



#G1011

2763

# NATURE

A WEEKLY JOURNAL OF SCIENCE

*"To the solid ground  
Of nature trusts the Mind that builds for aye"*—WORDSWORTH

1944 - 3872, 3874, 3876-3895

Volume 153

JANUARY 1, 1944, to JUNE 24, 1944

back Nr. 3870  
3871  
3873  
3875

LONDON  
MACMILLAN AND CO., LTD.  
NEW YORK: THE MACMILLAN COMPANY

## DATES and PAGINATION of WEEKLY ISSUES

<i>Serial No.</i>	<i>Date of Issue</i>	<i>Pagination</i>
3870 ...	January 1 ...	1-34
3871 ...	„ 8 ...	35-62
3872 ...	„ 15 ...	63-90
3873 ...	„ 22 ...	91-118
3874 ...	„ 29 ...	119-146
3875 ...	February 5 ...	147-174
3876 ...	„ 12 ...	175-202
3877 ...	„ 19 ...	203-230
3878 ...	„ 26 ...	231-264
3879 ...	March 4 ...	265-292
3880 ...	„ 11 ...	293-324
3881 ...	„ 18 ...	325-352
3882 ...	„ 25 ...	353-386
3883 ...	April 1 ...	387-414
3884 ...	„ 8 ...	415-442
3885 ...	„ 15 ...	443-470
3886 ...	„ 22 ...	471-504
3887 ...	„ 29 ...	505-538
3888 ...	May 6 ...	539-566
3889 ...	„ 13 ...	567-600
3890 ...	„ 20 ...	601-628
3891 ...	„ 27 ...	629-662
3892 ...	June 3 ...	663-690
3893 ...	„ 10 ...	691-724
3894 ...	„ 17 ...	725-752
3895 ...	„ 24 ...	753-786

**BIBLIOTEKA**  
**Instytutów Chemicznych**  
**Uniwersytetu i Politechniki**  
**we WROCŁAWIU**

Nr. Zw. 2166.

# INDEX

## NAME INDEX

- ABBOTT**, Joseph F. : Aims of the Sugar Research Foundation, 18
- Abel**, Dr. Paul : Patent Law and Procedure in Austria, 716
- Abere, J.**, and others : High Polymers, *review*, 665
- Academia Sinica** : Research Activities of the National Institute of Zoology and Botany during 1943, 410
- Ackerman**, Lloyd : Health and Hygiene, *review*, 635
- Acree, S. F.** (Bates, R. G., Stegel, G. L., and) : Thermodynamic Second Dissociation Constant  $K_2$  of *para*-Phenol Sulphonic Acid, 532
- Acree, S. F.** (Sager, E. E., Schooley, M. R., and) : Potassium *para*-Phenol-sulphonate as a Buffer, 532
- Adamson, A. M.** : Termites and Soil Fertility, 531
- Adelman**, Prof. Howard B. : The Embryological Treatises of Hieronymus Fabricius of Acquapendente, *review* by Prof. F. J. Cole, 149
- Adler**, Prof. S., and Tchernomoretz, I. : Development of Gametocytes from Extraerythrocytic Forms in *Plasmodium gallinaceum*, 83
- Adrian**, Prof. E. D. : Brain Rhythms, 360
- Aeronautical Society**, Royal : Election of Group Captain F. Whittle as a fellow, 135
- African (West) Governments** : Maxwell Fry appointed town-planning adviser to the, 18
- Agricultural Education Association** : Half-yearly Conference, 116
- Agricultural Research Council** : Appointment of J. C. F. Fryer as secretary, 767
- Agricultural Research Institute of Northern Ireland** : Sixteenth Annual Report, 78
- Agriculture and Fisheries, Ministry of** : J. Morgan Jones appointed Welsh Secretary, 18
- Agricultural Scholarships**, 431
- Report on Fungus, Bacterial and other Diseases of Crops in England and Wales for the Years 1933-1942** (Bulletin No. 126), *review* by Dr. John Grainger, 447
- Atken**, Dr. Robert : The Planetary Companion of 61 Cygni, 491
- Aiya, S. V.** Chandrashekar : Banded Meson Spectrum and the Rossi Second Maximum, 375
- Albert, Dr. Adrian**, Falk, John E., and Rubbo, Sydney D. : Antibacterial Action of Arsenic, 712
- Albert, Dr. Adrian**, and Goldacre, Reginald : Basicities of the Aminoquinolines—Comparison with the Aminoacidines and Aminopyridines, 467
- Aldis, A. C. W.** : Stereoscopic Projection, 767
- Alexander**, William (Street, Arthur, and) : Metals in the Service of Man, *review* by Dr. S. W. Smith, 634
- Alfvén, H.** : Constitution of the Solar Corona, 59
- Allan, Dr. Douglas A.** : Awarded the Neill Prize of the Royal Society of Edinburgh for the period 1941-43, 431
- Allen, Dr. C. W.** : Relation between Magnetic Storms and Solar Activity, 452
- Allen, L. A.** : Spore-forming Bacteria causing Soft Rot of Potato and Retting of Flax, 224
- Allen, Dr. P.** : Statistics in Sedimentary Petrology, 71
- Alvarez, Dr. A.**, and Mercado, Dr. M. (Ginés, Dr. A. R.) : Tuberculosis in Paraguay, 248
- Amateur Entomologists' Society** : Directory of Natural History Societies, 161
- American Academy of Arts and Sciences** : Grants of the, 403
- American Association for the Advancement of Science** : Prof. Anton J. Carlson elected president, 282
- Annual Meeting for 1944** to be held at Cleveland, Ohio, during September 11-16, 708
- American Association of Physical Anthropologists** : Dr. R. E. G. Armattoo elected a foreign member, 741
- American Astronomical Society** : Election of Sir Harold Spencer Jones as an honorary member, 193
- Annie J. Cannon Prize** awarded to Miss Antonia C. Maury, 220
- Monthly Newsletter** (Bart J. Bok), 770
- American Chemical Society** : Prof. C. S. Marvel elected president for 1945, 134
- (Chicago Section of the) : Willard Gibbs Medal for 1944 awarded to Dr. George O. Curme, jun., 400
- (New York Section of the) : William H. Nichols Medal for 1944 awarded to Prof. C. S. Marvel, 135, 533
- (Western New York Section of the) : Jacob F. Schoellkopf Medal for 1944 awarded to G. D. Bagley, 614
- American Geographical Society** : Charles P. Daly Medal awarded to Sir Halford Mackinder, 431
- Cullum Medal** awarded to Arthur R. Hinks, 431
- American Institute of Electrical Engineers** : Edison Medal for 1943 awarded to Dr. Vannevar Bush, 282
- American Philosophical Society** : Correction to a statement in a review on page 207, 554
- American Society of Mechanical Engineers** : Holly Medal awarded to Dr. Vannevar Bush, 282
- Andean Research, Institute of** : Cross Sections of New World Prehistory, a Brief Report on the Work of the, 1941-42 (Prof. Wm. Duncan Strong), 708
- Anderson, Dr. D. S.** : Technical Education of the Future, 561
- Andrade**, Prof. E. N. da C. : Newton's Verses, 105
- Simple Sensitive Flames**, 498
- Elected president of the Physical Society for 1944-45, 708
- Anglo-American Caribbean Commission** : Report to the Governments of the United States and Great Britain for the Years 1942-1943, 320
- Anglo-Saxon Petroleum Company** : Scholarship tenable in the Mining Department of the University of Leeds, 649
- Animal Behaviour, Institute for the Study of** : Report of a meeting held on April 20, 646
- Animal Production** : British Society of (Alastair N. Worden), 172
- Appleton, Sir Edward** : Fundamental Scientific Research and its Practical Importance, 520
- Architects (Naval)**, Institution of : Premium for 1943 awarded to Dr. J. F. C. Conn, 220
- To administer a research scholarship offered by the Wrought Light Alloys Development Association, 220
- Armattoo, Dr. R. E. G.** : Elected a foreign member of the American Association of Physical Anthropologists, 741
- Armitage, Miss Eleonora** : Annual Reports of the Moss Exchange Club and the British Bryological Society, 768
- Armstrong, Edward A.** : White Plumage of Sea-Birds, 527
- Armstrong, Dr. E. F.** : Appointed chairman of a commission appointed by the Conference of Allied Ministers of Education on the supply of Scientific Instruments to the Occupied Countries, 220
- Arts, Royal Society of** : Albert Gold Medal awarded to Sir Henry Tizard, 679
- Aruja, Dr. E.** : X-ray Analysis in Industry, 534
- Ashworth, D.** (Hickman, C. J., and) : Botrytis spp. on Onion Leaves, 466
- Asiatic Society, Royal** : Gold Medal awarded to Sir John Marshall, 522
- Asiatic Society of Bengal, Royal** : P. N. Bose Memorial Medal for 1943 awarded to Sir Lewis Fernald, 617
- ASLIB** : Lectures on Special Librarianship, 163
- To publish a British Union Catalogue of Periodicals, 490
- Asplin, F. D.** : Treatment of a Virus Disease of Chickens with Sulphonamides, 253
- Astronomical Institute of Sciences of the U.S.S.R.** : Ephemerides for the Determination of Time Corrections by Equal Altitudes (Zinger's Method) for 1941, 29
- Astronomical Society, Royal** : George Darwin Lecture (Prof. Svein Rosse-land), 261
- Dr. Otto Struve awarded the Gold Medal, 340
- Election of officers, 492
- Astbury, Dr. W. T.** : X-ray Analysis in Industry, 533
- Athenaeum** : Election of Prof. Niels Bohr as a member, 105
- Election of Prof. C. H. Best and T. Whittemore as members, 340
- Atkins, Daphne** : Classification of Lamellibranchiata, 318
- Auber, Dr. Ludwig**, and Raymond, J. E. G. : Water Contents of Last-stage Larvæ, Pupæ and Adults of the Meal Moth, 314
- Auluck, F. C.**, and Kothari, Prof. D. S. : The Hole Theory of Liquids, 777
- Avery, Dr. O. T.** : Elected to an honorary life membership of the New York Academy of Sciences, 163
- Elected a foreign member of the Royal Society, 770
- BACKER**, Dr. S. M. de : The Four-Colour Problem, 710
- Bacsich, Dr. P.**, and Wyburn, Dr. G. M. : Behavioural Changes in Spayed Female Guinea Pigs after Stilboestrol Administration, 346
- Bacteriologists (Agricultural)**, Society of : Annual Conference, 86
- Baddar, Dr. Fawzy Ghali** : Dealkylation of Phenolic Ethers, 377
- Baddley, J.**, Lythgoe, B., and Todd, A. R. : Synthesis of Adenine, 59
- Baden-Powell, D. F. W.** : High-Angle Edge Flaking of Flint, 227
- Baekeland, Dr. L. H.** : Death of, 488 ; *obituary*, 369
- Bagley, G. D.** : Awarded the Jacob F. Schoellkopf Medal for 1944 by the Western New York Section of the American Chemical Society, 614 ; work of, 614
- Bagnold, Brigadier R. A.** : Elected a fellow of the Royal Society, 370
- Bailey, Dr. E. B.** : The Geology of Rhum, 351
- Bailey, Hamilton** : Transfusion into the Bone Marrow, 258
- Baker, A. H.**, and Twort, C. C. (White, L. J.) : Aerial Disinfection, 141
- Baker, E. C. Stuart** : Death of, 488 ; *obituary* by Dr. W. L. Slater, 580
- Baker, Dr. J. N. L.** : Early Spanish Possessions of the New World and Far East, *review*, 299
- America a Century Ago**, *review*, 695
- Baker, John R.** : Free Border of Intestinal Cells, 113
- Baker, W. O.**, and others : High Polymers, *review*, 665
- Bakker, Dr. Tj.** : Improvement of Livestock, 117
- Bal, Ras Bahadur Dr. D. V.** : Food Production in India, 750
- Banerjee, Prof. K.**, and Bose, C. R. : Secondary Non-Laue Reflexions from Phloroglucine Dihydrate, 23
- Banerjee, Dr. Sachchidananda** : Relation of Scurvy to Histological Changes in the Pancreas, 344
- Effect of Vitamin C on the Adrenaline Content of the Adrenal Glands of Guinea Pigs, 526
- Banerji, Prof. A. C.** : Non-Solar Planetary Systems, 779
- Bannister, L. C.** : Influence of an Adsorbed (Inner) Layer on the Cohesion of a Solid, 315
- Barber, H. N.**, and Callan, H. G. : Distribution of Nucleic Acid in the Cell, 109
- Barbier, Daniel**, Chalonge, Daniel, and Vigroux, Ernest : Lunar Eclipses and the Earth's Atmosphere, 708
- Bardhan, Tyagi and Boutros, Drs.** : Control of Typhus, 537
- Barker, G. R.**, and Jordan, D. O. (Gulland, Prof. J. Masson) : Structure of Nucleic Acid in the Dividing Cell, 20
- Terminology of Nucleic Acids, 194
- Barnes, Alfred S.** : High-Angle Edge Flaking of Flint, 226
- Barnes, Dr. B.** : Inter-relations of Plants and Insects, 426
- Barnes, Winston H. F.** : Is the Mind a Calculating Machine?, *review*, 605
- Barron, Dr. H.**, Dean, J. N., and Scott, T. R. : Thermoplastic Electric Cables, 248

- Barron, N. S., and Mawson, C. A. (Benesch, R.): Carbonic Anhydrase, Sulphonamides and Shell Formation in the Domestic Fowl, 138
- Barton-Wright, Dr. E. C.: Degree of D.Sc. of the University of London conferred on, 282
- Barton-Wright, Dr. E. C., Booth, R. G., and Pringle, W. J. S.: Analysis of Barley from King Tutankhamen's Tomb, 288
- Barton-Wright, Dr. E. C., Emery, W. B., and Robinson, F. A.: New Components of the Vitamin B Complex, 771
- Bartram (William) of Philadelphia, Naturalist and Traveller (Francis Harper), 648
- Bastick, R. E., and Wheat, W. N. (Hampton, Dr. W. M.): New Types of Optical Glass, 283
- Bateman, A. J.: Specific Differences in Petunia, 661
- Bates, R. G., Siegel, G. L., and Acree, S. F.: Thermodynamic Second Dissociation Constant  $K_2$  of *para*-Phenol Sulphonic Acid, 532
- Bauer, S. H., Finlay, G. R., and Laubengayer, A. W.: Dimethyl Ether Compound with Boron Trifluoride, 114
- Baumann, Dr. Emil J.: Vitamin C in Plants—*Iris (Iris germanica)*, 683
- Baxter, H. W.: Determination of Specific Heat of Metals, 316
- Beadnell, Major H. J. L.: Death of, 159; *obituary* by Dr. K. S. Sandford, 279
- Beaumont, J. V.: Awarded the Page Prize for 1943 of the Institution of Electrical Engineers, 312
- Beakbane, T. A. B.: Awarded a Muriel Wheldale Onslow Prize by the Council of Nynham College, Cambridge, 163
- Beattie, Prof. J., and Marshall, Major J.: Methionine in the Treatment of Liver Damage, 525
- Beers, Alma Holland (Coker, Prof. William Chambers, and): The Boletaceae of North Carolina, *review* by Prof. C. T. Ingold, 667
- Beeson, Dr. C. F. C.: Inter-relations of Plants and Insects, 425, 426
- Bevers, Dr. C. A.: X-ray Analysis in Industry, 533
- Beirne, Bryan P.: Small Ermine Moths in Ireland, 413
- Belcher, R., and Spooner, C. E.: A New Technique for the Ultimate Microanalysis of Organic Compounds, 24
- Bell, Dr. G. D. H.: Application of Genetics to Plant and Animal Breeding, 781, 783
- Bell, R. P.: Elected a fellow of the Royal Society, 370  
Reaction Kinetics in Solution (Tilden Lecture for 1943 of the Chemical Society), 718
- Bell, R. P. (Longuet-Higgins, H. C., and): Structure of Boron Hydrides, 59
- Bell Laboratories: Photographic Department of the (E. Van Horn), 192
- Benedicks, Prof. Carl, and Sederholm, Per: Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and Foam consisting solely of Liquids, 80
- Influence of an Adsorbed (Inner) Layer on the Cohesion of a Solid, 109
- Benesch, R., Barron, N. S., and Mawson, C. A.: Carbonic Anhydrase, Sulphonamides and Shell Formation in the Domestic Fowl, 138
- Bennet-Clark, Prof. T. A.: Appointed to the University of London chair of botany tenable at King's College, 552; work of, 552
- Bennett, J. G.: Science and Industry, 130  
The Future of Coal for Small-Scale Uses, 338
- Bent, W. G.: New Types of Optical Glass, 559
- Berg, Dr. W. F.: X-ray Analysis in Industry, 535
- Berwick, Prof. W. E. H.: Death of, 645
- Best, Prof. C. H.: Elected a member of the Athenæum, 340
- Betts, E. H.: Evolution and Entropy, 402
- Bewley, Dr. W. F.: Soil Sterilization, 736
- Bhattacharya, K. L. (Chaudhury, Dr. S. G., and): Cataphoretic Velocities of Pure Copper Ferricyanide Sol, 713
- Bhide, Prof. B. V., and others: A Case of Total Asymmetric Synthesis, 141
- Bickerton, J. M.: Fusarium Wilt of the Carnation, 58
- Bielschowsky, Marian, and Green, Prof. H. N.: Organic and Inorganic Pyrophosphates as Shock-inducing Agents, 524
- Biles, R. W., and Maxfield, G. W.: Performance of Generating Plant, 281
- Bilham, E. G.: Weather Wisdom, *review*, 756
- Biologists (Applied), Association of, and the Society of Chemical Industry (Microbiological Panel of the Food Group and the Agricultural Group): Discussion on Soil Sterilization, 736
- Biraud, Dr. Yves: Control of Typhus, 537
- Birkbeck College: Dr. C. T. Ingold appointed to the chair of botany, 552  
Retirement of Prof. Eva G. R. Taylor from the University of London chair of geography, 679, 706  
Appointment of Dr. S. W. Wooldridge to the University of London chair of geography, 679, 706
- Bishop, Dr. Ann, and Gilchrist, Barbara M.: A Method for Collecting Sporozoites of *Plasmodium gallinaceum* by Feeding Infected *Aedes aegypti* through Animal Membranes, 713
- Bishop, D. W.: Mineral Resources of Eire, 532
- Black, D. J. G., and Tyler, Dr. Cyril: Fluctuations in the Porosity of Egg-Shells, 682
- Black, R. P. (Hurst, H. E., and): Rainfall in the Nile Basin (The Nile Basin, Vol. 6), 616
- Black, S. A. B.: Degree of M.D. of the University of Aberdeen conferred on, 431
- Blackett, Prof. P. M. S.: Elected president of the Association of Scientific Workers, 193
- Blackman, Prof. V. H.: *Obituary* of Sir John Farmer, 397
- Blackwell, Elizabeth: Species of Phytophthora as Water Moulds, 496
- Blair, Dr. G. W. Scott: A Survey of General and Applied Rheology, *review* by Dr. L. R. G. Treloar, 543
- Blair, Dr. G. W. Scott, and Veinoglou, B. C.: Comparison of the Behaviour of Rubber-like Materials under Constant Stress and Constant Strain Conditions, 165
- Bligh, N. R.: Radio-Frequency Heating, 430
- Blix, Prof. Gunnar, and Snellman, Olle: Molecular Shape and Size of Hyaluronic Acid and Chondroitinsulphuric Acid, 587
- Blodgett, C. O., and Bruscia, L. (Mehlquist, G. H. L.): Application of Colchicine to *Delphinium cardinale*, 28
- Blyth, F. G. H.: A Geology for Engineers, *review* by Prof. O. T. Jones, 476
- Boas, Prof. Franz: Individual, Family, Population and Race, 33
- Boas, W., and Honeycombe, R. W. K.: Thermal Fatigue of Metals, 494; *erratum*, 770
- Bobrovnikoff, Dr. N. T.: Physical Properties of Comets, 770
- Bodmer, Frederick: The Loom of Language, edited and arranged by Lancelot Hogben, *review* by Major J. Marshall, 729
- Boehm, Prof. Rudolf (1844–1926), 617
- Bogue, Prof. Yule: Photography as a Tool in Agricultural Research, 720
- Bohr, Prof. Niels: Elected a member of the Athenæum, 105
- Bok, Bart J.: Monthly Newsletter for the American Astronomical Society, 770
- Bolton, D. J.: Economic Flux Density in Large Transformers, 19  
Economic Rating of Motors and Transformers, 282
- Bolton, W. (Common, R. H., and): Dried Potato Products and Nutritional Encephalomalacia in Chicks, 744
- Boltz, C. L.: Basic Radio, *review*, 237
- Bonacina, L. C. W.: Wordsworth and Science, 716
- Bonger, Willem Adriaan: Race and Crime, translated from the Dutch by Margaret Mathews Hordyk, *review* by Prof. Cyril Burt, 509
- Bonhoeffer, Dr. Carl: Death of, 218
- Boome, Dr. E. J.: Muscular and Mental Relaxation in Peace and War, 547
- Booth, R. G., and Pringle, W. J. S. (Barton-Wright, Dr. E. C.): Analysis of Barley from King Tutankhamen's Tomb, 288
- Born, Prof. Max, and Peng, H. W.: Statistical Mechanics of Fields and the 'Apeiron', 164
- Bose, C. R. (Banerjee, Prof. K., and): Secondary Non-Laue Reflexions from Phloroglucine Dihydrate, 23
- Boswell, Prof. P. G. H.: Utilitarian Aspects of Geology, *review*, 756
- Boulton, E. H. B., and Jay, B. Alwyn: British Timbers, *review*, 477
- Bourne, Dr. Geoffrey H.: Intracellular Localization of Vitamin C, 254
- Boutros, Bardhan and Tyagi, Drs.: Control of Typhus, 537
- Bowen, C. E.: The Production of Hydrogen and Oxygen by the Electrolysis of Water, 78
- Bowen, E. J.: Fluorescence Spectra of Naphthacene Molecules in Solid Solution of Anthracene with the Variation of Wave-lengths, 653
- Bowen, J. Leonard: A Simple Technique for Photomicrography, 685
- Bowley, Dr. Agatha H.: The Natural Development of the Child, second edition, *review*, 180
- Bowley, Prof. A. L.: Budgetary and Dietary Surveys of Families and Individuals, 307
- Bowling, W. F. (Neate, E. C., and): Transmission Line Supports, 679
- Box, Kathleen, and Thomas, Geoffrey: War-time Social Survey, 647
- Boyd, Prof. J. D. (Hamilton, Prof. W. J., and): Early Human Embryos, 684
- Boydland, Dr. E.: Cancer Research in Britain during 1942–1943, 276
- Boys, Sir Charles: Death of, 428
- Boyse, C. O., and Simpson, N. G.: Conductor Sagging on Overhead Lines, 192
- Brabazon of Tara, Lord: The Sycamore Tree, 493
- Bracey, P. (David, W. A. L., and): Activation of Pyrethrins in Fly-Sprays, 594
- Bragg, Sir Lawrence: Elected an honorary member of the Institute of Metals, 163  
X-ray Analysis in Industry, 533
- Braillford, F.: A Survey of Electrical Sheet Steels for Power Plant and the Factors Affecting their Magnetic Properties, 192
- Brambell, Prof. F. W. Rogers, and Mills, Ivor H.: Prenatal Mortality, 558
- Brancker, A. V., Leach, S. J., and Daniels, V. A.: A Modification to the Cryoscopic Equation, 407
- Brandt, Dr. A. E.: Application of Genetics to Plant and Animal Breeding, 782
- Brandt, Dr. Knut M.: Effect of Carbon Dioxide and Carbon Dioxide Fixation in Baker's Yeast, 343
- Bransby, Dr. E. R.: Budgetary and Dietary Surveys of Families and Individuals, 307
- Breterton, J. L.: The Case for Examinations, *review* by T. Raymont, 723
- Breukelman, J.: Relation of Zoology to the War Effort, 583
- Brew, Dr. J. Macalister (edited by): Clubs and Club Making, *review*, 272
- Brian, Dr. P. W.: Effect of *p*-Amino-Benzoic Acid on the Toxicity of *p*-Amino-Benzene-Sulphonamide to Higher Plants and Fungi, 83
- Briceno-Iragorry, Dr. L.: Typhus in Venezuela, 51
- Bridge, H. S., and Sivbely, W. J. (Davis, R.): Electric Polarizations in Extremely Dilute Solutions, 258
- Brightman, R.: Judgment on Planning, *review*, 508
- Brighton, A. G.: Awarded a Wollaston Fund of the Geological Society, 134
- Brintley, H. H.: Death of, 280; *obituary* by Prof. J. Stanley Gardiner, 309
- Bristowe, Dr. W. S.: *Obituary* of Dr. A. R. Jackson, 613
- British Association Committee on Post-War University Education: Report on University Entrance Scholarships in England and Wales, 4
- British Bryological Society: Annual Reports of the (Miss Eleonora Armitage), 768
- British Building Mission: Report on Building Methods in the United States, 349
- British Coal Utilization Research Association: Annual Meeting, 104  
Presidential Address by Sir Evan Williams, 104  
Ultra-fine Structure of Coals and Coke, *review*, 697
- British Cotton Industry Research Association: Dr. F. C. Toy appointed director of research, 19, 49  
Dr. D. W. Hill appointed deputy director of research, 19  
Retirement of Sir Robert Pickard from the directorship, 49
- British Council: Account of Recent Advances in Bacteriological Methods (Prof. J. Cruickshank), 76  
Film of the operation for the removal of the whole lung (Gaumont Instructional Films), 77  
Publication of the *British Medical Bulletin*, 78  
Prof. P. M. Roxby appointed principal representative in China, 373  
To print a small edition of the *British Medical Bulletin* for sale in the United Kingdom, 649
- British Drug Houses, Ltd.: Dr. Charles Ockrent appointed to the scientific staff, 741
- British Ecological Society: Biological Flora of the British Isles, 425  
Report on Nature Conservation and Nature Reserves, 568
- British Ecological Society and the Royal Entomological Society: Discussion on the Inter-relations of Plants and Insects, 424
- British Electrical and Allied Industries Research Association: Twenty-second Annual Report, 289
- British Empire Cancer Campaign: Annual Report for 1943, 160, 276
- British Industries, Federation of: Report of the F.B.I. Industrial Research Committee, 3  
Industrial Research Committee to be a permanent Standing Committee, 614
- British Institute of Radiology: Twenty-third Silvanus Thompson Memorial Lecture (Prof. Sidney Russ), 585
- British Institution of Radio Engineers: The formation of a British Radio Research Institute, 338

