfilms, Photographic, Research.
- Corrosion** in Plant and Instruments for Transmission of Intelligence.—Haehnel, 4257.
- Cosmic Rays**: see Radiations.
- Crystals**: see Photoelasticity, Radiation, X-Ray.
- Agricultural Novelty: **Cultivator** with Photoelectric Control.—Ferte, 3868.
- Cyclotron** and Applications [particularly Biological].—Chadwick, 380.
- Biological Effect of Radiation of **Cyclotron**.—Nakaidzumi & Murati, 379.
- Universal **Decimal Classification** of Information.—Wright, 3821.
- Gamma-Ray **Defectoscopy**.—Gurevich, Zhdanov, & Roschin, 2203.
- Simplest Calculations for Problems of Magnetic **Defectoscopy**.—Vonsovskij, 2204.
- Densitometer** employing Alternating-Current Amplifier.—Tabor, 2184.
- Physical **Density** Comparator.—Sweet, 863.
- New Patent shows Navy's Method of detecting Flaws.—Gunn, 4790.
- Detonation**: see Cinematography.
- Wireless Section: Chairman's Address [Recent Radio-Engineering Developments].—Gill, 865 & 1778.
- Developments**: see also Progress, Research.
- Short-Wave [6, 12, & 15 m] **Diathermy** and Apparatus.—Amweg, 2613.
- Dictionaries**.—"Technical D. in Four Languages: Vol. I (English, Polish, French, German)," 3822; "Dictionnaire de Radioélec. et de Radiovision" (Duvall & others) 3824; "Internat. Electro-technical Vocabulary" (French Committee) 404/5 & 3823; Dictionary of Electrical Terms" (Roget) 403.
- Discharge**: see Air-Current, Ultra-High.
- Electro-Magnetic Measurement of Longitudinal **Displacement** of Turbine Shafts during Running.—Kelch, 840.
- Divining**: see Lightning-Nests, Radiesthesia.
- Drying** with Near Infra-Red Radiation.—Ickis & Haynes, 4266.
- Copper **Earthing** Electrodes: Demonstrations of Driving with Electric Hammer, 848.
- Eddy-Current Oven** roasts Coffee, 838.
- General Discussion on "Electrical Engineering Education," 2221.
- Technical **Educational** Requirements of the Modern Radio Industry.—Whitaker, 391.
- Electrostatic Method of Measuring **Elastic** Constants.—Bancroft & Jacobs, 353.
- Study of **Elastic** Relaxation by Resonance Method.—Mikhailov & Kirilina, 2197.
- Elasticity**: see Photoelasticity.
- Electrical Communication** in 1938, 2236.
- Electricity exists Wherever there is Life: **Electrical Field** may determine Nervous Structure.—Burr & Harnan, 4778.
- New Method of Creating **Electrification**.—Fleming, 3012.
- Electro-Culture**: Experiments with Distant Iron and Magneto Spark.—Nehru, 3399.
- Evidence for Existence of **Electrodynamical Field** in Living Organisms.—Burr & Northrop, 4777.
- Electromagnetic Induction** in Non-Uniform Conductors and Determination of Conductivity of Earth from Terrestrial Magnetic Variations.—Lahiri & Price, 2168.
- Electron Bombardment** of Biological Materials.—Cooper & others, 2605.
- Consultant talks about **Electronics** [as Profession].—McDill, 825.
- Current Articles of **Electronics** and Related Subjects [Bibliography].—Sperling, 818.
- Electronic Applications**: see Automobile, Chlorophyll, Control, Eddy Current, Gauge, Hardness, Leaks, Mill, Moisture, Motors, Periscope, Phase-Indicator, Photoelectric, Photographic, Piezo-electric, Powdered, Shells, Speed, String-Method, Surface, Temperature, Time, Torsion, Tube, Ultramicrometer, Welders, Yarn.
- Recent Continental Advances in Principles, Construction, and Use of Scientific Instruments [including **Electron Microscope**].—Pirani, 1782.
- Electron-Microscope**, **Super-Microscope**.—von Ardenne, 4273

Miscellaneous—

- (Possibility of Examination of Living Substances); Beischer, 850 (as Aid to Colloid Investigation); Kausche & others, 3390 (Vegetable Virus); Ruská, Krause, 851 (Biological Application); Pampana, 3391 (and Microbiology); Scott & Packer, 2809 (Localisation of Minerals in Tissues). See also under "Subsidiary Apparatus & Materials."
- Use of **Electron Probe** for Micromanipulations.—von Ardenne, 376.
- Electro-Optical** Effects in Colloids, and Influence of Frequency on **Electro-Optical** Effect in Colloids.—Mueller: Norton, 3018.
- Differential Pre-Amplifier for **Electrophysiological** Purposes and for Bridge Measurements.—König, 1779.
- Electrostatic**: see Elastic, Powder.
- Empire** Telegraph Communications.—Wood, 3385/6.
- Reflections on **European Telecommunication Network**.—Valensi, 402.
- Exhibitions**.—Berlin, 411, 2228/9; Leipzig, 2823; Olympia, 409/11, 827; Paris, 828, 2226/7, 2624, 3854/5; Physical Society, 2230/1, 3847; Rome, 3853. Also under "Reception."
- Polarity Potential of Human Eye.—Miles, 853.
- Precision Device for **Faradic Stimulation**.—Fender, 4779.
- "Plating" with Thin Films makes Glass More Transparent.—Cartwright & Turner: Blodgett, 2172 & 3407.
- Portable Motor-Driven Apparatus for Depositing Built-Up Molecular Films.—Gregg & Widdowson: Blodgett, 4772.
- Non-Destructive Thickness Measurement of Electrically Deposited Oxide Films on Aluminium.—Dahl: Käpernick, 4773.
- Colours of Mosaic Powder Films.—Pfund, 1776.
- Flaws**: see Defectoscopy, Detecting, Magnetic, Photoelectric-Cell.
- Novel Use of Short [Micro-] Waves for Navigation in Foggy Weather, 1323.
- Proceedings Format, 2223.
- French Imports and Exports during 1937 and First Six Months of 1938.—Reyval, 406 & 871.
- Activities of National Electrotechnical Institute "Galileo Ferraris" in Fourth Year of Its Existence.—Vallauri, 3843.
- Measuring Millionths of Inch in Gauge Room.—Cofman & Borneman, 842.
- Use of Electrical Calibrating Gauge for Measurement and Control.—Hermann, 346.
- Gauges**: see also Length, Strain.
- Value of Applied Radio-Geology for Science and Engineering.—Fritsch, 2614.
- Electronic Engineering in **Geophysics** [Seismic Method].—McCullough, 4794.
- Geophysical**: see also Prospecting, Radiesthesis.
- German Electrical Foreign Trade Data, 1938, 407 & 870.
- Glass: see Film.
- History of G.P.O. Engineering Department.—Baker, 3844.
- Ground Investigation using Electromagnetic Waves.—Standard Oil, 386.
- Surface **Hardening** of Steel by Heating by High-Frequency Currents.—Babat & Losinsky, 839.
- Surface **Hardening** by High-Frequency Currents.—Wologdin [Vologdin], 355.
- Measurement of **Hardness** of Synthetic-Resin Moulding Materials.—Erk & Holzmueller, 352.
- Electrically-Operated **Hardness-Testing** Instrument for Foils and Very Thin Metals.—Salford Instruments, 3399.
- Heinrich Rudolph Hertz: Fifty Years After, 1764.
- Bodies **Hovering** Freely in Electric and Magnetic Field and Free **Hovering** of Diamagnetic Bodies in Magnetic Field.—Braunbek, 4267.
- Hovering**: see also Levitator.
- Death of Ross A. Hull, 802.
- Electrometrical Methods of Measuring **Humidity** of Disperse Bodies [e.g. Soil].—Alexandrov & Mikhailov, 1324 & 2169.
- Determination of Low **Humidity** with Dew-Point Potentiometer.—Frank, 361.
- Humidity**: see also Moisture.