- British Iron and Steel Federation (Iron and Steel Institute and the): Review of the Work of the Joint Research Committees 1924-1943 (Special Report No. 29 of the Iron and Steel Institute), 291
- British Leather Manufacturers' Research Association: R. N. Johnson appointed administrative officer, 492
- British Mycological Society: R. W. Marsh elected president for 1944, 51  
Making a collection of reprints and pamphlets on Mycology and Plant Diseases for distribution after the War, 492
- British Radio Research Institute: Formation recommended by the British Institution of Radio Engineers, 338
- British Shipbuilding Research Association: Establishment of a, 105  
Dr. S. Livingstone Smith appointed director of research, 741
- British Social Hygiene Council: Summer School in Social Biology, 373, 708
- British Society of Animal Production (Alastair N. Worden), 172
- British Standards Institution: Office Organization and Practice, 769
- Britton, Dr. K. G.: A Deluded Sparrow, 559
- Broad, Prof. C. D.: Hr. Von Wright on the Logic of Induction, 430
- Broadbent, Prof. T. A. A.: Work in maintaining the standard of the *Mathematical Gazette*, 536
- Brock, R. C.: Thoracic Surgery, 784
- Brock, Vernon E.: Contribution to the Biology of the Albacore (*Germa alalunga*) of the Oregon Coast and other parts of the North Pacific, 717
- Brockbank, Lieut.-Colonel W., and Whittaker, Major S. R. F.: Control of Typhus, 537
- Broome, R. H.: Photography as a Tool in Agricultural Research, 719
- Brown, Barnum, and Schlackjer, E. M.: A Canadian Dinosaur, 465
- Brown, Prof. Ralph H.: Mirror for Americans, review by Squadron-Leader J. N. L. Baker, 695
- Browne, Dr. Charles A.: Thomas Jefferson and the Scientific Trends of his Time, 584
- Browning, A. J.: Appointed assistant conservator of forests, Sierra Leone, 249
- Brownlie, D.: Mathematics as a Compulsory Examination Subject, 281
- Bruce, Rt. Hon. S. M.: Elected a fellow of the Royal Society, 770
- Brück, Dr. H. A.: On the Distribution of Intensity within the Solar Corona, 452
- Brunt, Prof. D.: Clouds and Weather Phenomena (C. J. P. Cave), second edition revised, review, 237
- Bruscia, L. (Mehliquist, G. H. L., Blodgett, C. O., and): Application of Colchicine to *Delphinium cardinale*, 28
- Buchan, Dr. S.: Awarded a moiety of the Lyell Fund of the Geological Society, 134
- Bryological Society, British: Annual Reports of the (Miss Eleonora Armitage), 768
- Buchthal, Dr. Fritz, Deutsch, Adam, and Knappels, G. G.: Adenosine-triphosphate Initiating Contraction and Changing Bi-refringence in Isolated Cross Striated Muscle Fibres, 774
- Buehler, Dr. H. A.: Death of, 738
- Building Mission, British: Report on Building Methods in the United States, 349
- Buisson, Prof. H.: *Obituaries* by Ch. Fabry and Dr. G. M. B. Dobson, 427
- Butlerwell, J. W.: Death of, 488; *obituary* by Prof. George W. Todd, 580
- Bulman, Dr. O. M. B. (Fearnside, Prof. W. G., and): Geology in the Service of Man, review by Prof. P. G. H. Boswell, 756
- Bunbury, H. M. (edited by Heilbron, Prof. I. M., and): Dictionary of Organic Compounds, Vol. 2: Ecaine—Myrrillin Chloride; Vol. 3: Naphthacarbazole—Zygadenine, review, 668
- Bunge, Mario: *Significado fisico e historico de la teoria de Maxwell*, 77
- Bunn, C. W.: X-ray Analysis in Industry, 533, 534, *erratum*, 585
- Burch, Dr. C. R.: Elected a fellow of the Royal Society, 370
- Burk, R. E., and Grummitt, Oliver (edited by): The Chemistry of Large Molecules, review by Dr. D. D. Pratt, 270
- Burkitt, M. C.: Recent American Archaeology, 322  
*Obituary* of J. Reid Moir, 368
- Burman, U. (Sen, Prof. N. R., and): Hydrogen Content of the Sun and of Stars of Small Masses, 166
- Burns, Eveline M.: Social Security Planning in the United States, 191
- Burns, W. A.: Appointed a senior veterinary officer, Tanganyika, 741
- Burt, Prof. Cyril: The Sociology of Crime, review, 509
- Bury, Henry: High-Angle Edge Flaking of Flint, 227
- Bury, Dr. J. S.: Death of, 738
- Bush, Dr. Vannevar: Awarded the Edison Medal for 1943 of the American Institute of Electrical Engineers, 282  
Awarded the Holly Medal of the American Society of Mechanical Engineers, 282
- Bushnell, G. H. S.: Archaeological Reconnaissance in Guatemala, 61
- Butler-Cole, R. F. Clarke: Appointed senior assistant conservator of forests, Nigeria, 492
- Buxton, Prof. P. A.: Inter-relations of Plants and Insects, 425
- Carlson, Prof. Anton J.: Elected president of the American Association for the Advancement of Science, 282
- Carnap, Prof. Rudolf: Formalization of Logic, review, 8
- Carpenter, Lieut. D.: The American Land, review, 697
- Carpenter, Prof. G. D. Hale: *Obituary* of Sir Edward Poulton, 15  
Inter-relations of Plants and Insects, 425
- Carr, J. L.: Remote Switching by Superimposed Currents, 708
- Carr, T. H.: Electric Power Stations, Vol. 1, second edition, review by C. W. Marshall, 729
- Caspersson, Torbjörn: 'Chromosomin' and Nucleic Acids, 499
- Cassie, Prof. W. Fisher, and others: Geostatistics, 716
- Casson, Lieut.-Colonel Stanley: Death of, 551; *obituary* by Sir John Myres, 613
- Castell, H. C., Dilnot, S., and Warrington, Mrs. Mary: Reaction between Solids, 653
- Castellano, Dr. Enrique: Poisonous Gases in the Exhaust of Diesel Engines, 105
- Catchside, Dr. D. G., and Lea, D. E.: Ionization and Chromosome Breakage, 465
- Catlin, Prof. George: Genealogy of Human Folly, 61  
The End of the National State, review, 359
- Cattell, Dr. J. McKeen: Death of, 399; *obituary* by Willard Connelly, 457
- Caribbean Research Council: Dr. E. E. Williams appointed secretary of the Agricultural Committee, 403
- Cave, C. J. P.: Clouds and Weather Phenomena, second edition revised, review by Prof. D. Brunt, 237
- Chagas, jun., C.: Chagas's Disease in Brazil, 678
- Chakravarty, M.: Studies on Myxosporidia from the Common Food Fishes of Bengal, 113
- Chalonge, Daniel, and Vigroux, Ernest (Barbier, Daniel): Lunar Eclipses and the Earth's Atmosphere, 708
- Champion, Dr. F. C.: Nuclear Energy-Levels, 720
- Champion, Prof. H. G.: Inter-relations of Plants and Insects, 425  
Application of Genetics to Plant and Animal Breeding, 780
- Chandrasekhar, Prof. Subramanya: Elected a fellow of the Royal Society, 370
- Chandrasekhar Aiyar, S. V.: Banded Meson Spectrum and the Rossi Second Maximum, 375
- Chapman, Frederick: *Obituaries* by W. J. Parr and Arthur Earland, 676, 677
- Chapman, K. H.: Classification in Biology, 768
- Charles, Enid: Differential Fertility in Canada, 402
- Chase, S. H.: Applications of Emergency Lighting Systems, 79
- Chattaway, Dr. F. D.: Death of, 159; *obituary* by Dr. G. D. Parkes, 335
- Chattaway, Dr. F. W.: Growth Stimulation of *L. casei* by Pyrimidines, 250
- Chattaway, Dr. F. W., and Sandford, Dr. Mary (Happold, Dr. Frank C.): Microbiological Assay of Riboflavin, 225
- Chaudhury, Dr. S. G.: Donnan Membrane Potential, 593
- Chaudhury, Dr. S. G., and Bhattacharya, K. L.: Cataphoretic Velocities of Pure Copper Ferrocyanide Sol, 713
- Cheesman, Dudley F., and Ehrensward, Gösta C. H.: Slow Protein Hydrolysis in the Presence of 2,4-Dinitrophenylhydrazine, 109
- Chemical Industry, Society of: Election of Prof. E. K. Rideal as president, 193  
Reports of the Progress of Applied Chemistry, Vol. 27, 1942, review, 635
- Chemistry Industry, Society of (Microbiological Panel of the Food Group and the Agricultural Group) and the Association of Applied Biologists: Discussion on Soil Sterilization, 736
- Chemical Industry, Society of (Plastics Group) and the Institution of Electrical Engineers: Discussion on Plastics and Electrical Technology, 641
- Chemical Society: Tilden Lecture for 1943 (Dr. H. W. Thompson), 79  
Ninth Pedler Lecture to be delivered by Dr. C. R. Harington, 312  
Prof. W. N. Haworth elected president, 522  
Tilden Lecture for 1944 (R. P. Bell), 718
- Chemistry, Royal Institute of: Sixty-sixth Annual General Meeting, 372  
Frankland Medal and Prize awarded to Dudley Rhoden Scarffe, 372
- Chemistry Education Advisory Board: Report on the Education and Training of Chemists, 353
- Chen, Dr. H. K., and Hsu, M. K.: A Thermolabile Accessory Growth-factor to Rhizobium, 21
- Chiang Kai-Shek, Madame: Elected an honorary member of the Institute of Metals, 163
- Chichester, Flight-Lieut. Francis: Star Recognition, review, 179
- Childe, Prof. V. Gordon: Historical Analysis of Archaeological Method, review, 206
- Chilton, L. V.: Photographic Photometry, 243
- Chinese National Central Library: To provide British scholars with Chinese material for specialist researches, 770
- Chinese Scientific Societies: Annual Meeting of, 228
- Christensen, Kermit: Elected president of the St. Louis Chapter of the Society of the Sigma Xi, 679
- Chronica Botanica Co.: Publications of the, 403
- Cincinnati Observatory: Dr. Paul Herget appointed director of the, 163  
One Hundred Years at the (Everett L. Yowell), 311
- Clark, N. T., and Stephens, E. H.: Congenital Porphyria in Pigs, 252
- Clark, F. Le Gros: Budgetary and Dietary Surveys of Families and Individuals, 307
- Clark, W. Mansfield: A Challenge to Scholarship, review by T. Raymond, 207
- Clarke, Sir Fred: A Turning Point in Education, review, 177
- Clay, G. F.: Appointed joint development adviser for Northern Rhodesia and Nyasaland, 403
- Clay, Henry: Appointed warden of Nuffield College, Oxford, 649
- Clayden, A. W.: Death of, 399
- Cleaver, G. E.: Training for Citizenship, 437
- Clough Memorial Research Fund: Grants for 1944-1945, 163
- Coal Utilization Research Association, British: Annual Meeting, 104  
Presidential Address by Sir Evan Williams, 104  
Ultrafine Structure of Coals and Coke, review, 697
- Cobb, Prof. Stanley: Borderlands of Psychiatry, review, 272
- Cochran, Doris M.: Poisonous Reptiles of the World, 135
- Cockayne, Dr. E. A.: Inter-relations of Plants and Insects, 424
- Cockshott, C. A.: Appointed inspector of plants and produce, Gold Coast, 51

CALLAN, H. G. (Barber, H. N., and): Distribution of Nucleic Acid in the Cell, 109

Calthrop, J. E.: A German Physics Reader, review, 271

Calvert, E. L., and Muskett, A. E.: Blind Seed Disease of Rye-Grass, 287

Calvert, Dr. H. T.: Water Purification, review, 544

Cameron-Brown, C. A.: Electrical Aspect of Farm Mechanisms, 585

Campbell, Prof. A. N.: Roozeboom's Type II of Solid Solution, 530

Campbell, Prof. D. H.: Continental Drift and Plant Distribution, 717

Campbell, Dr. J. Argyll: Death of, 551; *obituary* by Sir Leonard Hill, 579

Campbell, N. R., and Hey, Dr. D. H.: *p*-Cresol and Estrone in Urine, 745

del Campo, Prof. Clavero, and Gallardo, Dr. Perez: Control of Typhus, 537

Canada, National Research Council of: Twenty-fifth Annual Report for 1941-42, 262

Cancer Hospital (Free), Royal, and the Chester Beatty Research Institute: Selected Papers from the, Vol. 2, review by Dr. P. R. Peacock, 329

Caprell, Prof. D. F., and others: Recognition of a Further Common Rh Genotype in Man, 52

Caribbean Commission, Anglo-American: Report to the Governments of the United States and Great Britain for the Years 1942-1943, 320

Carling, E. Rock: Medical and Surgical Achievement in the U.S.S.R. during War, 419

Carlisle, Dr. C. H.: X-ray Analysis in Industry, 533

- Cody, Dr. H. J. : *Obituary of Sir Robert Alexander Falconer, 102*  
 Coggleshall, Dr. : *Parasitic Diseases, 625*  
 Coker, Prof. William Chambers, and Beers, Alma Holland : *The Boletaceae of North Carolina, review by Prof. C. T. Ingold, 667*  
 Cole, Prof. F. J. : *Hieronymus Fabricius, 1533-1619, review, 149*  
*Vesaliana, review, 694*  
 Colhoun, Dr. John : *Grey Mould (Botrytis cinerea) of Flax, 25*  
 Collinge, Dr. Walter E. : *Reproduction of the Woodlouse Armadillidium vulgare (Latr.), 776*  
 Collins, Selwyn D., and Council, Clara : *Immunizations in Large Cities of the United States, 249*  
 Colonial Office : *Mass Education in African Society, 607*  
*Appointments and promotions, 51, 249, 282, 403, 492, 617, 741*  
 Colonial Products Research Council : *First Interim report, 133*  
 Colonial Research Committee : *Progress Report 1942-1943, 119*  
 Colonies, Commission on Higher Education in the : *Committee appointed on Higher Education in the Caribbean, 134*  
 Combined Raw Materials Board : *Second Annual Report, 740*  
 Common, R. H., and Bolton, W. : *Dried Potato Products and Nutritional Encephalomalacia in Chicks, 744*  
 Comparat, P. : *Disintegration of Nitrogen by Fast Neutrons, 720*  
 Conklin, Prof. Edwin Grant : *Man, Real and Ideal, review by the Very Rev. W. R. Matthews, 38*  
 Conn, Dr. J. F. C. : *Awarded the Premium for 1943 of the Institution of Naval Architects, 220*  
 Connelly, Willard : *Obituary of Dr. J. McKeen Cattell, 457*  
 Conservative Central Committee on Post-War Problems : *Report of the Sub-Committee on Industry on Work, the Future of British Industry, 355*  
 Conservative and Unionist Party Organization : *Report on Foundation for Housing, 725*  
 Conway, Prof. E. J., and Fearon, P. J. : *Acid-labile Carbon Dioxide in Mammalian Muscle and the Hydrogen Ion Concentration of the Muscle Fibre, 54*  
 Conway, Prof. E. J., and O'Malley, E. : *Nature of the Cation Exchanges during Short-Period Yeast Fermentation, 555*  
*Formation of Hydrogen Ions in High Concentration by Ordinary Baker's Yeast, 652*  
 Conway, Frank G. (Moore, Dr. Quintin, Wylie, Thos. Smith, and) : *Science Class Lecture Ciné-Films, 784*  
 Cook, Dr. A. H., and Lacey, Dr. M. S. : *An Antibiotic from Aspergillus parasiticus, 460*  
 Coolidge, Dr. W. D. : *Awarded a Franklin Medal for 1944, 741*  
 Cooper, W. Fordham, and Mann, F. H. : *Industrial Fire Risks, 248*  
 Copsarow, Dr. Maurice : *Grassland Improvement, 256*  
 Corbet, Dr. A. Steven : *Palaeontology without Fossils in the 'Bird-Wing' Butterflies, 32*  
 Cornforth, J. W., Cornforth, Mrs. R. H., and Dewar, M. J. S. : *Reported Asymmetric Synthesis of Santonin, 317*  
 Cotton, A. D. : *The Megaphytic Habit in the African Tree Senecios and other Genera, 679*  
*Elected president of the Linnean Society of London, 679*  
 Cotton Industry Research Association, British : *Dr. F. C. Toy appointed director of research, 19, 49*  
*Dr. D. W. Hill appointed deputy director of research, 19*  
*Retirement of Sir Robert Pickard from the directorship, 49*  
 Coumoulos, Dr. G. : *X-ray Analysis in Industry, 534*  
 Coumoulos, G. D. : *Electron Diffraction of Amorphous Polymers, 259*  
 Council, Clara (Collins, Selwyn D., and) : *Immunizations in Large Cities of the United States, 249*  
 Courant, Prof. R., and Hilbert, Prof. D. : *Methoden der mathematischen Physik, Band I, Zweite verbesserte Auflage, Band 2, review by Prof. L. M. Milne-Thomson, 633*  
 Couzens, E. G., and Wearmouth, Dr. W. G. : *Plastics in the Radio Industry, review, 418*  
 Cowin, G. S. : *Appointed a senior veterinary officer, Tanganyika, 741*  
 Cowley, W. L. : *Aerodynamics of the Aeroplane, review, 272*  
 Cowling, Dr. T. G. : *Solar Phenomena and some Allied Geophysical Effects, 452*  
 Cox, Dr. E. G. : *X-ray Analysis in Industry, 533*  
 Cox, H. E., and Wilcox, T. W. : *High-Voltage Circuit-Breaker Technique, 627*  
 Cox, J. W. (Eckersley, T. L., Millington, G., and) : *Ground and Cloud Scatter of Electromagnetic Radiation, 341*  
 Craik, Dr. K. J. W. : *White Plumage of Sea-Birds, 288, 527*  
*The Nature of Explanation, review, 605*  
*Appointed director of the Medical Research Council's Unit for Research in Applied Psychology at Cambridge, 617*  
 Cranborne, Lord : *Functional Collaboration in Colonial Territories, 159*  
 Crane, M. B. : *Application of Genetics to Plant and Animal Breeding, 780*  
 Creasy, G. H. : *Elected chairman of the Imperial Agricultural Bureaux, 403*  
 Crew, Prof. F. A. E. : *Appointed to the Bruce and John Usher chair of public health in the University of Edinburgh, 371*  
 Crocker, Lucy H. (Pearse, Dr. Innes H., and) : *The Peckham Experiment, review by Dr. M. L. Johnson, 269*  
 Crombie, Dr. A. C. (Pirenne, Dr. M. H., and) : *White Plumage of Sea-Birds, 526*  
 Crowfoot, Dr. Dorothy : *X-ray Analysis in Industry, 533*  
 Crowfoot, Dr. Dorothy, and Rogers-Low, B. W. : *X-Ray Crystallography of Gliotoxin, 651*  
 Cromwell, B. T. : *Putrescine in the Biosynthesis of Hyoscyamine, 717*  
 Crook, Dr. E. M. : *Photography as a Tool in Agricultural Research, 719*  
 Cruickshank, Prof. J. : *Recent Advances in Bacteriological Methods, 76*  
 Cruickshank, Dr. Robert : *Food-Poisoning, review, 418*  
 Cuatrecasas, Jose : *The Colombian Hypericum, 402*  
 Cull, L. E. : *The Place of Food in the War Effort, 583*  
 Cullen, Dr. William : *Elected president of the Science Masters' Association, 193*  
 Cumberland, K. B. : *Contrasting Regional Morphology of Soil Erosion in New Zealand, 492*  
 Cunningham, Dr. W. R. : *Obituary of Dr. James MacLehose, 47*  
 Curley, Colonel E. M. : *Improvement of Livestock, 117*  
 Curme, jun., Dr. George O. : *Awarded the Willard Gibbs Medal for 1944 of the Chicago Section of the American Chemical Society, 400*  
 Cursetjee (Wadia), Ardaseer : *Work of, 706*  
 Cushing, Harvey : *A Bio-Bibliography of Andreas Vesalius, review by Prof. F. J. Cole, 694*
- DADE, H. A. : *Names of Biological Colours, 220*  
 Dade, H. A. (Melville, Dr. Ronald, and) : *Chalk Brood Attacking a Wild Bee, 112*  
 Dalal, Sir Ardeshir : *Appointed a member of the Executive Council of the Governor-General of India, 708*  
 Dale, Sir Henry : *The Natural History and Chemistry of Drugs, 103*  
*Appointed chairman of the Penicillin Committee, 401*  
*Awarded the Dr. Bimala Churn Law Gold Medal of the Indian Association for the Cultivation of Science, 679*  
*Awarded the Order of Merit, 739*  
 Dalley, Christopher : *Death of, 218*  
 Daltry, C. T. : *Reform of School Mathematical Syllabuses, 535*  
 Daly, Prof. Reginald Aldworth : *The Floor of the Ocean, review by Prof. Arthur Holmes, 389*  
*Meteorites and an Earth-Model, 718*  
 Daniel, Dr. Glyn E. : *The Three Ages, an Essay on Archaeological Method, review by Prof. V. Gordon Childe, 206*  
 Daniels, V. A. (Branner, A. V., Leach, S. J., and) : *A Modification to the Cryoscopic Equation, 407*  
 Dannreuther, Capt. T. : *Obituary of Edward A. Martin, 159*  
 Darling, Dr. F. Fraser : *Island Farm, review by Seton Gordon, 390*  
 Darlington, Dr. C. D. : *Application of Genetics to Plant and Animal Breeding, 780, 783*  
 Davenport, Dr. Charles B. : *Death of, 488 ; obituary by Dr. K. Mather, 644*  
 Davey, Dr. D. G. : *Biology of the Malarial Parasite in the Vertebrate Host, 110*  
 David, W. A. L., and Bracey, P. : *Activation of Pyrethrins in Fly-Sprays, 594*  
 Davidson, C. F. : *Archæan Gneisses of the Rodil District of South Harris, 466*  
 Davidson, Dr. James : *Development of Botanical Investigations at Rothamsted, 198*  
 Davies, C. : *Types and Varieties of Farm Machines, 117*  
 Davies, Prof. Francis : *A Human Embryo, Nine to Ten Days Old, 463*  
*Early Human Embryos, 684*  
 Davies, W. W. : *Road Accidents and Road Structure, 330*  
*Road Safety and Road Structure, 657*  
 Davis, R., Bridge, H. S., and Svirbely, W. J. : *Electric Polarizations in Extremely Dilute Solutions, 258*  
 Dawson, H. M., Pycock, E. R., and Smith, G. F. : *Acids and Bases, 466*  
 Deacon, G. E. R. : *Elected a fellow of the Royal Society, 370*  
 Dean, J. N., and Scott, T. R. (Barron, Dr. H.) : *Thermoplastic Electric Cables, 248*  
 DeBuske, J. J. : *Noise Measurement in Vacuum Tubes, 114*  
 de la Mare, P. B. D., and Shorland, F. B. : *Fat of Sow's Milk, 380*  
 De La Warr, Earl : *Visit to Canada, 51*  
 Delbruck, M. (Luria, G., and) : *Mutations in Bacteria, 717*  
 Delf, Dr. E. M. : *Fluctuations in Seaweed, 223*  
 Dell, R. : *Railway Signalling on London Transport, 648*  
 Denison, Jr., John H. (Ruppert, Karl, and) : *Archæological Reconnaissance in Campeche, Quintana Roo, and Peten, 61*  
 Dent, H. C. : *Education in Transition, review by Sir Fred Clarke, 177*  
 Deo, P. G. (Joshi, Prof. S. S., and) : *Light-Effect in Chlorine under Electrical Discharge : Influence of the Gas Pressure, 434*  
 Deraniyagala, P. : *Addition to the obituary notice of Hugh Whistler, 522*  
 Desgulliers, John Theophilus (1683-1744), 246  
 Desch, Dr. C. H. : *Obituary of F. S. Marvin, 47*  
 Deutsch, Adam, and Knappes, G. G. (Buchthal, Dr. Fritz) : *Adenosine-triphosphate Initiating Contraction and Changing Bi-refringence in Isolated Cross Striated Muscle Fibres, 774*  
 Dévé, Col. Charles : *Optical Workshop Principles, translated by Thomas L. Tippell, review by Dr. W. D. Wright, 544*  
 Dewar, M. J. S. (Cornforth, J. W., Cornforth, Mrs. R. H., and) : *Reported Asymmetric Synthesis of Santonin, 317*  
 Dewberry, Elliott B. : *Food-Poisoning, review by Dr. Robert Cruickshank, 418*  
 Dhar, Prof. N. R., and Pant, Dr. N. N. : *Nitrogen Loss from Soils and Oxide Surfaces, 115*  
 Diamond Trading Co., Ltd. : *Establishment of a Research Department, 249*  
 Dice, Lee R. : *The Biotic Provinces of North America, review, 697*  
 Dickens, Dr. F. : *The New Cytology, review, 327*  
 Dickson, Dr. E. C. Scott : *Death of, 488 ; obituary by Dr. J. M. Nuttall, 645*  
 Dilnot, S., and Warrington, Mrs. Mary (Castell, H. C.) : *Reaction between Solids, 653*  
 Dinan, J. F., and others : *Promin Treatment of Leprosy, 465*  
 Dingle, Prof. Herbert : *Fundamental Concepts of Natural Philosophy, 304*  
*The Laws of Nature, 731, 758*  
 Dingwall, Dr. E. J. : *New Light on Telepathic Phenomena, review, 298*  
 Diver, Capt. C. : *Inter-relations of Plants and Insects, 425*  
 Dixon, E. : *Appointed veterinary officer, Nigeria, 282*  
 Dixon, H. N. : *Death of, 645 ; obituary by Dr. J. Ramsbottom, 705*  
 Dixon, Dr. T. F. : *Biochemical Importance of Individual Amino-Acids, 289*  
 Dobb, M. H. : *Philosophy of Economics, review, 236*  
 Dobson, Dr. G. M. B. : *Obituary of Prof. H. Buisson, 427*  
 Dodds, K. G. : *Effects of Banana Selection, 258*  
 Doggett, H. : *Appointed agricultural officer, Tanganyika, 249*  
 Doherty, Dr. William Brown, and Runes, Dr. Dagobert D. (edited by) : *Rehabilitation of the War Injured, review, 329*  
 Dolby, Dr. Doris E., Happold, Dr. Frank C., and Sandford, Dr. Mary : *Growth-Factors Required for the Nutrition of Lactobacillus casei, 619*  
 Dolby, Dr. Doris E., and Waters, J. W. : *Use of Casein Hydrolysate in Experiments on the Nutrition of Lactobacillus casei, 139*  
 Dollar, Capt. A. T. J. : *Cellulose Acetate Mounts for Rock and Mineral Fragments, 226*  
 Dominion Observatory, Wellington : *Report for the Year 1942, 219*  
 Donald, Dr. H. P. : *Application of Genetics to Plant and Animal Breeding, 781*  
 Donald, M. B. : *Applied Chemistry, review, 297*  
 Donisthorpe, H. : *List of the Type Species of the Genera and Subgenera of the Formicidae, 322*  
 Donnay, Prof. F. G. : *Achilles and the Tortoise, a Variant, 142, 464*  
 Doorly, Eleanor : *The Microbe Man, review, 668*