- Terminology and Standards of **Illumination**, and Basic Principles in **Illumination** Calculations.—Crittenden: Moon, 3410.
- Illumination** Density of Black Body (Preparatory Measurements for New Unit of Light).—Willenberg, 4800.
- Image**: see Photography.
- Investigations on **Incandescent** Lamps using Alternating Current.—Leo, 2193.
- Transparent and Opaque Screens for Near **Infra-Red**.—Pfund, 2173.
- Supersonic Dispersion and **Infra-Red** Radiation.—Richardson, 3020.
- Effects of Radiations on Pyroelectric Crystals: Possibility of Utilisation as Detectors of **Infra-Red** Radiations.—Ta, 1319.
- Infra-Red**: see also Drying, Lenses, Thermometry.
- Professional Status for Radio Engineer: Activities of Institute of **Wireless Technology**, 3817.
- Resonant Shunts: Use for Elimination of Arc Rectifier **Interference** on South African Railways.—Funke, 374.
- Inductive **Interference** between Urban Power Distribution and Communication Circuits.—Noda & Nishiyama, 1326.
- Test on Inductive **Interference** with Experimental Lines.—Sato & Nishiyama, 373.
- Comments on Recommendations of **International Electrotechnical Commission** concerning Radio Apparatus in Common Use.—Zilitinkevich, 815.
- Classification of **Inventive Ideas**.—Wyman, 389.
- Digest of Technical Papers at Rochester Fall Meeting, **IRE-RMA**, 2216.
- IRE** Pacific Coast Convention, San Francisco, June 1939: Summaries, 3857.
- Italian** Contribution to Researches in Physics for the Year 1936/1937, and Report on Physical Studies in Italy during 1938.—Dalla Nöce, 3849.
- Journals** for Electrical Engineers.—Roehmann: Dalziel, 393.
- Journals**: see also Bibliography.
- In Memoriam: Arthur B. Kennelly, 4251.
- Engineering and the Law.—Appleton, 869.
- Olfactory Electricity [spotting Gas Leaks], 4260.
- Electrical Measurement of Small Differences in Length.—Froböse & Schönbacher, 3404.
- Length**: see also Ultramicrometer.
- Lithium-Fluoride/Quartz Achromatic Lenses.—Stockbarger & Cartwright, 2174.
- Electromagnetic Levitator.—Bedford, Peer, & Tonks, 4268. See also Hovering.
- Rôle of Engineering Library.—Naeter: Craver, 392.
- Application of Polycascade Secondary-Electron Multipliers to Measurement of Low Intensity Light.—Dobrolubskij, 2189.
- Present Problems of Light Measurement.—Dressler, 2188.
- New Method of Observing Standard Light Waves.—Jäger, 2192.
- Photoelectric Null Indicator for Matching Light Intensities.—Kniazuk, 3870.
- "Piped" Light New Tool for Operating Room.—du Pont de Nemours, 2171.
- Light**: see also Black-Body, Illumination, Photometry.
- Tracing of Lightning "Nests" by Divining-Rod Expert.—Fritsch, 1317.
- Modern High-Frequency Transmission over High-Tension Lines.—Dressler, 372.
- Disturbances arising in Communication Lines from Crossing of Transmission Lines.—Miroslubov, 2242.
- Telephony, Printing Telegraphy, and Television over Lines.—Strecker, 2243.
- Lines**: see also Interference, Transmission of Energy.
- New Series of "Literaturkartei Elektrotechnik."—VDE, 396.
- Luminescence**: see Triboluminescence.
- Survey of Magnetic Powder Methods of Testing Materials and Machine Parts.—Müller, 2205.
- Magnetic**: see also Defectoscopy, Electromagnetic-Induction, Hovering, Levitator.
- Automatic Measurement of Small Mechanical Shifts by Induction Method.—Zacktreger, 347.
- Medical Use of Short [and Ultra-Short] Waves.—Theile, 3387.
- Medical: see also Biological, Supersonic.
- New Apparatus for Photographic Reproduction: "Omniphoto-Microfilm."—Lézy, 3820.