- Dorfman, W. A. : Physico-Chemical Nature of Bacteriolysis, 169  
 Douglas, A. C. : Cloud Reading for Pilots, *review*, 96  
 Douglas, Prof. C. G. : *Obituary* of Prof. Yandell Henderson, 308  
 Dow, Dr. R. : Some Rheological Properties of Matter under High Hydrostatic Pressure, 78  
 Drake, H. : The Influence of Maintenance Requirements on the Design of Electrical Installation Equipment, 430  
 Drakeley, Dr. T. J. : Training for the Chemical Industries, 431  
 Driver, C. M., and Hawkes, J. G. : Photoperiodism in the Potato, 318  
 Drummond, Sir Jack : Elected a fellow of the Royal Society, 370  
 Freedom from Want of Food, 750  
 Drummond, Sir Jack, and Moran, Dr. T. : Unconsidered Trifles in our Diet, 99  
 Drury, Dr. A. N. : *Obituary* of Prof. W. W. C. Topley, 215  
 Duff, Prof. J. F. : Retirement from the selection committee of the Miners' Welfare National Scholarship Scheme, 79  
 Duggan, J. B. : Mineral Deficiencies in Fruit Trees, 28  
 Duke, H. Lyndhurst, and Stott, W. B. : Duration of Immunization against Diphtheria, 318  
 Duncan, Prof. J. G. : *Death* of, 706  
 Dundas, Ltd., R. K. : The 'Microtimer', 599  
 Dunlop, Dr. J. C. : *Death* of, 581  
 Dunn, Prof. J. Shaw : *Death* of, 738  
 Dunton, A. R. : The Control, Specialized Testing and Use of some Modern Insulating Materials, 79  
 Duperier, Prof. A. : Absorption in the Atmosphere and Decay of Cosmic Rays, 529  
 Duthie, D. W. : Appointed soil chemist, East African Agricultural Research Bureau, Tanganyika, 249
- EARLAND**, Arthur : *Obituary* of Frederick Chapman, 677  
 Eccles, C. G., and others : Promin Treatment of Leprosy, 465  
 Eccles, Prof. John C. : Synaptic Transmission in the Spinal Cord, 432  
 Eckersley, T. L., Millington, G., and Cox, J. W. : Ground and Cloud Scatter of Electromagnetic Radiation, 341  
 Ecological Society, British : Biological Flora of the British Isles, 425  
 Report on Nature Conservation and Nature Reserves, 568  
 Ecological Society, British, and the Royal Entomological Society : Discussion on the Inter-relations of Plants and Insects, 424  
 Edge, A. Broughton, and Hallimond, Dr. A. F. : Petrological Microscopes, 716  
 Edgell, Admiral Sir John : Vertical Section of a Coral Atoll, 680  
 Edgeworth, Lieut.-Colonel K. E. : Origin of the Solar System, 140  
 Education, Conference of Allied Ministers of : Dr. E. F. Armstrong appointed chairman of a commission on the supply of Scientific Instruments to the Occupied Countries, 220  
 Educational and Cultural Reconstruction, 520  
 Education in Scotland, Advisory Council on : Report on Training for Citizenship, 265  
 Education (Health), Central Council for : Summer schools during 1944, 373  
 Education (Higher) in the Colonies, Commission on : Dr. R. E. Priestley appointed an additional member, 79  
 Committee appointed on Higher Education in the Caribbean, 134  
 Edwards, Dr. : Ox Blood for Blood Transfusion, 145  
 Edwards, C. P. : Enemy Airborne Radio Equipment, 290  
 Edwards, Dr. Joseph : Breeding of Dairy Cattle, 172  
 Edwards, P. M. J. (Mather, Dr. K., and) : Specific Differences in Petunia, 661  
 Edwards, Lieut. Willard E. : The Edwards Perpetual Calendar, 229  
 Ehrensward, Gösta C. H. (Cheesman, Dudley F., and) : Slow Protein Hydrolysis in the Presence of 2,4-Dinitrophenylhydrazine, 108  
 Eidinow, A. : *Death* of, 399  
 Electric Power Companies, Incorporated Association of : Memorandum with regard to the Electricity Supply Industry in Great Britain, 382  
 Electrical and Allied Industries Research Association, British : Twenty-second Annual Report, 289  
 Ellerton, Dr. S. : Reaction of Wheat Varieties Grown in Britain to Erysiphe, 776  
 Application of Genetics to Plant and Animal Breeding, 782  
 Ellison, M. A. : Sunspot Prominences, some Comparisons between Limb and Disk Appearances, 452  
 Elwin, Verrier : Truth in Anthropology, 624  
 Emeléus, Prof. H. J. : Inorganic Chemistry (Post-Graduate Lectures), *review*, 237  
 Emery, W. B., and Robinson, F. A. (Barton-Wright, Dr. E. C.) : New Components of the Vitamin B Complex, 771  
 Engineering and Allied Employers National Federation : Agreement with the Association of Scientific Workers, 649  
 Engineers (Chemical), Institution of : Endowment of the J. Arthur Reavell Lecture, 51  
 Resignation of Dr. A. J. V. Underwood as joint honorary secretary, 741  
 Engineers (Chemical), Institution of, and the Institute of Physics : Joint conference on Instruments for the Automatic Controlling and Recording of Chemical and other Processes, 617  
 Engineers (Civil), Institution of : James Alfred Ewing Medal for 1943 awarded to Group Captain Frank Whittle, 554  
 Engineers (Electrical), American Institute of : Edison Medal for 1943 awarded to Dr. Vannevar Bush, 282  
 Engineers (Electrical), Institution of : Faraday Medal awarded to Dr. Irving Langmuir, 190  
 Election of Sir Ernest Thomas Fisk as an honorary member, 190  
 Formation of a Wireless Group for Cambridge and District, 193  
 Coopers Hill War Memorial Prize and Medal for 1943 awarded to Harold Page, 312  
 Page Prize for 1943 awarded to J. V. Beaumont, 312  
 Awards of the Duddell and Manville Scholarships, 312  
 Electricity Supply, Distribution and Installation (Report from the Post-War Planning Committee), 382  
 Twenty-fifth anniversary of the Wireless Section, 492  
 Annual Report for 1943-44, 770  
 Engineers (Electrical), Institution of, and the Plastics Group of the Society of Chemical Industry : Discussion on Plastics and Electrical Technology, 641  
 Engineers (Mechanical), American Society of : Holly Medal awarded to Dr. Vannevar Bush, 282
- Engineers (Mechanical), Institution of : Dr. Harry R. Ricardo elected president, 249  
 Thirtieth Thomas Hawksley Lecture (Prof. C. E. Inglis), 278  
 Engineers (Radio), British Institution of : The formation of a British Radio Research Institute, 338  
 Enoch, Dr. H. E., and Wallersteiner, Dr. W. K. S. : A Standardized Antibacterial Pyrogen-free Metabolite Preparation containing Living *Penicillium notatum*, 380  
 Enoch, Arthur Guy : This Milk Business, *review* by Prof. H. D. Kay, 476  
 Entomological Society (Royal), and the British Ecological Society : Discussion on the Inter-relations of Plants and Insects, 424  
 Entomologists' Society, Amateur : Directory of Natural History Societies, 161  
 Entomology, Imperial Institute of : Dr. W. J. Hall appointed assistant director, 649  
 Ephraim, Fritz : Inorganic Chemistry, English edition by Dr. P. C. L. Thorne and Dr. E. R. Roberts, fourth edition revised, *review* by Prof. James Kendall, 358  
 Erb, Dr. H. : Relation of Academic Training to Industry, 561  
 Escritt, L. B. : Regional Planning, *review* by Prof. A. E. Trueman, 7  
 Esdaille, Dr. Arundell : *Obituary* of Dr. A. W. Pollard, 487  
 de Espinosa, Antonio Vázquez : Compendium and Description of the West Indies, translated by Charles Upson Clark, *review* by Dr. J. N. L. Baker, 299  
 Esso Research Club, Elizabeth, N.J. : Affiliated to the Society of the Sigma Xi, 373  
 Ewald, Dr. P. P. : International Development of Crystallography, 535  
 Eyles, V. A. : Function and Future of Colonial Geological Surveys, 273  
 Minerals in Industry, *review*, 668  
 Eyre, Prof. J. W. H. : *Death* of, 280 ; *obituary* by Prof. F. A. Knott, 398  
 Eyring, Henry, and others : High Polymers, *review*, 665
- FABERGÉ**, A. C. : Genetics of *Papaver alpinum*, 531  
 Fabricius of Aquapendente (Hieronymus) : The Embryological Treatises of (Prof. Howard B. Adelman), *review* by Prof. F. J. Cole, 149  
 Fabry, Ch. : *Obituary* of Prof. H. Buisson, 427  
 Falconer, D. S. : White Plumage of Sea-Birds, 777  
 Falconer, Dr. J. D. : Colonial Geological Surveys, 409  
 Falconer, Sir Robert Alexander : *Obituary* by Dr. H. J. Cody, 102  
 Falk, John E., and Rubbo, Sydney D. (Albert, Dr. Adrien) : Antibacterial Action of Arsenic, 712  
 Faraday Society : Message from the Soviet Scientists Antifascist Committee on the action of the Germans in the U.S.S.R., 49  
 Farmer, Sir John Bretland : *Death* of, 159 ; *obituary* by Prof. V. H. Blackman, 397  
 Farquhar, Mme. Margaret C. M., and Weill, Miss Adrienne R. : Detection of the Ka Satellites on X-Ray Powder Photographs, 56  
 Farquharson, R. F. (Pugsley, H. E., and) : Isinglass as a Substitute for Human Blood Plasma, 248  
 Faruqi, Colonel : Control of Typhus, 537  
 Faulkner, Edward H. : Plowman's Folly, *review* by Dr. R. K. Schofield, 391  
 Faust, G. T., and Hendricks, S. B. (Hill, W. L.) : Forms of Phosphoric Oxide, 29  
 Fearnside, Prof. W. G., and Bulman, Dr. O. M. B. : Geology in the Service of Man, *review* by Prof. P. G. H. Boswell, 756  
 Fearon, P. J. (Conway, Prof. E. J., and) : Acid-labile Carbon Dioxide in Mammalian Muscle and the Hydrogen Ion Concentration of the Muscle Fibre, 54  
 Fearon, W. R. (Kawerau, E., and) : Thiourea as Protective Agent for Vitamin C, 384  
 Federation of British Industries : Report of the F.B.I. Industrial Research Committee, 3  
 Industrial Research Committee to be a permanent Standing Committee, 614  
 Fegler, Prof. J. : Function of Carbonic Anhydrase in Blood, 137  
 Feldman-Muhsam, B. (Goldhaber, G., and) : Immediate Effect of X-Rays on the Movements of Larvæ and Pupæ of Mosquitoes, 523  
 Fermor, Sir Lewis : Bombay Island, 565  
 Awarded the P. N. Bose Memorial Medal for 1943 of the Royal Asiatic Society of Bengal, 617  
 Ferry, John D., and others : High Polymers, *review*, 665  
 Fessenkoff, V. G. : Origin of the Zodiacal Light, 114  
 Field, L. M. (Spangenberg, K., and) : Electrostatic Electron Lenses, 441  
 Field, Richard M., and Stetson, Harlan T. : Map Reading and Avigation, *review*, 180  
 Filkins, W. J. J. : Appointed physiological laboratory superintendent, Uganda, 282  
 Finding, S. L. : Appointed assistant conservator of forests, British Honduras, 249  
 Findlay, Prof. Alexander : Re-elected president of the Royal Institute of Chemistry, 372  
 Introduction to Physical Chemistry, second edition, *review*, 730  
 Finlay, G. R., and Laubengayer, A. W. (Bauer, S. H.) : Dimethyl Ether Compound with Boron Trifluoride, 114  
 Finney, D. J. : Mathematics of Biological Assay, 284  
 Fisher, Dr. A. M. (Scott, Dr. D. A., and) : Carbonic Anhydrase, 711  
 Fisher, Prof. R. A. : Application of Genetics to Plant and Animal Breeding, 782  
 Fisher, Prof. R. A., Race, Dr. R. R., and Taylor, Dr. G. L. : Mutation and the Rhesus Reaction, 106  
 Fisk, Sir Ernest Thomas : Elected an honorary member of the Institution of Electrical Engineers, 190 ; work of, 190  
 Fitter, R. S. R. : The Black Redstart, a New British Breeding Bird, 659  
 Fitzgerald, Walter : Appointed professor of geography in the University of Manchester, 340, 489  
 Progress in Geographical Method, 481  
 Fleming, Prof. Alexander : Elected to an honorary life membership of the New York Academy of Sciences, 163  
 Fleming, Dr. A. P. M. : Research Workers, their Education and Place in Industry, 371  
 Fletcher, W. C. : Reform of School Mathematical Syllabuses, 535  
 Fletcher, W. P. : Effect of Temperature upon the Mechanical Properties of Rubber-like Materials, 341

- Fleure, Prof. H. J. : To retire from the chair of geography in the University of Manchester, 489 ; work of, 489  
 Racial Discrimination, *review*, 604  
 Problems of Race, *review*, 667
- Florence, Prof. P. Sargent : A Social Medicine based on Social Statistics, 363
- Flory, Prof. H. W. : Penicillin, its Development for Medical Uses, 40  
 Flory, Prof. H. W., Jennings, M. A., and Philpot, Flora J. : Claviformin from *Aspergillus giganteus* Wehm., 139
- Flory, Paul J., and others : High Polymers, *review*, 665
- Fodor, P. I., and Kuk-Meiri, S. : Nature of Peptones, 250
- Food, Ministry of : Fourth Report on National Flour and Bread, 154
- Forde, Prof. Daryll : Education and the Community in Africa, 606
- Forest Products Research Laboratory : Leaflet No. 30, Observations on the Design of Timber-drying Kilns, 339  
 Leaflets Nos. 31 and 32, Some Foreign Timbers (South America), 3 and 4, 564
- Forest Research Institute, Dehra Dun : Research work on Plywood Adhesives, 173  
 Work of the, 201
- Forster-Cooper, Dr. C. : *Obituary* of J. R. Norman, 738
- Foster, C. L. : Effect of Colchicine on Golgi Bodies, 556
- Foster-Carter, Dr. A. F. : Anatomy of the Bronchi, 784
- Fowler, Henry W. : Fishes from the Philippine Seas, 135
- Frankenthal, Dr. L. : Role of Phosphate in the Methylene Blue Reduction by Dehydroascorbic Acid, 255
- Franklin, R. H. : Tannic Acid and Burns, 584
- Franklin Institute : The Fels Planetarium of the (Roy K. Marshall), 616
- Fraser, Sir Colin : *Death* of, 370
- Fraser, F. C. : Whalebone Whales in the Antarctic, *review*, 569
- Fraser, Sir John : Elected principal of the University of Edinburgh, 489
- French, Sir James Weir : J. B. Hannay and the Artificial Production of Diamonds, 112
- Freshwater Biological Association : Scientific Publication No. 8 on Keys to the British Species of Aquatic Megaloptera and Neuroptera (D. E. Kimmins), 741
- Frewing, J. J. : Boundary Lubrication and Heat of Absorption, 718
- Friedmann, Dr. W. : The Crisis of the National State, *review* by Prof. George Catlin, 359
- Fritsch, Prof. F. E. : A New Genus of Terrestrial Algæ, 620
- Frolich, Dr. Per K. : Petroleum—Past, Present and Future, 565
- Fry, Maxwell : Appointed town-planning advisor to the West African Governments, 18
- Frye, J. C., and Kaiser, C. P. : Geology in the Present War, 583
- Fryer, J. C. F. : Appointed secretary of the Agricultural Research Council, 767 ; work of, 767
- Fuel and Power, Ministry of : Committee of inquiry into the Gas Industry of Great Britain, 741
- Fuller, C. S., and others : High Polymers, *review*, 665
- Fuoss, Raymond M., and others : High Polymers, *review*, 665
- G**
- GADDUM, Prof. J. H. : Repeated Doses of Drugs, 494
- Gallardo, Dr. Perez (del Campo, Prof. Clavero, and) : Control of Typhus, 537
- Galloway, L. D., and Hobson, A. J. : Penicillin Dressings, 170
- Ganguly, S. C. : Fluorescence Spectra of Naphthalene Molecules in Solid Solution of Anthracene with the Variation of Wave-lengths, 652
- Gardiner, Prof. J. Stanley : *Obituary* of H. H. Brindley, 309
- Gardner, M. B. : Measurement of Hearing and Deafness, 87
- Garnett, Dr. Maxwell : Post-War University Education, 142  
 An International Language, *review*, 205  
 The World We Mean to Make and the Part of Education in Making It, *review* by Prof. R. A. C. Oliver, 755
- Gatenby, Prof. J. Brontë : Centenary of Zoological Teaching in Trinity College, Dublin, 723
- Gates, Prof. R. Ruggles : Nucleoli and related Nuclear Structures, 688
- Gaumont Instructional Films : Film showing the operation for the removal of the whole lung, 77
- Gaydon, Dr. A. G. : Carbon Monoxide 'Cool Flame', 259  
 Dissociation Energy of Nitrogen, 407
- Gaydon, Dr. A. G., and Worley, Dr. R. E. : Singlet Terms in the Spectrum of Molecular Nitrogen, 747
- Gear, Lieut.-Colonel H. S. : The Hygiene of the Eighth Army in North Africa, 688
- Genetical Society : Symposium on the Application of Genetics to Plant and Animal Breeding, 780
- Geoghegan, Dr. Joseph : The Study of Morale, *review*, 66
- Geological Society : Medal Awards, 134
- Ghandy, J. J. : Industrial Research, with special reference to India, 624
- Ghosh, Sir J. C. : Post-War Organization of Scientific Research in India, 429
- Ghurye, Prof. G. S. : The Aborigines—'so-called'—and their Future, *review*, 668
- Gibbins, N. M. : Infinite Series for Fifth Formers, 536
- Gibson, Prof. Charles S. : Reported Asymmetric Synthesis of Santonin, 225
- Gilchrist, Barbara M. (Bishop, Dr. Ann, and) : A Method for Collecting Sporozoites of *Plasmodium gallinaceum* by Feeding Infected *Aedes aegypti* through Animal Membranes, 713
- Gill, Colonel C. A. : The Reform of the Calendar, 229
- Gilmour, J. S. L. : Scientific Ethical Principles, *review*, 94
- Glins, Dr. A. R., Alvarez, Dr. A., and Mercado, Dr. M. : Tuberculosis in Paraguay, 248
- Giri, Dr. K. V., and Rao, P. Seshagiri : Urease Activity and Ascorbic Acid, 253
- Glass, Prof. Bentley : Genes and the Man, *review* by Prof. J. B. S. Haldane, 234
- Glenny, Dr. A. T. : Elected a fellow of the Royal Society, 370
- Gliester, G. A., and Williams, T. I. : Production of Gliotoxin by *Aspergillus fumigatus* mut. *helvola* Yullii, 651
- Glückauf, Dr. E. : Carbon Dioxide Content of Atmospheric Air, 620
- Göddwin, Dr. H. : Inter-relations of Plants and Insects, 425  
 Neolithic Forest Clearance, 511
- Gogate, Prof. D. V., and Rai, R. N. : Surface Flow of Liquid Helium II and Bose-Einstein Degeneracy, 342
- Goldacre, Reginald (Albert, Dr. Adrien) : Basicities of the Aminoquinolines—Comparison with the Aminoacridines and Aminopyridines, 467
- Goldfinger, G., and others : High Polymers, *review*, 665
- Goldhaber, G., and Feldman-Muhsam, B. : Immediate Effect of X-Rays on the Movements of Larvæ and Pupæ of Mosquitoes, 528
- Goldhaber, M. : Nuclear Disintegrations Produced by Cosmic Rays, 221
- Goldney, K. M. (Soal, S. G., and) : Experiments in Precognitive Telepathy, *review* by Dr. E. J. Dingwall, 298
- Golds, L. B. S., and Lipman, C. L. : A Modern Earth-Fault Relay Equipment for use on Systems Protected by Petersen Coils, 469
- Goldschmidt, Prof. V. M. : Awarded the Wollaston Medal of the Geological Society, 134
- Goodall, D. W. : Mineral Deficiencies in Fruit Trees, 28
- Goodrich, Prof. E. S. : *Obituary* of Flight-Lieut. J. A. Moy-Thomas, 427
- Goodwin, T. W. (Morton, Dr. R. A., and) : Preparation of Retinene *in vitro*, 405
- Gordon, Seton : Pioneering Farming on a Western Scottish Island, *review*, 390
- Göthlin, Gustaf F. : The Fundamental Colour Sensations in Man's Colour Sense, *review* by Prof. H. E. Roaf, 235
- Göttingen Medical School : British Medicine and the, 678
- Graham, Herbert W. : Studies in the Morphology, Taxonomy and Ecology of the Peridinales, 661
- Grainger, Dr. John : A Survey of Plant Disease, *review*, 447
- Granichestaden, Dr. E. : *Obituary* by Dr. M. F. Perutz, 428
- Graves, H. C. H. (Price, S. A., and) : Microbiological Assay of Riboflavin, 461
- Gray, Basil : *Obituary* of Sir Aurel Stein, 216
- Gray, Dr. Robert C. : Gyroscopic Principles and Applications, 277  
 Incidence of Colour-Vision Weakness, 657
- Greaves, R. I. N. : Centrifugal Vacuum Freezing, 485
- Green, Prof. H. N. (Bielschowsky, Marian, and) : Organic and Inorganic Pyrophosphates as Shock-inducing Agents, 524
- Greene, J. W. : Chemistry and the War Effort, 583
- Greenidge, R. M. C. : Locating Buried Cables Electrically, 173
- Greenwood, Prof. Major : Budgetary and Dietary Surveys of Families and Individuals, 307
- Greenwood, Prof. Thomas : Etudes sur la connaissance mathématique, *review* by Prof. E. T. Whittaker, 268  
 Essais sur la pensée géométrique, *review* by Prof. E. T. Whittaker, 268  
 Prolégomènes à la théorie des quanta, *review* by Prof. E. T. Whittaker, 268
- Gregory, Joshua C. : Ancient Astrology, 512
- Gregory, Sir Richard : Eightieth Birthday of, 133
- Gridgean, N. T. : Mathematics of Biological Assay, 461
- Griffiths, Dr. W. T. : Trained Metallurgists in Industry, 553
- Grobman, A. : Awarded a Cressy Morrison Prize of the New York Academy of Sciences, 193
- Grodzinski, Paul : Appointed manager of the Research Department of the Diamond Trading Co., Ltd., 249
- Grooke, J. S. : Appointed forest officer (temporary), Tanganyika, 282
- Gross, Dr. F., and Raymont, J. E. G., and Marshall, Dr. S. M., and Orr, Dr. A. P. : A Fish-Farming Experiment in a Sea Loch, 483
- Grummitt, Oliver (edited by Burk, R. E., and) : The Chemistry of Large Molecules, *review* by Dr. D. D. Pratt, 270
- Grüneberg, H. : Genes and Development, 28
- Guardia, Dr. Rafael A. Calderón : Public Health in Costa Rica, 617
- Guggenheim, Dr. E. A. : Number of Configurations of Molecules Occupying Several Sites, 255, 406
- Gulland, Prof. J. Masson, Barker, G. R., and Jordan, D. O. : Structure of Nucleic Acid in the Dividing Cell, 20  
 Terminology of Nucleic Acids, 194
- Gustafsson, Dr. Ake, and Schröderheim, Johan : Ascorbic Acid and Hip Fertility in Rosa Species, 196
- Gutfreund, Herbert : Molecular Weight of Egg Albumin, 406
- H**
- HABERLER, Prof. G., and Hill, M. : Quantitative Trade Controls, their Causes and Nature, 411
- Haefely, Dr. : Plastics and Electrical Technology, 643
- Häggl, Prof. G. : Interpretation of Patterson Diagrams, 81
- Haggard, Prof. Howard W. : Vesalius and the Struggle for Intellectual Freedom, 707
- Halberstaedter, Dr. L. : Effects of X-Rays on Erythrocytes Irradiated *in vitro*, 683
- Haldane, Prof. J. B. S. : Mutation and the Rhesus Reaction, 106  
 Deductive Genetics, *review*, 234  
 Radioactivity and the Origin of Life in Milne's Cosmology, 555  
 Application of Genetics to Plant and Animal Breeding, 783
- Hall, N. F. : Appointed development advisor for West Africa, 18
- Hall, Dr. W. J. : Appointed assistant director of the Imperial Institute of Entomology, 649
- Hallimond, Dr. A. F. (Edge, A. Broughton, and) : Petrological Microscopes, 716
- Hamilton, Dr. John : *Obituary* of Dr. Birkett Wylam, 280
- Hamilton, Mrs. Mary Agnes : British Trade Unions, 553
- Hamilton, Prof. W. J., and Boyd, Prof. J. D. : Early Human Embryos, 694
- Hammond, Dr. J. : The Breeding of Cattle for Milk or Meat, 116
- Hammond, jun., John : Control of Ovulation in Farm Animals, 702
- Hampton, Dr. W. M., Bastick, R. E., and Wheat, W. N. : New Types of Optical Glass, 283
- Hance, Major-General J. B. : Medical Services for India, 646
- Hancock, B. J. : Appointed agricultural officer, Gold Coast, 51
- Hankey, Lord : Appointed chairman of a Government Committee on the Development of Television After the War, 135
- Hansel, C. W. : Apparatus used in the Teaching of Mathematics, 536
- Happold, Dr. Frank C., Chattaway, Dr. F. W., and Sandford, Dr. Mary : Microbiological Assay of Riboflavin, 225
- Happold, Dr. Frank C., and Sandford, Dr. Mary (Dolby, Doris E.) : Growth-Factors Required for the Nutrition of *Lactobacillus casei* s, 619
- Harcourt-Smith, Sir Cecil : *Death* of, 428 ; *obituary* by Sir John Myres, 487
- Hardie, C. D. : Post-War University Education, 57
- Hargreaves, Dr. A. : X-ray Analysis in Industry, 553
- Harington, Dr. C. R. : New Knowledge of the Biochemistry of the Thyroid Gland (Ninth Pedler Lecture of the Chemical Society), 312
- Harle, J. A., and Wild, R. W. : High-Voltage Circuit-Breaker Technique, 627
- Harman, R. A., and others : High Polymers, *review*, 665