- Papers on Utilisation of Microfilms in Scientific Research.—Seidell: Dice, 3415.
- Electronic Micrometers.—Tugami & Kato, 1325.
- Micrometric Measurements with Electric Waves.—Hardung, 4774.
- New Microphotometer for Evaluation of Acoustic Records.—Narath & Schwarz, 2185.
- Double Refraction of Micro-Waves in Oak.—Lindman, 2806.
- Micro-Waves**: see also Biological, Foggy, Ultra-Short.
- Electric Ear controls Grinding Mill, 3401.
- Radio Reception Tests in Some Mines in Austria.—Fritsch, 387.
- Contribution to Foundations of Radio Mining Prospecting by "Antenna Equivalent-Capacity" Method.—Fritsch & Wiechowski, 3017.
- Investigations in Near Field of Mirror for Ultra-Short Waves.—Bach, 3388.
- Moisture Meter.—Marconi-Ekko, 2208.
- Siemens Moisture-Meter for Timber.—Pflfer, 359.
- Moisture Alarm: New Commercial Instrument for Automatically Sorting Timber.—Thomas & Greenhill, 360.
- Moisture: see also Humidity.
- Measurement of Starting Moment of Asynchronous Motors by New Electrostatic Method.—Kluge & Linck, 351.
- Electronic Control Circuits for D.C. Motors.—Ryder, 1788.
- Museum of Electronic Apparatus.—Weston, 826.
- Radio Publications of National Bureau of Standards: List since 1923, 398.
- Electrodeless Neon Tubes excited by Radio-Frequency Energy, 846.
- Nerve Conduction with Distributed Capacitance.—Weinberg, 2612 & 3389.
- Communications on Technique of News Distribution.—Feldtkeller, 399.
- Work of G. S. Ohm in Light of Present-Day Technique, 3846.
- Oil: see Ground.
- Opacimeter used in Chemical Analysis.—Eavens & Silberstein, 4806.
- Position in Optical Telephony.—Kohler, 835 & 4771.

Miscellaneous—

- Optical Telephony** : see also Incandescent, Infra-Red, Tungsten. Radio-Wave Absorption as Means of Investigation into Modern **Organic Structure**.—Cavallaro, 4272.
- Abstracts of Some Recent Marconi Patents**, 3839.
- Foreign Patents and Currency Law** : Important New Developments for Exporting Manufacturers of Telephone Apparatus, 3816.
- Patent-Law Protection for German Equipments and Apparatus in Foreign Countries**.—Barth, 2225.
- Judiciary Axioms** : Old Principles, Recent Applications [in Patent Law, etc.].—Fernaund-Jacq, 390.
- Patents for Acts of Nature**.—Ruby, 3815.
- Evaluation of Technical Periodicals**.—Lancaster-Jones, 2224.
- Periodicals** : see also AEG-Research, Forinat, Journals, Library.
- Electronic Periscope for Vision in Fog**.—Del Vecchio, 3867.
- Permatron and Application in Industry**.—Overbeck : Spencer, 3818.
- Physics in Pharmacy**.—McFarlan, 849.
- Electronic Phase Indicator for Electrical Balancing Machines**.—Marlow, 3403.
- Survey of Crystal Optics (with Emphasis on Parts finding application in Photoelasticity)**.—Valasek, 3406.
- New Method for Photoelasticity in Three Dimensions**.—Weller, 4786.
- "Photoelectric Cell Applications"** [Book Review].—Walker & Lance, 864.