- Harper, Francis : William Bartram of Philadelphia, Naturalist and Traveller, 648
- Harris, G. C. M. (Wilkins, W. H., and) : Estimation of the Anti-Bacterial Activity of Fungi that are Difficult to Grow on Liquid Media, 590
- Harris, Prof. H. A. : The Plasmion Bone, 715
- Harris, Prof. Robert S., and Thimann, Prof. Kenneth V. (edited by) : Vitamins and Hormones, Vol. 1, review by Dr. A. S. Parkes, 151
- Harrison, Dr. G. B. : Microdensitometry and Microsensitometry, 241
- Harrison, Prof. J. W. Heslop, and Jackson, G. A. D. : Ascorbic Acid and Hip Fertility in *Rosa Species*, 404
- Hart, Dr. P. M. D'Arcy : Tuberculosis and Pulmonary Disease, 783
- Hartridge, Prof. H. : Theories of Trichromatic Vision, 45  
Visibility of Blue and Yellow, 775
- Hartshorn, Dr. L. : Plastics and Electrical Technology, 641
- Hastings, Anna B. : Polyzoa (Bryozoa), I, Scrupocellariidae, Epistomiidae, Farciminariidae, Bicellariellidae, Aeteidae, Scrupariidae, 351; *erratum*, 431
- Hatcher, Dr. Robert A. : *Death of*, 738
- Hatschek, E. : *Death of*, 738
- Hatton, Dr. R. G. : Elected a fellow of the Royal Society, 370
- Hawker, Lillian E., and Singh, B. : Disease of Seedling Lilies, 466
- Hawkes, J. G. (Driver, C. M., and) : Photoperiodism in the Potato, 318
- Hawkins, E. G. E. (Hunter, Dr. R. F., and) : Vitamin A Aldehyde, 194
- Hawkins, J. C. : Photography as a Tool in Agricultural Research, 719
- Hawkins, Capt. T. H. : Language in the Making, review, 68
- Haworth, Prof. R. D. : Elected a fellow of the Royal Society, 370
- Haworth, Prof. W. N. : Elected president of the Chemical Society, 522  
Structure, Function and Synthesis of Polysaccharides, 785
- Health Education, Central Council for : Summer schools during 1944, 373
- Heilbron, Prof. I. M., and Bunbury, H. M. (edited by) : Dictionary of Organic Compounds, Vol. 2 : Ecaine—Myrtillin Chloride, Vol. 3 : Naphthacarbazole—Zygadenine, review, 668
- Heitler, W. and Peng, H. W. : Non-linear Optics and Electrodynamics, 532
- Henderson, J. H. : Appointed physiological laboratory superintendent, Nigeria, 51
- Henderson, James L. : World Student Relief, 152
- Henderson, Prof. Yandell : *Death of*, 280; *obituary* by Prof. C. G. Douglas, 308
- Hendricks, S. B. (Hill, W. L., Faust, G. T., and) : Forms of Phosphoric Oxide, 29
- Herget, Dr. Paul : Appointed director of Cincinnati Observatory, and professor and head of the Department of Astronomy in the University of Cincinnati, 163
- Hey, Dr. D. H. (Campbell, N. R., and) : *p*-Cresol and  $\alpha$ -Strone in Urine, 745
- Hickman, C. J., and Ashworth, D. : Botrytis spp. on Onion Leaves, 466
- Hilbert, Prof. D. (Courant, Prof. R., und) : Methoden der mathematischen Physik, Band I, Zweite verbesserte Auflage, Band 2, review by Prof. L. M. Milne-Thomson, 633
- Hildebrand, Prof. Joel H. : The Liquid State (Guthrie Lecture of the Physical Society), 492
- Hill, Prof. A. V. : Awarded the Joykissen Mookerjee Gold Medal for 1944 of the Indian Association for the Cultivation of Science, 708
- Hill, Dr. Bradford : Budgetary and Dietary Surveys of Families and Individuals, 307
- Hill, Dr. C. : *Obituary* of Dr. M. Radford, 217
- Hill, Dr. D. W. : Appointed deputy director of research to the British Cotton Industry Research Association, 19
- Hill, G. R., and Smyth, J. D. : Localization of Vitamin C in *Belascaris marginata*, 21
- Hill, Harry : Pasteurisation, review, 272
- Hill, Sir Leonard : *Obituary* of Dr. J. Argyll Campbell, 579
- Hill, M. (Haberler, Prof. G., and) : Quantitative Trade Controls, their Causes and Nature, 411
- Hill, Prof. W. C. Osman : An Undescribed Feature in the Drill (*Mandrillus leucophaeus*), 199
- Hill, W. L., Faust, G. T., and Hendricks, S. B. : Forms of Phosphoric Oxide, 29
- Hindley, Sir Clement : *Death of*, 581
- Hinks, Arthur R. : Awarded the Cullum Medal of the American Geographical Society, 431
- Hinton, Dr. H. E. : The Larvae of the Lepidoptera associated with Stored Products, 193
- Hobson, A. J. (Galloway, L. D., and) : Penicillin Dressings, 170
- Hockett, Dr. Robert C. : Appointed scientific director of the Sugar Research Foundation, 18; work of, 18
- Hodgson, Ernest A. : Bibliography of Seismology, Vol. 13, No. 13, 491
- Hoerr, Prof. Norman L. (edited by) : Frontiers in Cytochemistry, review by Dr. F. Dickens, 327
- Hogben, Prof. Lancelot : Levine's Hypothesis of Maternal Iso-immunization, 222
- Höglund, Dr. Hans : On the Biology and Larval Development of *Leander squilla* (L.) forma typica de Man, 751
- Holland, Sir Thomas H. : To retire from the posts of principal and vice-chancellor of the University of Edinburgh, 489
- Hollander, N. F. (Riddle, O., and) : Scraggy and Ataxic Pigeons, 58
- Holmes, Prof. Arthur : The Foundations of the Deep, review, 389
- Holmes, R. W., and others : Geostatics, 716
- Holtrop, H. E. : Tricotyledony, 13
- Honeycombe, R. W. K. (Boas, W., and) : Thermal Fatigue of Metals, 494; *erratum*, 770
- Honigsmann, Dr. H. D. S. : *Obituary* by Dr. Otto Lowenstein, 74
- Hopkins, Sir Frederick Gowland : Elected to an honorary life membership of the New York Academy of Sciences, 163
- Hopwood, Dr. A. T. : Science and Art at the Royal Academy, 1944, 643
- Howard, Alexander L. : The British Elm Flora, 198  
The Sycamore Tree, 348  
The Oak Tree, 438  
The Cedar Tree, 595
- Hsu, M. K. (Chen, Dr. H. K., and) : A Thermolabile Accessory Growth-factor to Rhizobium, 21
- Hubble, Edwin : Direction of Rotation in Spiral Nebulae, 259
- Hudson, Dr. D. R. : Solubility of Silver in Mercury, 259  
Correlation of Thixotropic Setting with Density in Silver Amalgams, 562
- Huggins, Maurice L., and others : High Polymers, review, 665
- Hughes, Arthur J. : Portuguese Navigators, 105
- Hughes, Dr. E. B. : Technology of Tea, 339
- Hughes, Dr. E. D. : Electronic Theory in Chemistry, review, 510
- Hughes, Dr. L. E. C. : Area Heating, 27  
Wave Filters, review, 635
- Hulbert, H. M., and others : High Polymers, review, 665
- Hulme, E. W. : On the Pedigree and Career of Benjamin Huntsman, Inventor in Europe of Crucible Steel, 104
- Hunter, Dr. A. : Microdensitometry and Microsensitometry, 242; *erratum*, 282  
Origin of the Solar System, 255  
Solar Phenomena and some Allied Geophysical Effects, 452
- Hunter, Dr. Donald : Industrial Poisons, 412
- Hunter, J. G. : Composition of the Bracken Frond throughout its Growing Season, 656
- Hunter, Dr. L., and Rees, H. A. : Tautomerism of Cyanamide, 284
- Hunter, Dr. R. F., and Hawkins, E. G. E. : Vitamin A Aldehyde, 194
- Huntsman (Benjamin), On the Pedigree and Career of, Inventor in Europe of Crucible Steel (E. W. Hulme), 104
- Hurst, H. E., and Black, R. P. : Rainfall in the Nile Basin (The Nile Basin, Vol. 6), 616
- Hurt, E. F. : Oil from the Sunflower Plants, 248
- Hutton, Prof. J. H. : Truth in Anthropology, 624
- Huxley, Prof. Julian S. : Evolutionary Ethics, review by J. S. L. Gilmour, 94  
Behaviour of the Song Sparrow and other Passerines, 144  
TV A, Adventure in Planning, review by R. Brightman, 508  
Application of Genetics to Plant and Animal Breeding, 783
- Huxley, L. G. H. (Jackson, Willis, and) : Transmission-Line Problems and the Impedance Circle Diagram, 319
- ILLING, Prof. V. C. : Awarded the Murchison Medal of the Geological Society, 134
- Illuminating Engineering Society : Annual Report for 1943, 647  
E. Stroud elected president, 647
- Imms, Dr. A. D. : Insects of Medical Importance, review, 96  
Control of St. John's Wort in Australia, 785
- Imperial Agricultural Bureau : G. H. Cressy elected chairman, 403
- Imperial Chemical Industries, Ltd. : Work of (Lord McGowan), 296
- Imperial College and the Massachusetts Institute of Technology : Interchange of staff and postgraduate students, 104
- Imperial College Union : Ninth Annual Report of its Vacation Work Scheme, 401
- Imperial Institute : A Review of Geological Survey Work in the Colonies, 582
- India, Governor-General of : Sir Ardeshir Dalal appointed a member of the Executive Council of the, 708
- Indian Association for the Cultivation of Science : Dr. Bimala Churn Law Gold Medal awarded to Sir Henry Dale, 679  
Joykissen Mookerjee Gold Medal for 1944 awarded to Prof. A. V. Hill, 708
- Indian Science Congress : Nature of the Golgi Element (Presidential Address to the Section of Zoology and Entomology by Prof. Vishwa Nath), 553  
Geographical and Geological Features of Bombay Island (Presidential Address to the Section of Geology and Geography by Dr. A. S. Kalapesi), 565
- Industrial Research, with special reference to India (Presidential Address to the Section of Engineering and Metallurgy by J. J. Ghandy), 624  
Truth in Anthropology (Presidential Address to the Section of Anthropology and Archaeology by Verrier Elwin), 624
- Cold Dense Matter (Presidential Address to the Section of Physics by Dr. D. S. Kothari), 658
- Medical Education (Presidential Address to the Section of Medical and Veterinary Sciences by Dr. K. V. Krishnan), 653
- Effects of Carbon Dioxide on the Heart and Circulation (Presidential Address to the Section of Physiology by Dr. S. N. Mathur), 686
- Food Production in India (Presidential Address to the Section of Agriculture by Ras Bahadur Dr. D. V. Bal), 750
- Industrial Health Research Board : Pamphlet No. 1 on Ventilation and Heating : Lighting and Seeing, 50
- Inglis, Prof. C. E. : Gyroscopic Principles and Applications, 278
- Inglis, J. Gall (Norton, Arthur P., and) : A Star Atlas and Reference Handbook (Epoch 1950), ninth edition, review, 8
- Ingold, Prof. C. T. : Appointed to the University of London chair of botany tenable at Birkbeck College, 552; work of, 552  
A Memoir on some Boletaceae, review, 667  
New Species of Aquatic Hyphomycetes, 717
- Instrument Technology, Society of : Formation of, 739
- Internal Combustion Engine Manufacturers' Association : Memorandum on Post-War Industrial Reconstruction, 76
- International Affairs, Royal Institute of : Occupied Europe—German Exploitation and its Post-War Consequences, 636
- Iron and Steel Institute : Review of the Work of the Joint Research Committees 1924-1943 of the Iron and Steel Institute and the British Iron and Steel Federation (Special Report No. 29), 291  
Bessemer Gold Medal for 1944 awarded to Essington Lewis, 431  
Report on the Training of Metallurgists, with special reference to the Iron and Steel Industries, 753
- Iverson, Johs. : Landnam i Danmarks Stenalder, 511
- JACKSON, Dr. A. R. : *Obituary* by Dr. W. S. Bristowe, 613
- Jackson, G. A. D. (Harrison, Prof. J. W. Heslop, and) : Ascorbic Acid and Hip Fertility in *Rosa Species*, 404
- Jackson, Dr. L. C. : Wave Filters, review by Dr. L. E. C. Hughes, 635
- Jackson, Willis, and Huxley, L. G. H. : Transmission-Line Problems and the Impedance Circle Diagram, 319
- James, R. R. : History of English Ophthalmology, 384
- Jánossy, Dr. L. : Rate of *n*-fold Accidental Coincidences, 165, 592
- Jánossy, Dr. L., and Rochester, G. D. : Radiation Producing Penetrating Showers, 259
- Jakes, L. B. : Fibrinogen, 58
- Jarratt, Sir William : U.S. National Patent Planning Commission, 12

- Jatkar, S. K. Kulkarni : Relationship between Dielectric Constant of Liquids and Solids and Dipole Moments, 222  
Dipole Moments of Polyatomic Molecules, 316
- Jay, B. Alwyn (Boulton, E. H. B., and) : British Timbers, *review*, 477
- Jeans, Sir James : The Borderland between Physics and Music, *review*, 357
- Jefferson and the Scientific Trends of his Time (Dr. Charles A. Browne), 584
- Jeffrey, Dr. G. A. : X-ray Analysis in Industry, 533
- Jeffreys, Dr. Harold : Origin of the Solar System, 140
- Jenkin, Prof. T. J. : Application of Genetics to Plant and Animal Breeding, 780
- Jenkinson, J. R. (Rylands, J. R., and) : Bonded Deposits on Economizer Heating Surfaces, 29
- Jennings, M. A., and Philpot, Flora J. (Florey, Prof. H. W.,) : Claviformin from *Aspergillus giganteus* Wehm., 139
- Jephcott, H. : Elected chairman of the Therapeutic Corporation of Great Britain for 1944, 79
- Jewett, Dr. F. B. : The Promise of Technology, 502
- Jóhannesson, Prof. Alexander : Gesture Origin of Indo-European Languages, 171
- Johnsen, F. A., and others : Prominent Treatment of Leprosy, 465
- Johnson, Dr. M. L. : Research in Social Organization, *review*, 269
- Johnson, R. N. : Appointed administrative officer to the British Leather Manufacturers' Research Association, 492
- Johnson, T., and Newton, Margaret : Inheritance of a Mutation in Wheat Rust, 319
- Jolliffe, Prof. A. E. : *Death of*, 370 ; *obituary by* S. T. Shovelton, 488
- Jones, A. G. : Budgetary and Dietary Surveys of Families and Individuals, 307
- Jones, D. Caradog : Budgetary and Dietary Surveys, 306
- Jones, Prof. F. Wood : The Antiquity of Man in Australia, 211  
The Black Redstart, 747
- Jones, Sir Harold Spencer : An Unscientific History of Scientific Thought, *review*, 67  
Metals in the Stars (May Lecture of the Institute of Metals), 163  
Measuring the Distance of the Sun from the Earth, 181  
Elected an honorary member of the American Astronomical Society, 193  
Variation of Latitude at Greenwich, 1936-40, 319
- Jones, J. Morgan : Appointed Welsh Secretary of the Ministry of Agriculture, 18 ; work of, 18
- Jones, J. M. : Caribbean Laboratory, 691
- Jones, Prof. O. T. : Geology for Engineers, *review*, 476
- Jones, R. Forbes : *p*-Aminobenzoic Acid and its Effect on the Sulphanilamide Inhibition of the Growth of Oat Roots, 379
- Jones, Valerie May (Wood, E. J. Ferguson, and) : Seaweed Products in Australia, 263
- Jones, W. Hope : More Mathematical Geography, 536
- Jones, W. R. : Minerals in Industry, *review by* V. A. Eyles, 668
- Jordan, D. O. (Gulland, Prof. J. Masson, Barker, G. R., and) : Structure of Nucleic Acid in the Dividing Cell, 20  
Terminology of Nucleic Acids, 194
- Joshi, Prof. S. S., and Deo, P. G. : Light-Effect in Chlorine under Electrical Discharge ; Influence of the Gas Pressure, 434
- Joy, Dr. Norman H. : Wind and Bird Migration, 135
- Juday, Prof. Chancey : *Death of*, 706
- Jullander, Ingvar, and Svedberg, Prof. The : The Osmotic Balance, 523
- Junner, Dr. N. R. : Awarded the Lyell Medal of the Geological Society, 134
- K**
- KAISER, C. P. (Frye, J. C., and) : Geology in the Present War, 583
- Kai-Shek, Madame Chiang : Elected an honorary member of the Institute of Metals, 163
- Kalapesi, Dr. A. S. : Geographical and Geological Features of Bombay Island, 565
- Kalmus, Dr. H. : Eye Responses of *Drosophila* Mutants, 465  
Action of Inert Dusts on Insects, 714
- Kalra, A. N. (Rahman, K. A., and) : Tent Caterpillar in India, 113
- Kansas Academy of Science : Symposium on Science and the War, 583
- Kapitza, Prof. F. : Elected an honorary member of the Institute of Metals, 163  
Awarded a Franklin Medal for 1944, 741
- Kawerau, E., and Fearon, W. R. : Thiourea as Protective Agent for Vitamin C, 384
- Kay, A. W. : Treatment of Shock by Heat, 271
- Kay, Prof. H. D. : Milk Distribution, *review*, 476
- Kaye, Maurice A. G. (Wormell, Dr. R. L., and) : Reaction between Proteins and Formaldehyde, 525
- Kearney, Prof. J. J. : The Veterinarian and the Colonies, 60
- Keen, Dr. K. A., and Worthington, Dr. E. B. : Return to England from the Middle East Supply Centre, 708
- Keener, Kenneth B. : The possible effect of Earthquakes in the building of the Shasta Dam, 491
- Keilin, Prof. D., and Mann, Dr. T. : Activity of Purified Carbonic Anhydrase, 107
- Keith, Sir Arthur : Pre-Neanderthal Man in the Crimea, 515  
Evolution of Modern Man (*Homo sapiens*), 742
- Kemsley, Lord : Gift to the University of Sheffield to provide an annual travelling fellowship, 679
- Kendall, Prof. James : The New Order in Inorganic Chemistry, *review*, 358
- Kendall, James T. : 'Magnetic' Current, 157
- Kendall, M. G. : Statistics of Literary Vocabulary, *review*, 570
- Kenner, G. W., and others : Reactions of Amidines with derivatives of Malonic Acid, 59
- Kenneth, J. H. : Gestation Periods, a Table and Bibliography, 162
- Kent, Dr. P. E. : Kilimanjaro, an Active Volcano, 454
- Kermack, Dr. W. O. : Elected a fellow of the Royal Society, 371
- Kerota, L. G. : A Gas-Tube Harmonic Generator, 89
- Kerr, Sir John Graham : Medicine and Education, 133  
White Plumage of Sea-Birds, 347
- Kessel, L. (Longland, C. J., and) : The Airborne Surgical Unit, 429
- Kidd, Dr. Franklin : Preservation of Foods by Drying, 100  
Elected a fellow of the Royal Society, 371
- Kimball, Dr. James H. : *Death of*, 399
- Kimmins, D. E. : Keys to the British Species of Aquatic Megaloptera and Neuroptera, 741
- Kind, Dr. F. : Petroleum Refining as a Chemical Industry, 660
- King, Lieut.-Colonel A. J., and others : Sulphur-containing Amino-Acids and Jaundice, 773
- King, George : Degree of D.Sc. of the University of London conferred on, 282
- King, Dr. Harold : *Obituary of* Dr. F. L. Pyman, 189
- King's College, London : Prof. T. A. Bennet-Clark appointed to the chair of botany, 552
- Kingston, Dr. C. B. : *Death of*, 159
- Kinnear, N. B. : *Obituary of* H. F. Witherby, 17  
*Obituary of* C. B. Rickett, 677
- Kleinzeller, Dr. A. : Fat Metabolism, *review*, 510
- Knappes, G. G. (Buchthal, Dr. Fritz, Deutsch, Adam, and) : Adenosine-triphosphate Initiating Contraction and Changing Bi-refringence in Isolated Cross Striated Muscle Fibres, 774
- Knoche, Walter : Ideas sobre los fundamentos Bioclimaticos y Biogeographicos para una Colonizacion Europea, 192  
L. Accion humana como una causa posible de liberar Movimientos sismicos, 219
- Knott, Prof. F. A. : *Obituary of* Prof. J. W. H. Eyre, 398
- Knowles, P. F. : Inheritance of Awn Barbing in Wheat, 258
- Kodak, Ltd. : New Types of Optical Glass, 559
- Kolthoff, Prof. I. M., and Sandell, Prof. E. B. : Textbook of Quantitative Inorganic Analysis, revised edition, *review*, 730
- Kothari, Prof. D. S. : Cold Dense Matter, 658
- Kothari, Prof. D. S. (Auluck, F. C., and) : The Hole Theory of Liquids, 777
- Kraitchik, Prof. Maurice : Mathematical Recreations, *review*, 271
- Krieger, Herbert W. : Island Peoples of the Western Pacific, Micronesia and Melanesia, 340
- Krishnan, Dr. K. V. : Medical Education, 658
- Kroeber, Dr. Alfred L. : Elected to an honorary life membership of the New York Academy of Sciences, 163
- Kruse, Dr. Walther : *Death of*, 48
- Krylov, Dr. N. : Relaxation Processes in Statistical Systems, 709
- Kuk-Meiri, S. (Fodor, P. I., and) : Nature of Peptones, 250
- Kulischer, Prof. E. M. : The Displacement of Population in Europe, 148
- Kundu, B. C. : Multiperforate Plates in Xylem Vessels of Monocotyledon Roots, 58
- Kungl. Karolinska Medico-Kirurgiska Institutet : To build a Medical Nobel Institute, 615
- L**
- LA COUR, L. F. (Lewis, D., and) : Collection of Pollen and Artificial Wind Pollination, 167
- Lacey, Dr. M. S. (Cook, Dr. A. H., and) : An Antibiotic from *Aspergillus parasiticus*, 460
- Ladell, Dr. W. S. S. : Effect of Drinking Small Quantities of Sea Water, 385
- Lahiri, Dr. A. : Age of the Saline Series in the Salt Range of the Punjab, 654
- Lallemant, Gustavo Avé : La electrometria, 77
- Lamb, A. F. A. : Appointed senior assistant conservator of forests, British Honduras, 249
- Lamy, R. : Genotypes of Different Strains of *Drosophila pseudo-obscura*, 531
- Lang, W. Y. : Teletypewriter Test Set, 161
- Langmuir, Dr. Irving : Elected an honorary member of the Institute of Metals, 163  
Awarded the Faraday Medal of the Institution of Electrical Engineers, 190 ; work of, 190
- Lapage, Dr. G. : Cleansing of Milk Bottles, 31  
Ox Blood for Blood Transfusion, 145  
Ophthalmology in Great Britain, 383  
Industrial Poisons, 412  
Control of Typhus, 536  
Parasitic Diseases of Man in relation to the War, 625  
Medical Education in India, 658  
The Hygiene of the Eighth Army in North Africa, 688  
Tuberculosis and Pulmonary Disease, 783
- Lardy, Henry A., and Phillips, Dr. Paul H. : Acetate Utilization for Maintenance of Motility of Bull Spermatozoa, 168
- Laubengayer, A. W. (Bauer, S. H., Finlay, G. R., and) : Dimethyl Ether Compound with Boron Trifluoride, 114
- Lavoisier : Statute in Paris, 311
- Lawrence, W. J. C. : Soil Sterilization, 737  
Application of Genetics to Plant and Animal Breeding, 783
- Lazar, D. E. (Catchside, Dr. D. G., and) : Ionization and Chromosome Breakage, 465
- Leach, S. J., and Daniels, V. A. (Branker, A. V.,) : A Modification to the Cryoscopic Equation, 407
- Leah, Dr. A. S. : Abnormal Dissociation in Flame Gases, 23
- Leak, Dr. W. N. : A Simple Technique for Photomicrography, 563
- Leather Manufacturers' Research Association, British : R. N. Johnson appointed administrative officer, 492
- Ledingham, Sir John : Title of professor emeritus of bacteriology in the University of London conferred on, 282
- Lees, G. M. : Age of the Saline Series in the Salt Range of the Punjab, 654
- Lees, H., and Quastel, Dr. J. H. : Soil Sterilization, 738
- Leiguarda, Ramon Hector (Monteverde, José Julio, and) : A New Antigen of Salmonella, 589
- Lester-Garland, L. V. : *Death of*, 488 ; *obituary by* Dr. J. Ramsbottom, 613
- Leutritz, J. : Testing Wood Preservatives, 441
- Lewis, Dr. D. : Physiology of Incompatibility in Plants, 258  
Incompatibility in Plants, 575
- Lewis, Dr. D., and La Cour, L. F. : Collection of Pollen and Artificial Wind Pollination, 167
- Lewis, Essington : Awarded the Bessemer Gold Medal for 1944 of the Iron and Steel Institute, 431
- Library Association : The Subject Index to Periodicals, 1942, *review*, 635
- Lidwell, O. M., and Raymond, W. F. (Lovelock, J. E.) : Aerial Disinfection, 20  
Vaporization of Lactic Acid as an Aerial Bactericide, 743
- Lindblad, —, and Ohman, —, : Direction of Rotation in Spiral Nebulae, 259
- Lindsay, A. D. : Religion, Science and Society in the Modern World, *review by* F. Ian G. Rawlins, 150
- Lindvall, Sven, and Tiselius, Prof. Arne (Runnström, Prof. John) : Gamones from the Sperm of Sea Urchin and Salmon, 285 ; *erratum*, 649

- Linnean Society of London : Presidential Address by A. D. Cotton on The Megaphytic Habit in the African Tree Senecios and other Genera, 679
- Election of officers for 1944-45, 679
- Linton, R. D. : Appointed senior agricultural officer, Tanganyika, 741
- Lipman, C. L. (Golds, L. B. S., and) : A Modern Earth-Fault Relay Equipment for use on Systems Protected by Petersen Coils, 469
- Lipschütz, Dr. Alexander : Chemical Structure and Antifibromatogenic Activity of Steroid Hormones, 260  
Awarded the Charles L. Mayer Prize of the U.S. National Academy of Sciences, 614 ; work of, 614
- Lipson, Dr. H. : X-ray Analysis in Industry, 533
- Lister Institute of Preventive Medicine : Retirement of Sir John Ledingham from the professorship of bacteriology, 282
- Listowel, Lord : Functional Collaboration in Colonial Territories, 159
- Liu, C. K. : Sodium Sulphate as an Agent Causing the Development of the Chloride-secreting Cells in Macropodus, 252
- Lockley, R. M. : Dream Island Days, review by Sir D'Arcy Thompson, 270
- Lockwood, E. H. : Reform of School Mathematical Syllabuses, 536
- London Chamber of Commerce : Report on Scientific Industrial Research, 294
- London School of Hygiene and Tropical Medicine : Week-end course for medical practitioners on Factory Medical Services and Industrial Diseases, 312  
Prof. J. M. Mackintosh appointed to the University chair of public health, 431
- Longland, C. J., and Kessel, L. : The Airborne Surgical Unit, 429
- Longuet-Higgins, H. C. : Structure of the Nitrogen Peroxide Molecule, 408 ; *erratum*, 459
- Longuet-Higgins, H. C., and Bell, R. P. : Structure of Boron Hydrides, 59
- Lonsdale, Dr. Kathleen : and, and Raymond, W. F. : Aerial Disinfection, 20  
X-Ray Divergent-Beam Photography as a Test of Crystal Perfection, 433  
Diamonds, Natural and Artificial, 669
- Lougher, Miss E. T., and Rowlands, Dr. S. : Radioactivity in Osmium, 374
- Loutit, Dr. J. F. : Human Blood Groups, 97
- Lovelock, J. E., Lidwell, O. M., and Raymond, W. F. : Aerial Disinfection, 20
- Vaporization of Lactic Acid as an Aerial Bactericide, 743
- Lowenstein, Dr. Otto : *Obituary* of Dr. H. D. S. Honigmann, 74
- Lucas, Dr. C. E. : Excretions, Ecology and Evolution, 378
- Lugeon, Prof. M. : Elected a foreign member of the Royal Society, 770
- Lundblad, O. : Studies of Hydracarina, 113
- Lundegårdh, H., and Stenlid, G. : Physico-Chemical Properties of the Surface of Growing Plant Cells, 618
- Lundmark (Strömberg) and) : Re-discovery of Comet Schaumasse, 522
- Luria, G., and Delbrück, M. : Mutations in Bacteria, 717
- Lyle, Sir Thomas Ranken : *Death of*, 428 ; *obituary* by Dr. J. I. O. Masson, 518
- Lythgoe, B., and others : Reactions of Amidines with derivatives of Malonic Acid, 59
- Lythgoe, B., and Todd, A. R. (Baddiley, J.) : Synthesis of Adenine, 59
- Lyttleton, R. A. : Origin of the Planets, 592
- MAANAN, A. VAN** : Stars with Large Proper Motions, 585
- McAfee, Dr. Alexander G. : *Obituary*, 488
- Macalister, Prof. Alexander (1844-1919), 554
- McArthur, Dr. I. : X-ray Analysis in Industry, 533
- McBurney, D. A. : Appointed agricultural officer, Sierra Leone, 51
- MacCallum Prof. W. G. : *Obituary* by Dr. J. D. Rolleston, 581
- McCance, Dr. Andrew : Application of Research in Industry, 458
- McCance, Dr. R., and Widdowson, Dr. E. M. : Activity of the Phytase in Different Cereals and its Resistance to Dry Heat, 650
- McCellan, Wilbur D. : Powdery Mildew of the Rose, 162
- McCConnell, J. : Non-linear Optics and Electrodynamics, 532
- McCrea, Prof. W. H. : Solar Phenomena and some Allied Geophysical Effects, 452
- MacCurdy, Dr. J. T. : The Structure of Morale, review by Dr. Joseph Geoghegan, 66
- MacDonald, A. S. (Woods, R. C., and) : Staff Selection by Scientific Methods, 741
- Macelwane, Rev. James B. : Fifteen Years of Geophysics, a Chapter in the Exploration of the United States and Canada, 1924-1939, 503
- McFarlane, Marjory N., and others : Recognition of a Further Common Rh Genotype in Man, 52
- McGonagle, Moira P. : Cultures of Excised Leguminous Roots, 528
- McGowan, Lord : Work of Imperial Chemical Industries, Ltd., 296
- Mellin, Henry : Origin and Action of Drugs, 300
- McIntosh, D. : Appointed senior assistant conservator of forests, Nigeria, 492
- Mackenzie, Prof. : University of Colorado Studies, Vol. 2, 61
- Mackenzie, A. E. E. : Reform of School Mathematical Syllabuses, 536
- McKie, Dr. Douglas : Wöhler's 'Synthetic' Urea and the Rejection of Vitalism - a Chemical Legend, 608
- Mackie, Dr. T. T. : Parasitic Diseases, 626
- Mackinder, Sir Halford : Awarded the Charles P. Daly Medal of the American Geographical Society, 431
- Mackintosh, Prof. J. M. : Appointed to the University chair of public health at the London School of Hygiene and Tropical Medicine, 431
- Mackintosh, Dr. N. A. : The Southern Stocks of Whalebone Whales, review by F. C. Fraser, 569
- McLaren, D. I. : Organization of Agricultural Machinery Instruction, 117
- MacLeshore, Dr. James : *Obituary* by Dr. W. R. Cunningham, 47
- Macmillan (1843-1943) : The House of (Charles Morgan), review by Sir John Myres, 122
- McMillan, J. H. : The Place of Physics in the War Effort, 583
- MacMurray, Prof. John : Appointed professor of moral philosophy in the University of Edinburgh, 679
- McPhail, Prof. M. K. : Trypan Blue and Growth of the Adrenal Cortex in Mice, 460
- McSwiney, Prof. B. A. : Elected a fellow of the Royal Society, 371
- McWilliam, A. S. : Agricultural Education, 116
- Madrid Observatory : Work of the, 678
- Mahajan, Dr. G. S. : An Introduction to Pure Solid Geometry, second edition, review, 271  
Lessons in Elementary Analysis, third edition, review, 272
- Makings, Dr. S. M. : The Economics of Poor Land Arable Farming, review, 757
- Mance, Brig.-General Sir Osborne : International Telecommunications, 567
- Mance, Brig.-General Sir Osborne, assisted by Wheeler, J. E. : International Air Transport, review by Capt. J. L. Pritchard, 417
- Manchester Chamber of Commerce : Lectures on Science and Industry in Great Britain, 337, 371, 458, 520
- Mann, F. H. (Cooper, W. Fordham, and) : Industrial Fire Risks, 248
- Mann, Dr. T. (Keilin, Prof. D., and) : Activity of Purified Carbonic Anhydrase, 107
- Mansfield, W. S. : Breeding of Dual-Purpose Cattle, 172
- Marcus, E. : Studies of Bryozoa, 114
- Mardles, Dr. E. : Flocculation in Solutions and Suspensions, 745
- Margary, I. D. : *Obituary* of S. E. Winbolt, 518
- Margolis, A. E. : Area Heating, 27
- Mark, H., and others : High Polymers, review, 665
- Marrion, Prof. G. F. : Elected a fellow of the Royal Society, 371
- Marsh, R. W. : Elected president for 1944 of the British Mycological Society, 51
- Marshall, A. J. : Display and Bower-building in Bower-birds, 685
- Marshall, C. W. : British Electric Power Station Practice, review, 729
- Marshall, Major James : The Rapid Treatment of Syphilis, 187  
A History of Epidemic Diseases, review, 475  
Languages, Natural and Artificial, review, 729
- Marshall, Major J. (Beattie, Prof. J., and) : Methionine in the Treatment of Liver Damage, 525
- Marshall, Sir John : Awarded the Gold Medal of the Royal Asiatic Society, 522
- Marshall, Roy K. : Planetaria of the World, 191, 616
- Marshall, Dr. S. M., and Orr, Dr. A. P. (Gross, Dr. F., and Raymont, J. E. G., and) : A Fish-Farming Experiment in a Sea Loch, 483
- Martin, Edward A. : *Obituary* by Capt. T. Danneuther, 159
- Martin, G. : Competitive Rubber Plants, 212
- Marvel, Prof. Carl Shipp : Elected president of the American Chemical Society for 1945, 34  
Awarded the 1944 William H. Nichols Medal of the New York Section of the American Chemical Society, 134, 583 ; work of, 134, 583
- Marvin, F. S. : *Obituary* by Dr. C. H. Desch, 47
- Mason, W. P. : Frequency Performance of Quartz Plates, 598
- Mass Observation (A Report by) : War Factory, review by Prof. T. H. Pear, 178
- Massachusetts Institution of Technology and the Imperial Institute : Interchange of staff and postgraduate students, 104
- Masson, Dr. J. I. O. : *Obituary* of Sir Thomas Ranken Lyle, 518
- Mathematical Association : Meeting on the Reform of School Mathematical Syllabuses, 535
- Election of officers, 536
- Mather, Dr. K. : Genetical Control of Incompatibility in Angiosperms and Fungi, 392  
*Obituary* of Dr. C. B. Davenport, 644  
Specific Differences in Petunia, 661  
Application of Genetics to Plant and Animal Breeding, 781
- Mather, Dr. K., and Edwards, P. M. J. : Specific Differences in Petunia, 661
- Matheson, Dr. R. : Parasitic Diseases, 626
- Mathews, Prof. Edward B. : *Death of*, 645
- Mathur, Dr. S. N. : Effects of Carbon Dioxide on the Heart and Circulation, 686
- Matthews, Dr. Bryan H. C. : Human Limits in Flight, 698
- Matthews, Vera, review, W. R. : Science and Religion, review, 38
- Maury, Miss Antonia C. : Awarded the Annie J. Cannon Prize of the American Astronomical Society, 220
- Mawson, C. A. (Benesch, R., Barron, N. S., and) : Carbonic Anhydrase, Sulphonamides and Shell Formation in the Domestic Fowl, 138
- Maxfield, G. W. (Biles, R. W., and) : Performance of Generating Plant, 281
- Mears, Prof. Eliot G. : Counterpart of the Davidson Currant, 345
- Medical Laboratory Technology, Institute of : Memorandum and Articles of Association, 615
- Medical Research Council : War Memorandum No. 9 on the Determination of Blood Groups, review by Dr. J. A. Fraser Roberts, 95  
Committee on Non-Ionizing Radiations, 219  
Establishment of a Unit for Research in Human Nutrition, 249  
Establishment of an Otological Research Unit, 522  
A Provisional Classification of Diseases and Injuries for Use in Compiling Morbidity Statistics (Special Report Series No. 248), 584  
Unit for Research in Applied Psychology established at Cambridge, 617  
War Memorandum No. 12 on the Use of Penicillin in Treating War Wounds, 767
- Mees, Dr. C. E. Kenneth : The Theory of the Photographic Process, review by Prof. N. F. Mott, 632
- Mehlquist, G. H. L., Blodgett, C. O., and Bruscia, L. : Application of Colchicine to *Delphinium cardinale*, 28
- Melling, S. Ernest : Elected president of the Society of Public Analysts and other Analytical Chemists, 340
- Melmore, Sidney : Ice-Crystal Haloes, 166
- Melville, Prof. H. W. : Practical Physical Chemistry, review, 696
- Melville, Dr. Ronald : The British Elm Flora, 198  
Ascorbic Acid and Hip Fertility in Rosa Species, 404
- Melville, Dr. Ronald, and Dade, H. A. : Chalk Brood Attacking a Wild Bee, 112
- Mental Hygiene, National Council for : Course of lectures on the Psychology of Frustration and Fulfilment in Adolescence, 79
- Mercado, Dr. M. (Ginés, Dr. A. R., Alvarez, Dr. A., and) : Tuberculosis in Paraguay, 248
- Merrill, Dr. E. D. : Emergency Food Plants and Poisonous Plants of the Islands of the Pacific, 19
- Mersey-side Naturalists' Association : Portfolio Vol. 2, 161
- Mess, Dr. H. A. : *Death of*, 159 ; *obituary* by Mrs. Gertrude Williams, 273
- Metals, Institute of : Election of honorary members, 163  
May Lecture to be delivered by Sir Harold Spencer Jones, 163  
Equilibrium Diagrams of Binary Alloy Systems, 220  
Presidential Address by Dr. W. T. Griffiths, 553  
Medal for 1944 awarded to Lieut.-Colonel the Hon. R. M. Preston, 553  
G. Shaw Scott and the, 614
- Metcalf, B. L. : Transmission and Distribution of Electricity in Mines, 219
- Methley, B. W., and Turner, H. J. : Solubility of Basic Open Hearth Slags, 778