- Photoelectric-Cell Applications**.—Colour-Matching in Paper Industry, 1331 ; Spectrophotometer in Printing Industry, 1330 ; Counting Beer Cases & Kegs, 1335 ; Ship's Compass, 3866 ; Quick Fluctuations of Rotational Speeds, 3013 ; Position Regulator for Paper Slitters, 1329 ; Traffic-Safety Aid, 2179 ; Scans Steel Strip for Flaws, 2182 ; Optimum Thickness of Protective Coatings, 2178 ; Guards Ballot Boxes, 2183 ; Indicates Softness of Water, 865 ; Improves Stroboscopic Measurement of Slip and Revolutions, 860 ; Timing Devices, including Photographic Exposure, 358, 858 & 3871 ; Recording Analytical Balance, 859 ; Testing Highway "Catseyes," 2180 ; Controls Machine Tools, 4804 ; Tests Electricity Meters, 3865 ; Controls Air-Brush in Giant Poster Making, 3869 ; Detects Mercury Vapour, 2181 ; Conveyor Control, 2176 ; Furnace Control in Steel Production, 2175 ; Tests : Agricultural Soils, 857 ; Measures Fineness of Powders, 861 ; Counts, Sorts, Controls Tedious Operations, 3408 ; Counters & Their Applications, & Detection of Very Small Powers, 855 ; Method of Dimensional Gauging, 4805 ; See also Colorimeter, Densitometer, Density, Light, Pharmacy, Photometry, Spectro-, Temperature.
- Experimental Results obtained by Photoelectronic Photography**.—Lallemand, 3019.
- Tube aids Photographic Analysis [e.g. of Golf Swing]**, 2177.
- Simple and Important Photographic Method of Copying at Nominal Cost**.—Boydston, 397.
- Simple Method of making Photographic Copies**.—Distad, 3414.
- Criteria for Appraisal, Comparison, and Measurement of Grain and Resolving Power of Photographic Emulsions**.—Ronchi : Bruscazioni, 1320.
- Possibility of recording Images in Shorter Time than by Photography**.—Lallemand, 3859.
- Orientalizing Protractor for Aerial-Survey Photography with D.F. Auto Pilot**.—Willis, 364.
- Photography** : see also Cinematography, Microfilm, Photoelectric-Cell, Photoelectronic, Thermometry.
- Photometry**.—Boutry & Gilled, 4274 (Photoemissive Cell for High Precision) ; Mehlin, 1334 (Projection P. for Measurement of Stellar Magnitudes from Photographs) ; Moon & Severance, 2187 (Radiation-Mixing Enclosures) ; Stewart & O'Brien, 3864 (Properties of Photronic Cells affecting P.) ; Terrien, 4801 (Selenium Cell for Precision P.) ; Vosinski, 4802 (P. with Spherical Revolving Knob for Objective Measurements) ; Wilson, 2186 (Simple Photox P. Head using Single Cell). See also Colorimeters, Illumination, Light, Microphotometer, Opacimeter, Spectro-, Ultra-Violet.
- Increasing Sensitivity of Phototube Relay**.—Sturtevant, 856.
- Session of Physical Section of Academy of Sciences of the USSR**.—Somninskij, 2239.
- Work of Physikalisches-Technische Reichsanstalt in 1938**, 3842.
- German "Physikertag"** in Baden-Baden, 1938.—Lübcke, 2238.
- Piezoelectric Measurement of Impact of Hammer on Stretched String**.—Davy & others, 1784.
- Piezoelectric Measurements on Free-Jet Turbine**.—Eilken, 4791.
- Piezoelectric** : see also Pressure, Rochelle-Salt, Ultracentrifuge.
- Polyelectrophysiograph** : Instrument for Teaching and Research in Biological Sciences.—Huddleston & Whitehead, 377.
- Electrostatic Separation on Fine-Powder Mixtures**.—Johnson, 354.
- Application of Electrical Measuring Methods to Degree of Fineness of Powdered Materials**.—Lépingle, 4271.
- Radio Industry uses "Preferred Numbers"**.—Van Dyck, 813.
- Cathode-Ray-Oscillograph Auxiliary Pressure Recording Apparatus**.—Cossor, 843.
- Electrical Indicator for Pressure, Stress, and Movement**.—Southern Instruments, 1785 & 2195.
- Experiences with Electrical Pressure-Recording on Heat Engines**.—Watzinger & Larsen, 4792.
- Pressure** : see also Cathode-Ray, Cinematography, Piezoelectric.
- Reviews of Progress** : Broadcasting and Television.—Ashbridge, 2232.
- Wireless Communications [Progress in 1938]**.—Chetwode Crawley, 2234.
- Reviews of Progress** : Telephony and Telegraphy ; Radio Telegraphy and Radio-Telephone.—Radley : Rickard, 2233.
- The Art Advances [Progress in Valves, Components, Equipment, Technique]**, 3858.
- Progress** : see also Annual-Review, Developments, Electrical-Communication, Review.
- Projectiles** : see Chronograph, Shells.
- High-Frequency Prospecting**.—Heine, 847.
- Prospecting** : see Geology, Geophysics, Ground, Lightning-Nests, Mines, Mining, Rocks.
- Meter and Instrument Section: Chairman's Address [Protective Devices for Telecommunication]**.—Cohen, 2240.
- Absolute Output of Radiation caused by Electrons moving within Medium with Super-Light Velocity, and Spatial Distribution of Visible Radiation produced by Fast Electrons**.—Cerenkov, 3395.
- Cerenkov Radiation**.—Collins & Keating, 375.
- "Secret of Life: Cosmic Rays and Radiations of Living Beings"** [Book Review].—Lakhovsky, 2617.
- Contribution to Study of Ionising Radiation emitted by Ordinary Metals**.—Reboul, 3394.
- Ultra-Violet Radiation of Crystals under Action of Gamma Rays**.—Zavadovskaya, 3396.
- Radiation** : see also Black-Body.
- Radiesthesis** ; Survey of mainly French Research in Methods of Divining.—Macbeth : Turenne, 1318 & 2616.
- Radiesthesis in Medicine**.—Maury, 2615.
- Detection of Radioactive Contamination, using Geiger-Müller Counters**.—Curtiss, 4785.
- Concerning Radioactive Phenomena of Second Order**.—Reboul : Eichenberger, 4780.
- History of Radioelectric Industry**.—Bethenod, 3838.
- Second National Congress of Radiophonic Art, Paris, 1939**, 3856.
- Report to Commission V on Radio Physics**.—van der Pol, 4810.
- Application of Ultra-Short-Wave Power to Radiothermy [Estimation of Power by the "Double-Element" Method]**.—Awaya & Emi, 4782.
- Applications of Copper-Oxide Rectifiers**.—Morris, 3398.
- Dispersion and Relaxation**.—Wirtz, 868.
- Relay Circuits** : see Automobile, Control, Permatron, Phototube-Relay.
- Remote Control** : see Control.
- Governmental Support of Research in France**, 866.
- Reprints of Articles on Applied Scientific Research**, 3413.
- Federal Government and Research**.—Potter, 3848.
- Importance of Research and Development in maintaining Technical Progress**.—Smith, 867.
- National Office of Scientific and Industrial Research and Inventions** : Creation, Results, and Suppression, 388.
- Research** : see also AEG, Apparatus, Book-Review, Galileo-Ferraris, Italian, Nat. Bureau of Stds., Physical, Physikalisches.
- Resolving Power** : see Photographic.
- Review of 1937** : Radiocommunications, 401.
- Rochelle-Salt Vibration Meter**.—Hellmann, 2196.
- High-Frequency Characteristics of Rocks**.—Kadowaki, 4793.
- Electrical Imports of Roumania, Jugoslavia, and Bulgaria**, 408.
- Safety** : see Trains.
- [Anti-Aircraft] Shells that Burst when They "See" Target**.—Bofors Ordnance, 2627.
- Resuscitation from Electrical Shock**.—De Soto, 1781 & 3016.
- Spectrochemical Analysis**.—Ruehle, Clarke, 383 & 3412.
- Papers on General Electric Recording Spectrophotometer, including Use in Printing Industry**.—Hardy, Michaelson, & others, 1330.
- Spectrophotometry of Reflecting Materials**.—Donaldson, 3409.
- Spectroradiography with Cathode-Ray Tube**.—Graham & Müller, 4788.
- Automatic Recording Spectroradiometer for Cathodoluminescent Materials**.—Zworykin, 2190.