- Middleton, H.: Systematic Qualitative Organic Analysis, second edition, review, 730
- Miles, H. W.: A National Advisory Service for Agriculture and Horticulture, 611
- Millington, G., and Cox, J. W. (Eckersley, T. L.): Ground and Cloud Scatter of Electromagnetic Radiation, 341
- Mills, E. D.: Design of Modern Industrial Chemical Laboratories, 459
- Mills, Ivor H. (Brambell, Prof. F. W. Rogers, and): Prenatal Mortality, 558
- Milne, Prof. E. A.: The Fundamental Concepts of Natural Philosophy, 304  
Obituary of Prof. H. F. Newall, 455  
Elected president of the Royal Astronomical Society, 492  
Cold Dense Matter, 658
- Milne-Thomson, Prof. L. M.: Harmonic Analysis, 536  
Mathematical Physics, review, 633
- Miners' Welfare Commission: Part-time Day Advanced Mining Scholarships, 492
- Miners' Welfare National Scholarship Scheme: Principal J. F. Rees appointed a member of the selection committee, 79  
Retirement of Prof. J. F. Duff from the selection committee, 79
- Mirsky, Dr. A. E. (Pollister, Prof. A. W., and): Distribution of Nucleic Acids, 711
- Misiak, Henryk, and Pickford, Dr. R. W.: Physique and Perseveration, 622
- Moir, J. Reid: Death of, 280; *obituary* by Miles C. Burkitt, 369  
von Mollendorff, Prof. Wilhelm: Death of, 677
- Molloy, Dr. Daniel M.: Death of, 677
- Molloy, M. A.: Appointed a senior veterinary officer, Tanganyika, 741
- Monné, Dr. Ludwik, and Wicklund, Miss Elsa (Runnström, Prof. John): Mechanism of Formation of the Fertilization Membrane in the Sea Urchin Egg, 313
- Montagu, Prof. M. F. Ashley: An Early Swanscombe Skull, 347  
Man's Most Dangerous Myth—The Fallacy of Race, review by Prof. H. J. Fleure, 604
- Monteverde, José Julio, and Leiguarda, Ramon Hector: A New Antigen of Salmonella, 589
- Moore, E. W. J.: Awarded a moiety of the Lyell Fund of the Geological Society, 134
- Moore, G. E.: The Philosophy of (edited by Paul Arthur Schilpp), review by H. P. Reichmann, 39
- Moore, Dr. Quintin, Wylie, Thos. Smith, and Conway, Frank G.: Science Class Lecture Ciné-Films, 784
- Moorhead, J. J., and Unger, L. J.: Red Blood Cells as Wound Dressings, 340
- Moorhouse, Miss M. S. (Taylor, Prof. N. B., and): Isinglass as a Substitute for Human Blood Plasma, 247
- Moran, Dr. T. (Drummond, Sir J. C., and): Unconsidered Trifles in our Diet, 99
- Morgan, Charles: The House of Macmillan (1843-1943), review by Sir John Myres, 122
- Morgan, Dr. W. T. J.: Transformation of Pneumococcal Types, 763
- Morley, B. D. Wragge: Classification of Ants, 321  
Inter-relations of Plants and Insects, 425
- Morris, C. S.: Effect of Temperature on the Reducing Activity of Leucocytes in Milk, 436
- Morris, Sir Henry (1844-1926), 51
- Morris, P. R.: English Education, 372
- Morton, Dr. R. A.: Chemical Aspects of the Visual Process, 69
- Morton, Dr. R. A., and Goodwin, T. W.: Preparation of Retinene *in vitro*, 405
- Moss, L.: Budgetary and Dietary Surveys of Families and Individuals, 307  
Moss Exchange Club: Annual Reports of (Miss Eleonora Armitage), 768
- Mott, Prof. N. F.: Research on the Photographic Process, review, 632
- Moulton, Dr. H. G.: Science and Government, 18
- Moy-Thomas, Flight-Lieut. J. A.: *Obituary* by Prof. E. S. Goodrich, 427
- Moyal, J. E.: Deformation of Rubber-like Materials, 777
- Mundell, Dorothy B.: Plasma Cholinesterase in Male and Female Rats, 557
- Muskett, A. E. (Calvert, E. L., and): Blind Seed Disease of Rye-Grass, 287
- Mustafa, Ahmed (Schönberg, Prof. Alexander, and): Reactions of Ethylenes with 1,2-Diketones in Sunlight, 195
- Mycological Society, British: R. W. Marsh elected president for 1944, 51  
Making a collection of reprints and pamphlets on Mycology and Plant Diseases for distribution after the War, 492
- Myers, Dr. Earl H.: Biology, Ecology and Morphogenesis of a Pelagic Foraminifer, 322
- Myres, Sir John: The House of Macmillan, review, 122  
*Obituary* of Sir Cecil Harcourt-Smith, 487  
*Obituary* of Lieut.-Colonel Stanley Casson, 613
- N**AGLER, Dr. F. P. O.: Bacteriological Diagnosis of Gas Gangrene due to *Clostridium oedematiens*, 496
- Naidus, H., and others: High Polymers, review, 665
- Nancarrow, H. A.: Plastics and Electrical Technology, 641
- Narayanamurti, Dr. D., and Ranganathan, V.: Studies on Adhesives, Part 4, Further Note on Prolamin Adhesives, 173
- Narayanamurti, Dr. D., Ranganathan, V., and Roy, D. C.: Preliminary Note on the Use of Sunn Hemp Seed Proteins as Plywood Adhesives, 173
- Nargund, K. S., and others: A Case of Total Asymmetric Synthesis, 141
- Nath, Prof. Vishwa: Nature of the Golgi Element, 553
- National Council for Mental Hygiene: Course of lectures on the Psychology of Frustration and Fulfillment in Adolescence, 79
- National Expenditure, Select Committee on: Seventeenth Report for 1942-43, 49  
Fourteenth Report, 231  
Third Report for the session 1943-44, 490
- National Institute of Sciences of India: Grant of 15,000 rupees from the Rockefeller Foundation, 617
- National Institute of Zoology and Botany of Academia Sinica: Research Activities during 1943, 410
- National Research Council of Canada: Twenty-fifth Annual Report, 1941-42, 262
- National Union of Teachers: Sex Teaching in Schools, 325
- National Veterinary Medical Association of Great Britain and Ireland: Discussion on the Improvement of Livestock, 117
- Nations, League of: Europe's Overseas Needs 1919-20 and How they were Met, 159  
Report for 1942-43, 768
- Nations, League of (Economic, Financial and Transit Department of the): Studies on International Trade and Commercial Policy, 411
- Neate, E. C., and Bowling, W. F.: Transmission Line Supports, 679
- Needham, Dr. Joseph: Elected an honorary member of the Science Society of China, 228  
Science and Technology in the North-West of China, 238  
Chungking Industrial and Mining Exhibition, 672
- Neville, Prof. E. H.: Report of School Mathematical Syllabuses, 535
- New South Wales, Technological Museum of: Annual Report for the Year 1942, 281
- New York Academy of Sciences: Election of honorary life members, 163  
A. Cressy Morrison Prizes awarded to W. A. Ritchie and to A. Grobman, 193  
Conference on Parasitic Diseases, 625  
To award two A. Cressy Morrison Prizes in Natural Science in December 1944, 770
- Newall, Prof. H. F.: Death of, 280; *obituary* by Prof. E. A. Milne, 455  
Newnham College, Cambridge: A Muriel Wheldale Onslow Prize awarded to Dr. A. B. Beakbane, 163
- Newton, H. W.: Solar Flares and Magnetic Storms, 452, 532
- Newton, Margaret (Johnson, T., and): Inheritance of a Mutation in Wheat Rust, 319
- Nice, Mrs. M. M.: Studies in the Life History of the Song Sparrow, 2, The Behaviour of the Song Sparrow and other Passerines, 144
- Nicol, Major C. S., and others: Sulphur-containing Amino-Acids and Jaundice, 773
- Nicol, Dr. Hugh: Application of the Principle of Maximum Effect, 623
- Nilsson, R.: The Pascal Arithmometer and Other Means to Solve Mathematical Problems, 247
- Nobbs, C. G.: Reform of School Mathematical Syllabuses, 536
- Noble, W. B.: Hessian Fly Resistance in Wheat, 465
- Norman, J. R.: Death of, 677; *obituary* by Dr. C. Forster-Cooper, 738
- Northern Industrial Group: Considerations Affecting Post-War Employment in the North-East, 505
- Norton, Arthur P., and Inglis, J. Gall: A Star Atlas and Reference Handbook (Epoch 1950), ninth edition, review, 8
- Notestein, F. W.: Some Implications of Population Change for Post-War Europe, 33
- Nuffield College, Oxford: Henry Clay appointed warden, 649  
Nuffield College Social Reconstruction Survey Education Sub-Committee: The Open Door in Secondary Education, 17
- Nutrition Society: Conference on Budgetary and Dietary Surveys of Families and Individuals, 306, 585  
Publication of Nos. 1 and 2 of the *Proceedings*, 678  
Nutrition Surveys, Committee on: List of Investigations, 522
- Nuttall, Dr. J. M.: *Obituary* of Dr. E. C. Scott Dickson, 645
- Nye, G. W.: Appointed director of agriculture, Nyasaland, 741
- O**ATES, F. (Teale, Sir Edmund, and): Mineral Resources of Tanganyika, 740
- Oberndorfer, Prof. S.: Death of, 677
- Obruchev, Prof. Vladimir A.: Order of Lenin conferred on, 75
- Ockrent, Dr. Charles: Appointed to the scientific staff of British Drug Houses, Ltd., 741
- O'Connell, Rev. Sir John: Death of, 159
- O'Doherty, J. J.: Diffusion Phenomena in Alternating Current Arcs, 558
- Odum, Howard W.: Race and Rumors of Race, review by Prof. H. J. Fleure, 667
- Ogden, C. K.: Basic for Science, review by Dr. Maxwell Garnett, 205
- O'Gorman, Lieut.-Colonel Mervyn: Road Accidents and Research, 623
- O'Grady, S. C., and others: Geostatics, 716
- O'Hara, Prof. Dwigid: Air-Borne Infection, review, 271
- Ohman (Lindblad) and: Direction of Rotation in Spiral Nebulae, 259
- Oliver, Prof. R. A. C.: Education and the World State, review, 755
- Olver, Sir Arthur: The Veterinarian and the Colonies, 60
- O'Malley, E. (Conway, Prof. E. J., and): Nature of the Cation Exchanges during Short-Period Yeast Fermentation, 555  
Formation of Hydrogen Ions in High Concentration by Ordinary Baker's Yeast, 652
- Onetto, Enrique: Undulant Fever in Chile, 617
- Orr, Dr. A. P. (Gross, Dr. F., and Rayment, J. E. G., and Marshall, Dr. S. M., and): A Fish-Farming Experiment in a Sea Loch, 483
- Orr, Sir John: Budgetary and Dietary Surveys of Families and Individuals, 306
- Osborn, E. M.: Antibacterial Substances in Green Plants, 598
- Osborn, Prof. Henry Fairfield: Proboscidea, Vol. 2, Stegodontoidea, Elephantoidea, review by Prof. D. M. S. Watson, 5
- Ostwald, Prof. Wolfgang: Death of, 677
- P**AGE, Harold: Awarded the Coopers Hill War Memorial Prize and Medal for 1943, 312
- Pagel, Dr. W.: J. B. Van Helmont (1579-1644), 675
- Paget, G. H., and others: Promin Treatment of Leprosy, 465
- Paget, Sir Richard A. S.: Origin of Indo-European Languages, 257, 381
- Paleontographical Society: Approaching centenary of the, 554
- Palanca, Prof. J. A.: Control of Typhus, 537
- Palit, Dr. S. R.: Solubilization of Dyes in Non-aqueous Solvents, 317
- Palmer, Prof. L. S.: *Obituary*, 518
- Palmer, R. M.: Appointed assistant conservator of forests, Sierra Leone, 51
- Pant, Dr. N. N. (Dhar, Prof. N. R., and): Nitrogen Loss from Soils and Oxide Surfaces, 115
- Paranjape, Miss K. D., and others: A Case of Total Asymmetric Synthesis, 141
- Parasinos, C. C.: Appointed agricultural officer, Northern Rhodesia, 51
- Parker, Eric: Oddities of Natural History, review, 8
- Parkes, Dr. A. S.: Vitamins and Hormones, review, 151  
Prenatal Mortality and the Birth-Rate, 245
- Parkes, Dr. G. D.: *Obituary* of Dr. F. D. Chattaway, 335
- Parliamentary and Scientific Committee: Memorandum on Taxation and Research, 338  
Annual Report for 1943, 428
- Parr, W. J.: *Obituary* of Frederick Chapman, 676

- Parson, A. L. : The So-called Plücker's Plane, 112  
 Parsons, G. L. : Reform of School Mathematical Syllabuses, 535  
 Parsons, Lieut.-Col. the Hon. R. M. : Awarded the Institute of Metals Medal for 1944, 553  
 Patent Planning Commission : U.S. National (Sir William Jarratt), 12  
 Patiño-Carmago, Prof. Luis : Control of Typhus, 537  
 Pavlovsky, Prof. Evgeni : Awarded the Order of Lenin, 400 ; work of, 400  
 Peacock, Dr. P. R. : Fluorescence as an Aid to Physiology, 136  
 Symposium on Cancer, review, 329  
 Pear, Prof. T. H. : Social Psychology in a War Factory, review, 178  
 Pearsall, Prof. W. H. : Appointed Quain professor of botany in University College, London, 340, 400 ; work of, 400  
 Pearce, Dr. Innes H., and Crocker, Lucy H. : The Peckham Experiment, review by Dr. M. L. Johnson, 269  
 Pearson, Claude E. : The Extrusion of Metals, review by Prof. F. C. Thompson, 696  
 Peddie, Prof. W. : Future of Quaternions, 85  
 Peirce, Dr. F. T. : Molecular Co-ordination in Cellulose, 586  
 Penfold, Dr. J. B. : Control of Typhus, 537  
 Peng, H. W. (Born, Prof. Max, and) : Statistical Mechanics of Fields and the 'Apeiron', 164  
 Peng, H. W. (Heitler, W., and) : Non-linear Optics and Electrodynamics, 532  
 Penicillin Committee : Constitution of, 401  
 Sir Henry Dale appointed chairman, 401  
 Pentelov, F. T. K. : Nature of Acid in Soft Water in relation to the Growth of Brown Trout, 464  
 Percy, Lord Eustace : Appointed chairman of a Departmental Committee on Technological Education in England and Wales, 458  
 Perutz, Dr. M. F. : *Obituary* of Dr. E. Granichstaden, 428  
 Peters, Prof. R. A., and others : Sulphur-containing Amino-Acids and Jaundice, 773  
 Pettit, E. : Solar Prominences, 29  
 Phalnikar, N. L., and others : A Case of Total Asymmetric Synthesis, 141  
 Phillip, Ursula : Crossing-over in the Males of *Drosophila subobscura*, 223  
 Phillips, Dr. Paul H. (Lardy, Henry A., and) : Acetate Utilization for Maintenance of Motility of Bull Spermatozoa, 168  
 Philpot, Flora J. (Florey, Prof. H. W., Jennings, M. A., and) : Claviformin from *Aspergillus giganteus* Wehm., 139  
 Photography (Scientific), Association for : Discussion on Photography as a Tool in Agricultural Research, 719  
 Physical Society : Guthrie Lecture to be delivered by Prof. Joel H. Hildebrand, 492  
 Election of officers for 1944-45, 708  
 Prof. E. N. da C. Andrade elected president, 708  
 Physicians, Royal College of : Croonian Lecture for 1942 (Dr. Donald Hunter), 412  
 Physics, Institute of : Prof. A. D. Ross elected president of the Australian Branch, 459  
 Formation of a Scottish Branch, 492  
 Election of officers, 708  
 Sir Frank Smith elected president, 708  
 Physics, Institute of (X-Ray Analysis Group) : Conference on X-Ray Analysis in Industry, 51, 533  
 Physics, Institute of, and the Institution of Chemical Engineers : Joint conference on Instruments for the Automatic Controlling and Recording of Chemical and other Processes, 617  
 Photographic Society, Royal : Symposium on Microdensitometry and Microsensitometry, 241  
 Pickard, Sir Robert : Retirement from the directorship of the British Cotton Industry Research Association, 49 ; work of, 49  
 Pickford, Dr. R. W. : Relation between Dissonance and Context, 85  
 Psychology of International Peace, review, 123  
 Total Colour Blindness of Hysterical Origin, 256  
 Women with Colour-Blind Relatives, 409  
 The Ishihara Test for Colour Blindness, 656  
 Pickford, Dr. R. W. (Misiak, Henry, and) : Physique and Perseveration, 622  
 Pilkington, R. W. (Waddington, Dr. C. H., and) : Eye Genes in *Drosophila melanogaster*, 28  
 Piper, C. S. : Manganese Deficiency in Oats, 197  
 Pirenne, Dr. M. H., and Crombie, Dr. A. C. : White Plumage of Sea-Birds, 526  
 Plank, Dr. J. E. van der : Production of Seed Potatoes in a Hot, Dry Climate, 589  
 Plaskett, Prof. H. H. : Solar Phenomena and some Allied Geophysical Effects, 452  
 Platt, Dr. B. S. : Appointed director of the Medical Research Council Unit for Research in Human Nutrition, 249  
 Pocock, R. I. : Pectoral Gland in Apes and Monkeys, 381  
 Pogge, R. C., and others : Promin Treatment of Leprosy, 465  
 Polanyi, Prof. M. : Elected a fellow of the Royal Society, 371  
 Polaroid Corporation : 'Polaroid Vectographs', 458  
 Political and Economic Planning : Broadsheet No. 215, PEP Work, 1940-43, 76  
 Broadsheet No. 216, Refugees in Great Britain, 281  
 Broadsheet No. 217, Demobilization and Employment, 507  
 Pollard, Dr. A. W. : *Death* of, 370 ; *obituary* by Dr. Arundell Esdaile, 487  
 Pollister, Prof. A. W., and Mirsky, Dr. A. E. : Distribution of Nucleic Acids, 711  
 Polunin, Dr. N. : Greenland Plants, 58  
 Pontecorvo, Dr. G. : Meiosis in the Striped Hamster, 319 ; *erratum*, 373  
 Structure of Heterochromatin, 365  
 Population, Royal Commission on, 310, 387  
 Lord Simon appointed chairman, 310  
 Porter, Bernard H. : Dehydrated Graphite Sols, 161  
 Post-War Problems, Conservative Central Committee on : Report of the Sub-Committee on Industry on Work, the Future of British Industry, 355  
 Poulton, Sir Edward : *Obituary* by Prof. G. D. Hale Carpenter, 15  
 Pow-Meng, Yap : The Place of Science in China, 247  
 Powell, A. K. : Growth-Inhibiting Action of Some Pure Substances, 345  
 Powell, Dr. F. C. : Reform of School Mathematical Syllabuses, 535, 536  
 Powell, H. M. : X-ray Analysis in Industry, 533  
 Prain, Sir David : *Death* of, 370 ; *obituary* by Prof. E. J. Salisbury, 426  
 Prasad, B. : Degree of D.Sc. of the University of London conferred on, 282  
 Pratt, Dr. D. D. : Chemistry of Large Molecules, review, 270  
 Prejean, B. M., and others : Promin Treatment of Leprosy, 465  
 Prescott, Prof. J. C. : *Obituary* of Prof. W. M. Thornton, 645  
 Preston, G. W., and Taylor, H. G. : Copper Conductors for Overhead Lines, 616  
 Preston, J. S. : Fatigue in Selenium Rectifier Photocells, 680  
 Preston, Dr. R. D. : Plant Tissue Culture, review, 328  
 Price, Charles C., and others : High Polymers, review, 665  
 Price, S. A., and Graves, H. C. H. : Microbiological Assay of Riboflavin, 461  
 Priestley, Dr. Raymond : Education for Engineers, 429  
 Appointed an additional member of the Commission on Higher Education in the Colonies, 79  
 Pringle, R. W. : A New Type of Microphotometer, 81  
 Pringle, W. J. S. (Barton-Wright, Dr. E. C., Booth, R. G., and) : Analysis of Barley from King Tutankhamen's Tomb, 288  
 Pritchard, Capt. J. L. : Control of Civil Aviation, review, 417  
 Probyn, E. H. : Appointed assistant conservator of forests, Sierra Leone, 51  
 Progressive League : Series of lectures on Psychology and Problems of Society, 649  
 Pryce-Jones, John : Some Problems Associated with Nectar, Honey and Pollen, 578  
 Public Analysts and other Analytical Chemists, Society of : Election of officers, 340  
 Pugsley, H. E., and Farquharson, R. F. : Isinglass as a Substitute for Human Blood Plasma, 248  
 Puschmann, Theodor (1844-1899), 585  
 Pycock, E. R., and Smith, G. F. (Dawson, H. M.) : Acids and Bases, 466  
 Pyman, Dr. F. L. : *Death* of, 48 ; *obituary* by Dr. Harold King, 189
- QUASTEL, Dr. J. H. (Lees, H., and) : Soil Sterilization, 738  
 Quekett Microscopical Club : Meetings now held at the Royal Society, 678  
 Quigley, Hugh : The Highlands of Scotland, Proposals for Development, 552
- RACE, Dr. R. R. : An 'Incomplete' Antibody in Human Serum, 771  
 Race, Dr. R. R. and others : Recognition of a Further Common Rh Genotype in Man, 52  
 Race, Dr. R. R., and Taylor, Dr. G. L. : The Rare Gene *Rhy* in Mother and Son, 560  
 Race, Dr. R. R., Taylor, Dr. G. L., and Fisher, Prof. R. A. : Mutation and the Rhesus Reaction, 106  
 Radford, Dr. M. : *Obituary* by Dr. C. Hill, 217  
 Radio Research Institute, British : Formation recommended by the British Institution of Radio Engineers, 338  
 Radiology, British Institute of : Twenty-third Silvanus Thompson Memorial Lecture (Prof. Sidney Russ), 585  
 Radley, J. A. : Starch and its Derivatives, second edition revised, review, 391  
 Rae, Prof. Robert : Improvement of Livestock, 117  
 To succeed Prof. James A. Scott Watson as British Agricultural Attaché at Washington and Agricultural Adviser at Ottawa, 400 ; work of, 400  
 Rae, S. L., and Wilkinson, A. W. : Tannic Acid and Burns, 583  
 Rae, Prof. William Norman (Reilly, Prof. Joseph, and) : Physico-Chemical Methods, fourth edition, Vol. 1, review by Prof. H. W. Melville, 696  
 Rahman, K. A., and Kalra, A. N. : Tent Caterpillar in India, 113  
 Rai, R. N. (Gogate, Prof. D. Y., and) : Surface Flow of Liquid Helium II and Bose-Einstein Degeneracy, 342  
 Ramsbottom, Dr. J. : Fungi for Food, 105  
*Obituary* of L. V. Lester-Garland, 613  
 Fungi and Modern Affairs, 636  
*Obituary* of H. N. Dixon, 705  
 Randall, Dr. J. T. : X-ray Analysis in Industry, 535  
 Randall, Prof. M., and Young, Prof. L. Esther : Elementary Physical Chemistry, review, 730  
 Ranganathan, V. (Narayanamurti, Dr. D., and) : Studies on Adhesives, Part 4, Further Note on Prolamin Adhesives, 173  
 Ranganathan, V., and Roy, D. C. (Narayanamurti, Dr. D.) : Preliminary Note on the Use of Sunn Hemp Seed Proteins as Plywood Adhesives, 173  
 Rao, P. Seshagiri (Giri, Dr. K. V., and) : Urease Activity and Ascorbic Acid, 253  
 Raw Materials Board, Combined : Second Annual Report, 740  
 Rawcliffe, G. H. : Degree of D.Sc. of the University of Aberdeen conferred on, 431  
 Rawlins, F. Ian G. : A Philosophy of Freedom, review, 150  
 Rayleigh, Lord : Metallic Searchlight Mirrors, 112  
 Raymond, W. F. (Lovelock, J. E., Lidwell, O. M., and) : Aerial Disinfection, 20  
 Vaporization of Lactic Acid as an Aerial Bactericide, 743  
 Raymond, J. E. G. (Auber, Dr. Ludwig, and) : Water Contents of Last-stage Larvæ, Pupæ and Adults of the Meal Moth, 314  
 Raymond, J. E. G. (Gross, Dr. F., and), and Marshall, Dr. S. M., and Orr, Dr. A. P. : A Fish-Farming Experiment in a Sea Loch, 483  
 Raymond, T. : Some Trends of American Thought, review, 207  
 Educational Reconstruction in India, 467  
 Examinations Examined, review, 728  
 Raynor, G. V. : The Equilibrium Diagram of the System Aluminium-Zinc, 220  
 Reavell, J. Arthur : Endowment of a lecture on a chemical engineering subject, 51  
 Redman, R. O. : Polarization in Fraunhofer Lines at the Sun's Limb, 718  
 Reed, H. B. : Some Contributions of Psychology toward the War Effort, 583  
 Rees, H. A. (Hunter, Dr. L., and) : Tautomerism of Cyanamide, 284  
 Rees, Principal J. F. : Appointed a member of the selection committee of the Miners' Welfare National Scholarship Scheme, 79  
 Rehner, Jr., John, and others : High Polymers, review, 665  
 Reichenbach, Hans : From Copernicus to Einstein, translated by Ralph B. Winn, review by Sir Harold Spencer Jones, 67  
 Reichmann, H. P. : Prof. Moore and Philosophy, review, 39  
 Reid, Earl D. : Blennioid Fishes, 465  
 Reid, John R. : Analytic Statements in Semiosis, 191  
 Reid, N. R. : Appointed a senior veterinary officer, Tanganyika, 741