- Spectroscopy in Region of Radio Frequency**.—Kellogg & Others, 4787.
- Spectrum Analysis** : Radio Wave Absorption and Study of Binary Systems.—Cavallaro, 384.
- Stroboscopic Device for determining Speed of Mechanisms**.—Lauer, 3014.
- Combined Thyatron and Tachometer Speed Control of Small Motors**.—Williams, 844.
- Method for indicating Speeds of Rotation**.—Morris & Silver, 3015.
- Speeds** : see also Photoelectric-Cell.
- "Standards on Electronics—1938"** [Book Notice].—IRE, 814.
- Sterilisation by Ultra-Violet Radiation**.—Hibben & Blackburn, 854.
- Stethophone Amplifier**.—Singer, 4784.
- Electric Strain Gauge**.—Rusher & others, 841 & 4789.

Miscellaneous—

- String Method and Erection of Palace of the Soviets.**—Davidenkov, 4261.
- Stroboscopic** : see Speed, Strobotron.
- Strobotron as Electron Control Unit.**—Schulman, 1787.
- Utilising Heat from Sun.**—Abbot, 4768.
- Super-Microscope** : see Electron-Microscope.
- Supersonic Waves in Service of Medicine.**—Fehr, 2618.
- Absorption of Supersonic Waves in Human Tissue and Its Dependence on Frequency.**—Pohlman, 2619.
- Supersonic** : see Infra-Red.
- Surface State of Mechanical Parts : Methods of Measuring Roughness, including Perthen's Electrical Integration.** 2210.
- Instrument for Measuring Surface Roughness.**—Physicists Research, 4776.
- Use of Capacity-Measuring Process for Testing of Smoothness of Metallic and Non-Metallic Surfaces.**—Sachsberg & Perthen, 1786.
- Surface Indicator.**—Sams, 4775.
- Surface** : see also Hardening.
- Position and Trends of Development in Switzerland of Communication Engineering.** 4812.
- Quadrature Tachometer.**—Brown, 3402.
- General Municipal Service Tele-Control.**—Lakhtin, 371.
- Note-Frequency Channels for Telemetering and Telecontrol Installations.**—Kleinschnitz & Kummert, 3852.
- Why Telemetering ? Fields of Service : Types of Equipment & Selection : etc.**—Lunge, 3851.
- Remote Transmission of Instrument Readings [Pneumatic Telemetering].**—Moore, 832.
- New Telemetering Devices.**—Pelpel, 2241.
- Telemetering by Amplitude-Modulation Method.**—Tomituka, 2622.
- Theory and Design of Telemetering Systems.**—Zukerman, 369 & 834
- Telemetering, etc** : see also Carrier-Current, Control.
- Telesurgery [Television between Operating Table and Lecture Room].** 3880.
- Television Technique** : see Cardiograph, Cathode-Ray, Telesurgery, Time-Measuring.
- Induction Pick-Up regulates Temperature directly from Indicator Pointer.** 845.
- Electrical Temperature Measurements in Physiology.**—Hill, 4781.
- Making Visible of Temperature Fields by Temperature-Dependent Colour Paints.**—Penzig, 2170.
- Elaborate Temperature-Monitoring Equipment installed in New Alloy Furnace.**—Westinghouse, 357.
- Temperature** : see also Thermometry.
- Terminology** : see Tubes.
- Non-Destructive Testing in U.S.A.**—Lester, Sanford, & Mochel, 1783.
- Discussion on "Non-Destructive Testing" with Introductory Papers.** 3405.
- Photo Thermometry with Infra-Red Rays.**—Neubert & Henchy, 3819.
- Practical Measurement of Wall Thickness by X-Rays and Counter Tube.**—Trost, 348.
- Measurement of Thickness of Metal Plates from One Side.**—Warren, 2209.
- Thickness** : see also Films, Ultra-Micrometer.
- Elihu Thomson** : Electrical Engineer, 3814.
- Thyratron** : see Motors.
- Indicating Arrangement for Short-Time Measuring Apparatus based on Television Exploring-Ray Scanning.**—Winckel, 4262.