- Reilly, Prof. Joseph, and Rae, Prof. William Norman : Physico-Chemical Methods, fourth edition, Vol. 1, review by Prof. H. W. Melville, 696
- Reiner, Dr. Markus : Ten Lectures on Theoretical Rheology, review by Dr. L. R. G. Treloar, 543
- Remington, John Stewart : Manure Note Book, review, 180
- Rendel, Dr. J. M. : Application of Genetics to Plant and Animal Breeding, 782
- Reyner, J. H. : Testing Radio Sets, fourth and revised edition, review, 237
- Ricardo, Dr. Harry R. : Elected president of the Institution of Mechanical Engineers, 249
- Richards, Dr. A. R. : A System of Notation for Petroleum Hydrocarbons, 715
- Richards, I. A. : Basic English and its Uses, review by Dr. Maxwell Garnett, 205
- Richards, Dr. T. Ll. : X-ray Analysis in Industry, 535
- Richardson, A. S. : Appointed director of agriculture, Uganda, 741
- Richardson, Sir Owen : *Obituary of Prof. Pieter Zeeman*, 158
- Richer, G. C. : X-ray Analysis in Industry, 535
- Rickett, C. B. : *Death of*, 581 ; *obituary by* N. B. Kinneer, 677
- Riddle, O., and Hollander, N. F. : Scraggly and Ataxic Pigeons, 58
- Rideal, Prof. Eric K. : Elected president of the Society of Chemical Industry, 193  
*Obituary of Dr. J. K. Roberts*, 551
- Rikli, Prof. Dr. M. : *Das Pflanzenkleid der Mittelmeerländer*, Lieferung 3-4, review by Miss G. M. Roseveare, 445
- Riley, Dr. D. P. : X-ray Analysis in Industry, 534  
Lattice Constant of Diamond and the C-C Single Bond, 587
- Riley, Prof. H. L. : X-ray Analysis in Industry, 534
- Ripper, Dr. W. E. : Biological Control as a Supplement to Chemical Control of Insect Pests, 448
- Ritchie, Prof. James : *Edinburgh Medical Men and the Great Adventure*, 280  
Regional Education, review, 328  
Awarded the Keith Prize of the Royal Society of Edinburgh for the period 1941-43, 431
- Ritchie, W. A. : Awarded a Cressy Morrison Prize of the New York Academy of Sciences, 193
- Riverdale, Lord : Research and Industry, 337
- Road Research Board : Committee on the Use of Machinery in Road Construction, 193 ; *erratum*, 249
- Roaf, Prof. H. E. : Colour Sensation in Man, review, 235
- Roberts, Group-Captain G. Silyn : Achilles and the Tortoise, 464
- Roberts, Dr. J. A. Fraser : Technique of Blood-Grouping, review, 95  
Intelligence and Season of Conception, 401
- Roberts, Dr. J. K. : *Obituary of Prof. Eric K. Rideal*, 551
- Roberts, Dr. R. W. : *Obituary of Prof. L. R. Willberforce*, 517
- Robinson, W. A. : Forest Products, 689
- Robinson, F. A. : The Nature of the Vitamin B<sub>2</sub> Complex, 478
- Robinson, F. A. (Barton-Wright, Dr. E. C., Emery, W. B., and) : New Components of the Vitamin B Complex, 771
- Robinson, Dr. P. L., and Stalnthorpe, K. R. : Two New Carbonyls—Copper and Tellurium, 24 ; *erratum*, 593
- Rochester, G. D. (Jánosy, Dr. L., and) : Radiation Producing Penetrating Showers, 259
- Rockefeller Foundation of New York : Grant to the Royal Society for assistance in the publication of scientific journals, 282  
Grant of 15,000 rupees to the National Institute of Sciences of India, 617
- Rogers, Dr. H. J. : Importance of Pyrimidine Derivatives in the Growth of Group C (Lancefield) Streptococci upon a Simplified Medium, 251
- Rogers-Low, B. W. (Crowfoot, Dr. D., and) : X-Ray Crystallography of Gliotoxin, 651
- Rolleston, Dr. J. D. : *Obituary of Prof. W. G. MacCallum*, 581  
Rhinology and Folk-Lore, 648
- Rooksby, H. P. : X-ray Analysis in Industry, 534
- Roseveare, Miss G. M. : Plant Geography of the Mediterranean Region, review, 445
- Ross, Prof. A. D. : Elected president of the Australian Branch of the Institute of Physics, 459
- Ross, Alan S. C. : Origin of Indo-European Languages, 257
- Roseland, Prof. Svein : The Pulsation Theory of Cepheid Variables, 261
- Rosett, Miss H. G. Q. : Gut of *Nebalacea*, 318
- Rowlands, Dr. S. M. (Lougher, Miss E. T., and) : Radioactivity in Osmium, 374
- Roxby, Prof. P. M. : Appointed principal representative in China of the British Council, 373
- Roy, D. C. (Narayanamurti, Dr. D., Ranganathan, V., and) : Preliminary Note on the Use of Sunn Hemp Seed Proteins as Plywood Adhesives, 173
- Royal Academy, 1944 : Science and Art at the (Dr. A. T. Hopwood), 643
- Royal Aeronautical Society : Election of Group Captain F. Whittle as a fellow, 135
- Royal Asiatic Society : Gold Medal awarded to Sir John Marshall, 522
- Royal Asiatic Society of Bengal : P. N. Bose Memorial Medal for 1943 awarded to Sir Lewis Fermor, 617
- Royal Astronomical Society : George Darwin Lecture (Prof. Svein Roseland), 261  
Dr. Otto Struve awarded the Gold Medal, 340  
Election of officers, 492
- Royal Cancer Hospital (Free) and the Chester Beatty Research Institute : Selected Papers from the, Vol. 2, review by Dr. P. R. Peacock, 329
- Royal Caroline Institute, Stockholm : To build a Medical Nobel Institute, 615
- Royal College of Physicians : Croonian Lecture for 1942 (Dr. Donald Hunter), 412
- Royal College of Surgeons : Scientific Report for the Year 1942-43, 321
- Royal Commission on Population, 310, 387  
Lord Simon appointed chairman, 310
- Royal Entomological Society and the British Ecological Society : Discussion on the Inter-relations of Plants and Insects, 424
- Royal Institute of Chemistry : Sixty-sixth annual general meeting, 372  
Frankland Medal and Prize awarded to Dudley Rhoden Scarffe, 372
- Royal Institute of International Affairs : Occupied Europe—German Exploitation and its Post-War Consequences, 686
- Royal Observatory, Greenwich, 175
- Royal Photographic Society : Symposium on Microdensitometry and Microsensitometry, 241
- Royal Society of London : Meeting in India, 48, 63  
Presentation of a copy of the first edition of Newton's "Principia" to the Academy of Sciences of the U.S.S.R., 75  
Grant from the Rockefeller Foundation of New York for assistance in the publication of scientific journals, 282  
Election of fellows, 370, 770  
Grant to the Allied Control Commission for the maintenance of the Zoological Station at Naples, 373  
Creation of a Horace Darwin Fund, 739  
Bakerian Lecture by Prof. W. N. Haworth, 785
- Royal Society of Arts : Albert Gold Medal awarded to Sir Henry Tizard, 679
- Royal Society of Edinburgh : Election of new fellows, 312  
Awards for the period 1941-43, 431
- Royal Statistical Society : Memorandum on Official Statistics, 88
- Rubbo, Sydney D. (Albert, Dr. Adreine, Falk, John E., and) : Antibacterial Action of Arsenic, 712
- Rudra, M. N. : Manganese Hunger in Animals, 111  
Role of Manganese in the Biological Synthesis of Ascorbic Acid, 743
- Runes, Dr. Dagobert D. (edited by) : Twentieth Century Philosophy, review by T. Raymont, 207
- Runes, Dr. Dagobert D. (edited by) Doherty, Dr. William Brown, and) : Rehabilitation of the War Injured, review, 329
- Runnström, Prof. John, Lindvall, Sven, and Tiselius, Prof. Arne : Gamones from the Sperm of Sea Urchin and Salmon, 285 ; *erratum*, 649
- Runnström, Prof. John, Monné, Dr. Ludwik, and Wicklund, Miss Elsa : Mechanism of Formation of the Fertilization Membrane in the Sea Urchin Egg, 313
- Ruppert, Karl, and Denison, Jr., John H. : Archaeological Reconnaissance in Campeche, Quintano Roo, and Peten, 61
- Rushton, E. : Plastics and Electrical Technology, 642
- Russ, Prof. Sidney : The Man Silvanus Thompson (Twenty-third Silvanus Thompson Memorial Lecture of the British Institute of Radiology), 585
- Russell, Prof. H. N. : Probable Physical Characteristics of the Quasi-Planets recently found in the Systems 61 Cygni and 70 Ophiuchi, 59  
The Planetary Companion of 61 Cygni, 491
- Rutland, J. P. : Supplement to the Merton Catalogue of Chromosomes of British Plants, 249
- Rylands, J. R., and Jenkinson, J. R. : Bonded Deposits on Economizer Heating Surfaces, 29
- S**
- SABNIS, Dr. T. S. : Recent Advances in Botany in relation to Improved Crop Production, 499
- Sager, E. E., Schooley, M. R., and Acree, S. F. : Potassium *para*-Phenol-sulphonate as a Buffer, 532
- Sahní, Prof. B. : Age of the Saline Series in the Salt Range of the Punjab, 462
- Salisbury, Prof. E. J. : Antibiotics and Competition, 170  
Inter-relations of Plants and Insects, 424  
*Obituary of Sir David Prain*, 426
- Sand, A. : Elected a fellow of the Royal Society, 371
- Sandell, Prof. E. B. (Kolthoff, Prof. I. M., and) : Textbook of Quantitative Inorganic Analysis, revised edition, review, 730
- Sandford, Dr. K. S. : *Obituary of Major H. J. L. Beadnell*, 279
- Sandford, Dr. Mary (Dolby, Doris E., Happold, Dr. Frank C., and) : Growth-Factors Required for the Nutrition of *Lactobacillus casei* s, 619
- Sandford, Dr. Mary (Happold, Dr. Frank C., Chattaway, Dr. F. W., and) : Microbiological Assay of Riboflavin, 225
- Santos, Dr. Eduardo : Public Health in Colombia, 340
- Sargent, John : Educational Reconstruction in India, 447
- Saville, D. B. O. : Ice-Crystal Haloes, 25
- Sawyer, R. E. : Nature of the Acid in Soft Water in relation to the Growth of Brown Trout, 55
- Sawyer, W. W. : The Theory of Functions, 536
- Scarffe, Dudley Rhoden : Awarded the Sir Edward Frankland Medal and Prize of the Royal Institute of Chemistry, 372
- Schiller, P. : Electricity Supply System Load System, 430
- Schilpp, Paul Arthur (edited by) : The Philosophy of G. E. Moore, review by H. P. Reichmann, 39
- Schlackjer, E. M. (Brown, Barnum, and) : A Canadian Dinosaur, 465
- Schlauch, Prof. Margaret : The Gift of Tongues, review by Capt. T. H. Hawkins, 68
- Schofield, Dr. R. K. : Disk-Harrowing versus Ploughing, review, 391
- Schönberg, Prof. Alexander, and Mustafa, Ahmed : Reactions of Ethylenes with 1,2-Diketones in Sunlight, 195
- Schooley, M. R., and Acree, S. F. (Sager, E. E.,) : Potassium *para*-Phenol-sulphonate as a Buffer, 532
- Schröderheim, Johan (Gustafsson, Dr. Ake, and) : Ascorbic Acid and Hip Fertility in Rosa Species, 196
- Schrödinger, Prof. Erwin : Non-linear Optics and Electrodynamics, 532  
The Affine Connexion in Physical Field Theories, 572  
Rate of *n*-fold Accidental Coincidences, 592  
The Statistical Law in Nature, 704
- Schuchardt, Prof. Karl : *Death of*, 457
- Schuster, Dr. E. H. J. : A New Form of Microfilm Reader, 155
- Schütz, Dr. F. : Induction of Sleep by Simultaneous Administration of Posterior Pituitary Extracts and Water, 432
- Science Masters' Association : Election of Dr. William Cullen as president, 193
- Scientific Societies (Chinese) : Annual Meeting of, 228
- Scientific Workers, Association of : Election of Prof. P. M. S. Blackett as president, 193  
Agreement with the Engineering and Allied Employers National Federation, 649  
Post-War Plans for Science, 740
- Scientific Workers, Association of (Watford Branch) : Conference on Freedom from Want of Food, 750
- Slater, Dr. W. L. : *Obituary of E. C. Stuart Baker*, 580
- Scott, Dr. D. A., and Fisher, Dr. A. M. : Carbonic Anhydrase, 711
- Scott, G. Shaw, and the Institute of Metals, 614
- Scott, T. R. (Barron, Dr. H., Dean, J. N., and) : Thermoplastic Electric Cables, 248
- Scruton, H. A. : Wordsworth and Science, 560
- Sears, P. B. : The Role of Botany in the War Effort, 583
- Seddon, Prof. H. J. : Treatment of Peripheral Nerve Injuries, 78

- Sederholm, Per (Benedicks, Prof. Carl, and): Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and Foam consisting solely of Liquids, 80
- Influence of an Adsorbed (Inner) Layer on the Cohesion of a Solid, 109
- Seldon, T. H., and Young, H. H.: Red Blood Cells as Wound Dressings, 340
- Selman, Ireson W.: Mosaic Disease and Fruiting of the Tomato, 531
- Sen, Prof. N. R., and Burman, U.: Hydrogen Content of the Sun and of Stars of Small Masses, 166
- Seshagiri Rao, P. (Giri, Dr. K. V., and): Urease Activity and Ascorbic Acid, 253
- Seward, the late Sir Albert Charles: Geology for Everyman, review by Prof. L. J. Willis, 445
- Sewertzoff, S. A.: Population Dynamics and Adaptive Evolution of Animals, review by Dr. B. P. Uvarov, 66
- Sharman, Dr. B. C.: Branched Heads in Wheat and Wheat Hybrids, 497
- Sharman, C. F.: Filiform Underfilm Corrosion of Lacquered Steel Surfaces, 621
- Shaw, Sir Napier: Ninetieth Birthday of, 246
- Sheffield, Dr. F. M. L.: The Nucleolus, 687
- Sherwood, N. P.: Bacteriology, Medicine and the War, 583
- Shipbuilding Research Association, British: Establishment of a, 105
- Dr. S. Livingston Smith appointed director of research, 741
- Shorland, F. B.: Leaf Lipids of Forage Grasses and Clovers, 168
- Shorland, F. B. (de la Mare, P. B. D., and): Fat of Sow's Milk, 380
- Shovelton, S. T.: *Obituary* of Prof. A. E. Jolliffe, 488
- Sidgwick, Alfred: *Death* of, 48
- Sidgwick, Prof. N. V.: X-ray Analysis in Industry, 533
- Siegbahn, Kai:  $\beta$ -Radiation from Active Phosphorus and Sodium, 221
- Siegbahn, Prof. Manne: An Interferometric Procedure for the Examination of Crystal Surfaces, 435
- Siegel, G. L., and Acree, S. F. (Bates, R. G., and): Thermodynamic Second Dissociation Constant  $K_2$  of *para*-Phenol Sulphonic Acid, 532
- Sigma Xi, Society of the: Extending its activities to non-academic research institutions, 373
- Installation of the St. Louis Chapter at St. Louis University, 679
- Simha, Robert, and others: High Polymers, review, 665
- Simon, Lord: Appointed chairman of the Royal Commission on Population, 310
- Simon, Sir Ernest: The Development of the Universities, 471
- Simpson, N. G. (Boyse, C. O., and): Conductor Sagging on Overhead Lines, 192
- Singh, B. (Hawker, Lillian E., and): Disease of Seedling Lilies, 466
- Singh, Major Indrajit: Viscosity and Contraction of Unstriated Muscle, 591
- Sircar, Dr. S. M.: Vernalization of Rice by Short Days, 378
- Slater, Prof. J. C.: Microwave Transmission, review, 124
- Slee, Comdr. J. A.: *Death* of, 581
- Smale, J. A.: Comparative Merits of Different Types of Directive Aerials for Radio Communications, 228
- Small, Dr. T.: The Soil as a Source of Infection of Dry Rot of Potato, 436
- Smare, Dr.: X-ray Analysis in Industry, 533
- Smart, Dr. John: A Handbook for the Identification of Insects of Medical Importance, review by Dr. A. D. Imms, 96
- Invasion of the New World by *Anopheles gambiae*, 765
- Smedley-Maclean, Dr. Ida: The Metabolism of Fat, review by Dr. A. Klein-zeller, 510
- Smith, D. M.: Microdensitometry and Microsensitometry, 243
- Smith, Eng.-Capt. Edgar C.: Scientific Centenaries in 1944, 14
- Smith, Sir Frank: Elected president of the Institute of Physics, 708
- Smith, G. F.: Acids and Bases, 466
- Smith, G. F. (Dawson, H. M., Pycock, E. R., and): Acids and Bases, 466
- Smith, H. J.: The Western Electric Fastax High-Speed Motion-Picture Camera, 77
- Smith, John: The Veterinarian and the Colonies, 60
- Smith, J. Hunter: Agricultural Education, 116
- Smith, Major J. M.: The Veterinarian and the Colonies, 60
- Smith, Dr. S. Livingston: Appointed director of research of the British Shipbuilding Research Association, 741
- Smith, Dr. S. W.: *Obituary* of Prof. Alfred Stansfield, 336
- Metallurgy in Everyday Terms, review, 634
- Smith-Rose, Dr. R. L.: Measurements in Radio Experimental Work, 50
- Smithsonian Institution: War Background Studies No. 10, Poisonous Reptiles of the World, 135
- Annual Report for 1941, 403
- Annual Report for 1942, 615
- Annual Report for 1943, 769
- Smyth, J. D. (Hill, G. R., and): Localization of Vitamin C in *Belascaris marginata*, 21
- Snellman, Olle (Blix, Prof. Gunnar, and): Molecular Shape and Size of Hyaluronic Acid and Chondroitinsulphuric Acid, 587
- Soal, S. G., and Goldney, K. M.: Experiments in Precognitive Telepathy, review by Dr. E. J. Dingwall, 298
- Social Credit Co-ordinating Committee: Memorandum on Employment After the War, 615
- Social Hygiene Council, British: Summer School in Social Biology, 373, 708
- Sorsby, Prof. Arnold: Blindness, 383
- Southwell, Prof. R. V.: Interchange of staff and postgraduate students with the Imperial College and the Massachusetts Institute of Technology, 104
- Soviet Scientists Antifascist Committee: Message to the Faraday Society on the action of the Germans in the U.S.S.R., 49
- Spangenberg, K., and Field, L. M.: Electrostatic Electron Lenses, 441
- Special Libraries and Information Bureaux, Association of: Lectures on Special Librarianship, 163
- To publish a British Union Catalogue of Periodicals, 490
- Spillert, E. E.: X-ray Analysis in Industry, 535
- Spooner, C. E. (Belcher, R., and): A New Technique for the Ultimate Microanalysis of Organic Compounds, 24
- Sreenivasan, Dr. A.: Nitrogenous Manuring of Black Cotton Soil, 55
- Srinivasan, Dr. M.: Vitamin C in Plants—Indian Gooseberry (*Phyllanthus emblica*), 684
- Stainthorpe, K. R. (Robinson, Dr. P. L., and): Two New Carbonyls—Copper and Tellurium, 24; *erratum*, 593
- Standards Institution, British: Office Organization and Practice, 769
- Stanier, Sir William: Elected a fellow of the Royal Society, 371
- Stansfield, Prof. Alfred: *Death* of, 218; *obituary* by Dr. S. W. Smith, 336
- Stansfield, V.: Photography as a Tool in Agricultural Research, 719
- Staples, E. G.: Appointed director of agriculture, British Honduras, 741
- Stark, Dr. W.: The Ideal Foundations of Economic Thought, review by M. H. Dobb, 236
- Statistical Society, Royal: Memorandum on Official Statistics, 88
- Stebbing, Prof. E. P.: The Forest as a Factory, 243
- Stebbins, J., and Whitford, A. E.: Multi-Colour Photometry of Stars, 29
- Stedman, Dr. Edgar and Mrs. Ellen: 'Chromosomin' and Nucleic Acids, 500
- Stein, Sir Aurel: *Obituary* by Basil Gray, 216
- Bequests of, 431
- Stelfox, S. H., and others: Geostatics, 716
- Stenhouse, A. S.: Appointed senior agricultural officer, Tanganyika, 741
- Stenlid, G. (Lundegårdh, H., and): Physico-Chemical Properties of the Surface of Growing Plant Cells, 618
- Stephens, E. H. (Clare, N. T., and): Congenital Porphyria in Pigs, 252
- Stephens, S. G.: Phenogenetic Evidence for the Amphidiploid Origin of New World Cottons, 53
- Meiosis of a Triple Species Hybrid in *Gossypium*, 82
- Stetson, Harlan T. (Field, Richard M., and): Map Reading and Avigation, review, 180
- Stevenson, D.: Appointed conservator of forests, Gold Coast, 617
- Stewart, W. A.: Breeding of Beef Cattle, 172
- Stockley, G. M.: Awarded a Murchison Fund of the Geological Society, 134
- Stokes, Dr. A. R.: Microdensitometry and Microsensitometry, 242
- X-ray Analysis in Industry, 534
- Stoll, Dr. N. R.: Changed Viewpoints in Helminthic Disease—World War II vs. World War II, 626
- Stott, R. W.: Electronic Theory and Chemical Reactions, review by Dr. E. D. Hughes, 510
- Stott, W. B. (Duke, H. Lyndhurst, and): Duration of Immunization against Diphtheria, 318
- Stoves, Dr. J. L.: Morphology of Mammalian Hair, 285
- Stratton, F.: Rh Antibodies in Human Sera, 773
- Street, Arthur, and Alexander, William: Metals in the Service of Man, review by Dr. S. W. Smith, 634
- Streeton, G. W. P.: Appointed deputy government chemist, Jamaica, 282
- Strömgren and Lundmark: Re-discovery of Comet Schaumasse, 522
- Strong, Prof. Wm. Duncan: Cross Sections of New World Prehistory, a Brief Report on the Work of the Institute of Andean Research, 1941-42, 708
- Stroud, E.: Elected president of the Illuminating Engineering Society, 647
- Struve, Dr. Otto: An Astronomical Paradox, 340
- Awarded the Gold Medal of the Royal Astronomical Society, 340
- Stubblefield, Dr. C. J.: Elected a fellow of the Royal Society, 371
- Studd, Sir Kynaston: *Death* of, 159
- Stueckelberg, Prof. E. C. G.: An Unambiguous Method of Avoiding Divergence Difficulties in Quantum Theory, 143
- Stunkard, Prof. H. W.: Parasitic Diseases, 625
- Sugar Research Foundation: Dr. Robert C. Hockett appointed scientific director, 18
- Aims of (Joseph F. Abbott), 18
- Surgeons, Royal College of: Scientific Report for the Year 1942-43, 321
- Sutherland, G. A.: Simple Sensitive Flames, 376
- Sutherland, Maurice D.: Vitamin C in Plants—'Nasturtium' (*Tropaeolum majus*), 683
- Svedberg, Prof. The: Elected to an honorary life membership of the New York Academy of Sciences, 163
- Elected a foreign member of the Royal Society, 770
- Svedberg, Prof. The (Jullander, Ingvar, and): The Osmotic Balance, 523
- Svedelius, Prof. N. E.: Elected a foreign member of the Royal Society, 770
- Svirbelly, W. J. (Davis, R., Bridge, H. S., and): Electric Polarizations in Extremely Dilute Solutions, 258
- Swan, Kenneth: Appointed chairman of a committee to report on the Patents and Designs Acts, 553
- Swedish Cellulose Co.: Manufacture of 'Cellugel' and 'Cellulfix', 616
- T**AFALL, Prof. B. F. Osorio: Nature of the Viruses, 402
- Tattam, C. M.: Appointed deputy director of geological surveys, Nigeria, 617
- Taylor, Prof. Eva G. R.: Retirement from the University of London chair of geography tenable at Birkbeck College, 679, 706; work of, 706
- Taylor, E. L.: A Search for Endemic Areas of Trichinosis in Great Britain, 745
- Taylor, Dr. G. L., and others: Recognition of a Further Common Rh Genotype in Man, 52
- Taylor, Dr. G. L. (Race, Dr. R. R., and): The Rare Gene *Rhy* in Mother and Son, 560
- Taylor, Dr. G. L., Race, Dr. R. R., and Fisher, Prof. R. A.: Mutation and the Rhesus Reaction, 106
- Taylor, H. G. (Preston, G. W., and): Copper Conductors for Overhead Lines, 616
- Taylor, Prof. N. B., and Moorhouse, Miss M. S.: Isinglass as a Substitute for Human Blood Plasma, 247
- Taylor, Dr. W. H.: X-ray Analysis in Industry, 534
- Thermomoretz, I. (Adler, Prof. S., and): Development of Gametocytes from Extraerythrocytic Forms in *Plasmodium gallinaceum*, 83
- Teachers, National Union of: Sex Teaching in Schools, 325
- Teachers in Technical Institutions, Association of: Presidential Address by H. Wragg at the thirty-fifth annual conference, 677
- Teale, Sir Edmund, and Oates, F.: Mineral Resources of Tanganyika, 740
- Technological Museum of New South Wales: Annual Report for the Year 1942, 281
- Teich, N.: Influence of Newton's Work on Scientific Thought, 42
- Teletype Corporation: A Teletypewriter Test Set, 161
- Temperton, H.: Feeding Waste Appliances to Poultry, 30
- Thatcher, F. S.: Wheat-Puccinia Relationships, 28
- Therapeutic Corporation of Great Britain: Election of officers for the year 1944, 79
- Thimann, Prof. Kenneth V. (edited by Harris, Prof. Robert S., and)  $\rightarrow$  Vitamins and Hormones, Vol. 1, review by Dr. A. S. Parkes, 151
- Thomas, Geoffrey (Box, Kathleen, and): War-time Social Survey, 647
- Thompson, Sir D'Arcy: Skokholm, review, 270
- Thompson, Dr. E. F.: Appointed fishery officer, Jamaica, 249
- Thompson, Prof. F. C.: Research and the Iron and Steel Industry, 291
- The Extrusion of Metals, review, 696