- Time** : see Chronograph.
- Electrical Torsion Meters.**—Merz & Scharwächter, 1789.
- Safety Device signalling Passage of Trains, S.F.R. System.** 4258.
- Transmission of Energy over Long Distances with "Half-Wave" Frequency.**—Leonhard, 1777.
- Experimental Investigations on Triboluminescence and Crystal-luminescence.**—Inoue, Tuda, & others, 3397.
- Tube Equipment in Industry.** 2212.
- Industrial Tube Terminology.**—Gen. Elec. & Westinghouse, 368.
- Indexed Bibliography of Electron Tubes and Their Applications.**—McArthur, 367.
- Non-Radio Application of Radio Tubes.**—Starrett, 366.
- Temperature Fluctuations of Tungsten Filaments heated by Alternating Current.**—Elenbaas, 836.
- Turbine** : see Displacement, Piezoelectric.
- Electrically-Driven Magnetically-Supported Vacuum-Type Ultracentrifuge.**—Beams & Black, 2213.
- Ultra-High-Frequency Discharges on Heat-Resisting Insulators.**—Okabe & Seya, 4769.
- Ultra-Micrometer** : see Displacement, Elastic, Gauge, Hardness, Length, Mechanical-Shifts, Micrometer, Motors, Pressure, Strain, Surface, Temperature, Torsion, Vibration.
- Progress in Technique of Ultra-Short Waves.**—Ponte, 2607.
- Ultra-Short, -High** : see also Absorbed, Biological, Colloidal, Diathermy, Medical, Micro-Waves, Mirror, Organic-Structure, Radiotherapy, Rocks, Spectrum-Analysis.
- Integrating Meters for Ultra-Violet Radiation, and Observations with New Radiation Pyrometer.**—Kuper & Brackett : Strong, 3863.
- Pocke Size Ultra-Violet Meter.**—Taylor, 3411.
- Ultra-Violet** : see also Light, Radiation, Sterilisation.
- Multi-Electrode Valve and Application in Scientific Instruments.**—Lewis, 831.
- Valves** : see Electronic-Applications, Tubes.
- VDE Meeting in Cologne.** 395.
- Investigations for Construction of Suitable Vibration Meters for Motor Cars and Aircraft.**—Meister, 349.
- Study of Vibration of Lathe.**—Tanaka, 1327.
- Vibrations** : see also Cathode-Ray, Rochelle-Salt, Vibrometer.
- Moving-Coil Vibrometer.**—Eccles, 350.
- Diaphragm of Vibrometer for Submarine Acoustical Measurements.**—Hayasaka, 2620.
- Magneto-Electric Viscometer.**—Martens, 2214.
- Effect of Electric Field on Viscosity of Liquids.**—Andrade & Dodd, 1775.
- Vision in Nature and Vision Aided by Science.**—Rayleigh, 365.
- Electronic Control Circuit for Resistance Welders.**—Gray & Breyer, 4796.
- New Arc-Stabiliser for Welding.**—Fukuda & Hoh, 2199.
- Whaling and Wireless [Use of Direction Finding].** 2626 & 4795.
- Technics of Wireless Waves and Their Boundaries [Lecture].**—Hahnemann, 4813.
- World Radio Convention Papers.** 2237.
- X-Ray Equipment for Exposures of 1/100th Second using Condenser-Charging and Discharging Circuit.** 2201.
- X-Ray Cinematography with Low-Power Tubes.**—Geller, 2202.
- Generator of X-Ray Flashes of 1/1000th Second for Regmography and Serigraphy, and Regmography.**—Gilardoni, 4265.
- Papers on Macroscopic Examination of Materials with X-Rays.**—de Graaf & others, 381/2 & 2200.
- Increase of X-Ray Reflection from Quartz due to Strong Electric Field.**—Kakiuchi, 837.
- Heat Transmission through Anode of X-Ray Tube.**—Nieuerkerke, 4809.
- X-Rays** : see also Amplifier, Pharmacy, Thickness.
- Nunan Yarn Tester.** 2211.