- Thompson, Sir Herbert : *Death of*, 677
- Thompson, Dr. H. W. : The Scope and Limitations of Infra-Red Measurements in Chemistry (Tilden Lecture for 1944 of the Chemical Society), 79, 209
- Thompson, Prof. J. McLean : Towards a Physiological Interpretation of Modern Flowering, 163
- Thompson, Dr. R. H. S., and others : Sulphur-containing Amino-Acids and Jaundice, 773
- Thomson, Prof. Thomas : Appointed to the chair of forestry at the University College of North Wales, 103
- Thorne, A. L. C. : Appointed veterinary officer, Gold Coast, 51
- Thornton, Prof. W. M. : *Death of*, 581 ; *obituary* by Prof. J. C. Prescott, 645
- Thorpe, the late Prof. Jocelyn Field, and Whiteley, Dr. M. A. : Dictionary of Applied Chemistry, fourth edition revised and enlarged, Vol. 5, Abridged Index to Vols. 1-5 and Vol. 6, with an Index to Vols. 1-6, *review* by M. B. Donald, 297
- Thorpe, Dr. W. H. : Inter-relations of Plants and Insects, 426
- Ties, Dr. O. W. : Elected a fellow of the Royal Society, 371
- Tillotson, Ernest : The Argentine Earthquake, 132
- Timoshenko, Prof. S. : Elected a foreign member of the Royal Society, 770
- Tiselius, Prof. Arne : Elected to an honorary life membership of the New York Academy of Sciences, 163
- Tiselius, Prof. Arne (Runnström, Prof. John, Lindvall, Sven, and) : Gamones from the Sperm of Sea Urchin and Salmon, 285 ; *erratum*, 649
- Tizard, Sir Henry : Awarded the Albert Gold Medal of the Royal Society of Arts, 679
- Tobolsky, A. V., and others : High Polymers, *review*, 665
- Tocher, Dr. J. F. (edited and arranged by) : The Book of Buchan (Jubilee Volume), *review* by Prof. James Ritchie, 328
- Todd, Prof. A. R. : Appointed professor of organic chemistry in the University of Cambridge, 282, 310 ; *work of*, 310
- Todd, Prof. A. R., and others : Reactions of Amidines with derivatives of Malonic Acid, 59
- Todd, Prof. A. R. (Baddiley, J., Lythgoe, B., and) : Synthesis of Adenine, 59
- Todd, Prof. George W. : *Obituary* of J. W. Bullerwell, 580
- Tolansky, Dr. S. : Topography of a Quartz Crystal Face, 195
- New Interference Phenomena with Newton's Rings, 314
- An Interferometric Procedure for the Examination of Crystal Surfaces, 435
- Tomkeieff, S. I. : The Geology of Rhum, 351
- Tomkeieff, S. I., and others : Geostatics, 716
- Topham, A., and others : Reactions of Amidines with derivatives of Malonic Acid, 59
- Topley, Prof. W. W. C. : *Death of*, 135 ; *obituary* by Dr. A. N. Drury, 215
- Tordoff, H. : Appointed assistant conservator of forests, Trinidad, 249
- Tottingham, Prof. W. E. : *Death of*, 738
- Town and Country Planning Association : Moving to new premises, 522
- Townsend, Dr. C. H. : *Death of*, 457
- Townsend, Sir John : Electricity and Radio Transmission, *review*, 237
- Toy, Dr. F. C. : Appointed director of research to the British Cotton Industry Research Association, 19, 49
- Treloar, Dr. L. R. G. : Rheology, Practical and Theoretical, *review*, 543
- Trinity College, Dublin : Centenary of Zoological Teaching in (Prof. J. Bronté Gatenby), 723
- Trowell, Dr. O. A. : Effects of Carbon Dioxide on the Heart and Circulation, 686
- Troy, Zeliaette : Streamlining Production and Distribution of Current Periodical Articles, 134
- Trueman, Prof. A. E. : The Training of a Regional Planner, *review*, 7
- Trueman, E. R. : Occurrence of Strontium in Molluscan Shells, 142
- Tuckey, C. O. : Elected president of the Mathematical Association for 1944, 536
- Tufnell, Olga : The Wellcome-Marston Excavations at Lachish, Palestine, 545
- Turnbull, J. : Orchard Spraying for Commercial Growers, 51
- Turner, H. J. (Methley, B. W., and) : Solubility of Basic Open Hearth Slags, 778
- Twort, C. C. (White, L. J., Baker, A. H., and) : Aerial Disinfection, 141
- Twyman, E. S. : Manganese Deficiency in Oats, 198
- Tyagi, Boutsros and Bardhan, Drs. : Control of Typhus, 537
- Tyler, Dr. Cyril (Black, D. J. G., and) : Fluctuations in the Porosity of Egg-Shells, 682
- U**LRICH, Dr. E. O. : *Death of*, 280
- Underwood, Dr. A. J. V. : Resignation as joint honorary secretary of the Institution of Chemical Engineers, 741
- Unger, L. J. (Moorhead, J. J., and) : Red Blood Cells as Wound Dressings, 340
- United Nations Relief and Rehabilitation Administration : Resolutions and Reports adopted by the Council at its First Session, held at Atlantic City, 415
- United States Government : Gift of typhus vaccine to Governments in the Middle East, 554
- United States National Academy of Sciences : Charles L. Mayer Prize awarded to Dr. Alexander Lipschütz, 614
- United States National Patent Planning Commission (Sir William Jarratt), 12
- University of Aberdeen : Conferment of degrees, 431
- University of Ankara : Opening of a new Faculty of Science, 247
- University of Birmingham : Annual report to the court of Governors, 429
- To award Anglo-American studentships in petroleum technology, 770
- University of Cambridge : Prof. A. R. Todd appointed professor of organic chemistry, 282, 310
- Unit for Research in Applied Psychology established by the Medical Research Council, 617
- University of Cincinnati : Dr. Paul Herget appointed professor and head of the Department of Astronomy, 163
- University of Edinburgh : Prof. F. A. E. Crew appointed to the Bruce and John Usher chair of public health, 371
- Sir Thomas H. Holland to retire from the posts of principal and vice-chancellor, 489
- Sir John Fraser elected principal, 489
- Exhibition of Early Medical Books, 647
- Prof. John MacMurray appointed professor of moral philosophy, 679
- University of Glasgow : Prof. C. M. Yonge appointed regius professor of zoology, 617, 646
- University of Leeds : Foyle Prize Essay (N. Teich), 42
- Two scholarships given to the Mining Department, 649
- University of London : Conferment of degrees, 282
- Title of professor emeritus of bacteriology conferred on Sir John Ledingham, 282
- Prof. T. A. Bennet-Clark appointed to the chair of botany in Kings' College, 552
- Dr. C. T. Ingold appointed to the chair of botany in Birkbeck College, 552
- Retirement of Prof. Eva G. R. Taylor from the chair of geography tenable at Birkbeck College, 679, 706
- Appointment of Dr. S. W. Wooldridge to the chair of geography tenable at Birkbeck College, 679, 706
- University of Manchester : Prof. H. J. Fleure to retire from the chair of geography, 340, 489 ; *work of*, 489
- Walter Fitzgerald elected to the chair of geography, 340, 489
- University of Sheffield : Gift from Lord Kemsley to provide an annual travelling fellowship, 679
- J. G. Graves Trustees to endow research fellowships in medical sciences, 739
- University College, London : Prof. W. H. Pearsall appointed Quain professor of botany, 340, 400
- University College of North Wales : Prof. Thomas Thomson appointed to the chair of forestry, 103
- University Grants Committee : Government to maintain the provision for universities and colleges, 220
- University Teachers, Association of : Report on University Developments, 471
- U.S.S.R., Academy of Sciences of the : To establish a Western Siberian branch at Novosibirsk, 51
- U.S.S.R., Astronomical Institute of Sciences of the : Ephemerides for the Determination of Time Corrections by Equal Altitudes (Zinger's Method) for 1941, 29
- Uvarov, Dr. B. P. : Fluctuation in Animal Populations, *review*, 66
- Inter-relations of Plants and Insects, 426
- V**AN DER BIL, Dr. H. J. : Elected a fellow of the Royal Society, 371
- Van Dersal, William R. : The American Land, *review* by Lieut. D. Carpenter, 697
- Van Helmont, J. B. (1579-1644), (Dr. W. Pagel), 675
- Van Horn, E. : Bell Laboratories Photographic Department, 192
- Varley, Dr. G. C. : Inter-relations of Plants and Insects, 426
- Vaughan, A. W. : Appointed veterinary officer, Jamaica, 249
- Veinoglu, B. C. (Blair, Dr. G. W. Scott, and) : Comparison of the Behaviour of Rubber-like Materials under Constant Stress and Constant Strain Conditions, 165
- Veintemillas, Dr. Felix : Chronic Parasitoses in Bolivia, 51
- Venn, J. A. J. : Influence of Green Food on the Prevention of Piglet Anæmia, 591
- Vesaluis, Andreas : A Bio-Bibliography of (Harvey Cushing), *review* by Prof. F. J. Cole, 694
- Veterinary Medical Association of Great Britain and Ireland, National : Discussion on the Improvement of Livestock, 117
- Vigroux, Ernest (Barbier, Daniel, Chalonge, Daniel, and) : Lunar Eclipses and the Earth's Atmosphere, 708
- Vincent, J. M. : Variation in the Nitrogen-fixing Property of *Rhizobium trifolii*, 496
- Viner, Prof. J. : Trade Relations between Free-Market and Controlled Economies, 412
- Voelcker, O. J. : Seconded to Gold Coast for duty in connexion with cocoa diseases, 617
- Vysotsky, —, and Williams, — : Partition of Energy among the Stars of the Galaxy, 114
- W**ADDINGTON, Dr. C. H. : Leg Genes in *Drosophila melanogaster* 28, The Human Side of Anthropology, 106
- Waddington, Dr. C. H., and Pilkington, R. W. : Eye Genes in *Drosophila melanogaster*, 28
- Wallace, Sir Cuthbert : *Death of*, 738
- Wallersteiner, Dr. W. K. S. (Enoch, Dr. H. E., and) : A Standardized Antibacterial Pyrogen-free Metabolite Preparation containing Living *Penicillium notatum*, 380
- Wallis, P. J. : Mathematics as a Cultural Subject, 26
- Walters, H. B. : *Death of*, 551
- Walton, Dr. A. : Application of Genetics to Plant and Animal Breeding, 781
- Ward, Sir Thomas : *Death of*, 159
- Wardlaw, Prof. C. W. : Unification of Botanical Science, 125
- Experimental Observations on the Relation between Leaf Development and Stelar Morphology in Species of Dryopteris, 377
- Bud Regeneration at Cut Parenchymatous Surfaces in Onocleoid Ferns, 588
- Warrington, Mrs. Mary (Castell, H. C., Dilnot, S., and) : Reaction between Solids, 653
- Waters, J. W. (Dilby, Dr. D. E., and) : Use of Casein Hydrolysate in Experiments on the Nutrition of *Lactobacillus casei*, 139
- Watson, Prof. D. M. S. : History of Elephants, *review*, 5
- Watson, Dr. H. B. : Organic Chemistry (Post-Graduate Lectures), *review*, 237
- Watson, Prof. James A. Scott : To be succeeded by Prof. Robert Rae as British Agricultural Attaché at Washington and Agricultural Adviser at Ottawa, 400
- Watson, J. H. L. : Electron Microscopy, 466
- Watters, J. R. G. : Appointed assistant conservator of forests, Nigeria, 51
- Wearmouth, Dr. W. G. (Couzens, E. G., and) : Plastics in the Radio Industry, *review*, 418
- Weddell, A. G. McDonnell : Degree of D.Sc. of the University of London conferred on, 282
- Wedel, Waldo R. : Recent Archaeological Investigations in Platte and Clay Counties, Missouri, 322
- Wedmore, E. B. : Factors in the Production of Honey, 578
- Weil-Malherbe, Dr. H. : Metabolism of Acetoacetic Acid, 435



- Weill, Miss Adrienne R. (Farquhar, Mme. Margaret C. M., and) : Detection of the  $K\alpha$  Satellites on X-Ray Powder Photographs, 56
- Weiss, Dr. Joseph : Radiochemistry of Aqueous Solutions, 748
- Weller, B. F. : Radio-Technology, review, 180
- Wells, H. G. : The Universal Rights of Man, 220  
The Illusion of Personality, 395
- Welsh Reconstruction Advisory Council : Interim Report, 726
- West, Dr. Ranyard : Conscience and Society, review by Dr. R. W. Pickford, 123
- Wheat, W. N. (Hampton, Dr. W. M., Bastick, R. E., and) : New Types of Optical Glass, 283
- Wheeler, J. E. (Mance, Brig.-Gen. Sir Osborne, assisted by) : International Air Transport, review by Capt. J. L. Pritchard, 417
- Wheeler, Dr. J. F. G. : Nemertean Worm of the Genus *Gorgonorhynchus*, 113
- Wheeler, Dr. R. E. Mortimer : Appointed director-general of archaeology in India, 105
- Whistler, Hugh : Addition to the *obituary* notice of (P. Deraniyagala), 522
- White, L. J., Baker, A. H., and Twort, C. C. : Aerial Disinfection, 141
- White, Dr. Philip R. : A Handbook of Plant Tissue Culture, review by Dr. R. D. Preston, 328
- Whitehead, J. H. C. : Elected a fellow of the Royal Society, 371
- Whitehouse, A. W. : Veterinary Education in Great Britain, 227
- Whiteley, Dr. M. A. (Thorpe, the late Prof. Jocelyn Field, and) : Dictionary of Applied Chemistry, fourth edition revised and enlarged, Vol. 5, Abridged Index to Vols. 1-5, and Vol. 6, with an Index to Vols. 1-6, review by M. B. Donald, 297
- Whitford, A. E. (Stebbins, J., and) : Multi-Colour Photometry of Stars, 29
- Whittaker, Prof. E. T. : An Aristotelian on Logic and Geometry, review, 268
- Whittaker, Major S. R. F. (Brockbank, Lieut.-Colonel W., and) : Control of Typhus, 537
- Whittemore, T. : Elected a member of the Athenæum, 340
- Whittle, Group-Captain Frank : Jet-Propelled Fighter Aircraft, 74  
Elected a fellow of the Royal Aeronautical Society, 135  
Awarded the James Alfred Ewing Medal for 1943, 554
- Wicklund, Miss Elsa (Runnström, Prof. John, Monné, Dr. Ludwik, and) : Mechanism of Formation of the Fertilization Membrane in the Sea Urchin Egg, 313
- Widdowson, Dr. E. M. (McCance, Dr. R. A., and) : Activity of the Phytase in Different Cereals and its Resistance to Dry Heat, 650
- Wigglesworth, Dr. V. B. : Wordsworth and Science, 367, 560  
Action of Inert Dusts on Insects, 493
- Wilberforce, Prof. L. R. : Death of, 428 ; *obituary* by Dr. R. W. Roberts, 517
- Wilcox, T. W. (Cox, H. E., and) : High-Voltage Circuit-Breaker Technique, 627
- Wild, R. W. (Harle, J. A., and) : High-Voltage Circuit-Breaker Technique, 627
- Wilkins, W. H., and Harris, G. C. M. : Estimation of the Anti-Bacterial Activity of Fungi that are Difficult to Grow on Liquid Media, 590
- Wilkinson, A. W. (Rae, S. L., and) : Tannic Acid and Burns, 583
- Wilks, S. S. : Mathematical Statistics, review, 8
- Williams, Major D. I., and others : Sulphur-containing Amino-Acids and Jaundice, 773
- Williams, Sir Evan : Presidential Address to the British Coal Utilization Research Association, 104
- Williams, Dr. E. E. : Appointed secretary of the Agricultural Committee of the Caribbean Research Council, 403
- Williams, Mrs. Gertrude : *Obituary* of Dr. H. A. Mess, 278
- Williams, George Bransby : The Purification of Water Supplies, review by Dr. H. T. Calvert, 544
- Williams, H. Paul : Determination of Polar Diagrams of Radio Antennæ, 50
- Williams, T. I. (Glistler, G. A., and) : Production of Gliotoxin by *Aspergillus fumigatus* mut. *helvola* Yuill, 651
- Williams, — (Vyssotsky, —, and) : Partition of Energy among the Stars of the Galaxy, 114
- Willink, H. U. : Water Resources of Great Britain, 219
- Willis, John H. : Weatherwise, review by E. G. Bilham, 756
- Willmer, E. N. : Colour of Small Objects, 774
- Wills, J. A. : Appointed conservator of forests, Gold Coast, 617
- Wills, Prof. L. J. : Introduction to Geology, review, 445
- Wilmott, A. J. : Inter-relations of Plants and Insects, 425
- Wilson, Frank : The Entomological Control of St. John's Wort (*Hypericum perforatum* L.), 785
- Wilson, Lieut. G. B. : Death of, 645
- Winbolt, S. E. : Death of, 280 ; *obituary* by I. D. Margary, 518
- Winslow, Charles-Edward Amory : The Conquest of Epidemic Disease, review by Major J. Marshall, 475
- Witherby, H. F. : *Obituary* by N. B. Kinnear, 17
- Wolfson, H. : Base Electrolytes for use in Polarographic Determinations, 375
- Wood, Dr. Alexander : The Physics of Music, review by Sir James Jeans, 357
- Wood, Eric C. : Mathematics of Biological Assay, 84, 681  
Value of Human Milk, 584
- Wood, E. J. Ferguson, and Jones, Valerie May : Seaweed Products in Australia, 263
- Wood Jones, Prof. F. : The Antiquity of Man in Australia, 211  
The Black Redstart, 747
- Woodger, Dr. J. H. : Elementary Morphology and Physiology for Medical Students, third edition, review, 697
- Woods, R. C., and MacDonald, A. S. : Staff Selection by Scientific Methods, 741
- Wooldridge, Dr. S. W. : Appointed to the chair of geography in the University of London tenable at Birkbeck College, 679, 706 ; work of, 706
- Woolf, Dr. B. : Budgetary and Dietary Surveys of Families and Individuals, 308
- Worden, Alastair N. : British Society of Animal Production, 172
- Worley, Dr. R. E. (Gaydon, Dr. A. G., and) : Singlet Terms in the Spectrum of Molecular Nitrogen, 747
- Wormell, Dr. R. L., and Kaye, Maurice A. G. : Reaction between Proteins and Formaldehyde, 525
- Worthington, Dr. E. B., and Keen, Dr. B. A. : Return to England from the Middle East Supply Centre, 708
- Wragg, H. : Presidential Address at the thirty-fifth annual conference of the Association of Teachers in Technical Institutions, 677
- Wright, Dr. W. D. : Dichroism, 9  
The Art of the Optician, review, 544
- Wrought Light Alloys Development Association : Offer of a research scholarship, 220
- Wyburn, Dr. G. M. (Bacsich, Dr. P., and) : Behavioural Changes in Spayed Female Guinea Pigs after Stilboestrol Administration, 346
- Wylam, Dr. Birkett : *Obituary* by Dr. John Hamilton, 280
- Wylie, Thos. Smith, and Conway, Frank G., (Moore, Dr. Quintin) : Science Class Lecture Ciné-Films, 784

## YAP POW-MENG : The Place of Science in China, 247

- Yates, Dr. F. : Application of Genetics to Plant and Animal Breeding, 783
- Yates, Dr. P. Lamartine : Budgetary and Dietary Surveys of Families and Individuals, 307  
Freedom from Want of Food, 750
- Yerkes, Prof. Robert M. : Chimpanzees, a Laboratory Colony, review by Prof. S. Zuckerman, 65
- Yonge, Prof. C. M. : Appointed regius professor of zoology in the University of Glasgow, 617, 646 ; work of, 646
- Young, H. H. (Seldon, T. H., and) : Red Blood Cells as Wound Dressings, 340
- Young, Prof. James : *Obituary*, 337
- Young, J. Z. : Contraction, Turgor and the Cytoskeleton of Nerve Fibres, 333
- Young, Prof. L. Esther (Randall, Prof. M., and) : Elementary Physical Chemistry, review, 730
- Yowell, Everett L. : One Hundred Years at the Cincinnati Observatory, 311
- Yule, G. Udny : The Statistical Study of Literary Vocabulary, review by M. G. Kendall, 570

## ZAMENHOF, Dr. S. : Effect of Factors Influencing Mutability, 169

- Zanstra, H. : Scattering of Light by Small Particles, 466
- Zeeman, Prof. Pieter : *Obituary* by Sir Owen Richards, 158
- Zeuner, Dr. F. E. : Studies in the Systematics of *Troides* Hübner (Lepidoptera Papilionidae) and its Allies ; Distribution and Phylogeny in relation to the Geological History of the Australasian Archipelago, 32  
*Homo sapiens* in Australia contemporary with *Homo neanderthalensis* in Europe, 622
- Zhebrak, Dr. Anton : Synthesis of New Species of Wheats, 549
- Zoological Station, Naples : Grant from the Royal Society to the Allied Control Commission for the maintenance of, 373
- Zoology and Botany of Academia Sinica, National Institute of : Research Activities during 1943, 410
- Zuckerman, Prof. S. : Life and Mentality of the Chimpanzee, review, 65
- Zwetkoff, Prof. : Ephemerides for the Determination of Time Corrections by Equal Altitudes (Zinger's Method) for 1941, 29

# SUBJECT INDEX

- ABORIGINES**—'so-called'—and their Future (Prof. G. S. Ghurye), *review*, 668
- Absorption in the Atmosphere and Decay of Cosmic Rays (Prof. A. Duperier), 529
- Absorption (Heat of): Boundary Lubrication and (J. J. Frewing), 718
- Academic Training to Industry: Relation of (Dr. H. Erb), 561
- Accidents: Road, and Road Structure (W. W. Davies), 330
- Accion humana como una causa posible de liberer movimientos sismicos (Walter Knoche), 219
- Acetate Utilization for Maintenance of Motility of Bull Spermatozoa (Henry A. Lardy and Dr. Paul H. Phillips), 168
- Acetoacetic Acid: Metabolism of (Dr. H. Weil-Malherbe), 435
- Achilles and the Tortoise (Prof. F. G. Donnan), 142, 464; (Group-Captain G. Silyn Roberts), 464
- Acid in Soft Water in relation to the Growth of Brown Trout: Nature of the (R. E. Sawyer), 55; (F. T. K. Pentelow), 464
- Acids and Bases (G. F. Smith), 466; (H. M. Dawson, E. R. Pycock and G. F. Smith), 466
- Activation of Pyrethrins in Fly-Sprays (W. A. L. David and P. Bracey), 594
- Activity of Purified Carbonic Anhydrase (Prof. D. Keilin and Dr. T. Mann), 107
- Adenine: Synthesis of (J. Baddiley, B. Lythgoe and A. R. Todd), 59
- Adenosine-triphosphate Initiating Contraction and Changing Bi-refringence in Isolated Cross Striated Muscle Fibres (Dr. Fritz Buchthal, Adam Deutsch and G. G. Knappes), 774
- Adhesives: Studies on, Part 4, Further Note on Prolamin Adhesives (Dr. D. Narayanamurti and V. Ranganathan), 173; Part 6, Preliminary Note on the Use of Sunn Hemp Seed Proteins as Plywood Adhesives (Dr. D. Narayanamurti, V. Ranganathan and D. C. Roy), 173
- Adhesives and Linings: Plywood, 173
- Adolescence: The Psychology of Frustration and Fulfilment in (Course of lectures arranged by the National Council for Mental Hygiene), 79
- Adrenal Cortex in Mice: Trypan Blue and Growth of the (Prof. M. K. McPhail), 460
- Adrenal Glands of Guinea Pigs: Effect of Vitamin C on the Adrenaline Content of the (Sachchidananda Banerjee), 526
- Adsorbed (Inner) Layer on the Cohesion of a Solid: Influence of an (Prof. Carl Benedicks and Per Sederholm), 109; (L. C. Bannister), 315
- Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and Foam consisting solely of Liquids (Prof. Carl Benedicks and Per Sederholm), 80
- Adventure (Great): Edinburgh Medical Men and the, 280
- Advisory Service for Agriculture and Horticulture: A National (H. W. Miles), 611
- Aedes aegypti* through Animal Membranes: Feeding, A Method of Collecting Sporozoites of *Plasmodium gallinaceum* by (Dr. Ann Bishop and Barbara M. Gilchrist), 713
- Aerial Bactericide: Vaporization of Lactic Acid as an (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 743
- Aerial Disinfection (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 20; (L. J. White, A. H. Baker and C. C. Twort), 141
- Aerials for Radio Communications (Directive): Comparative Merits of Different Types of (J. A. Smale), 228
- Aerodynamics of the Aeroplane (W. L. Cowley), *review*, 272
- Aeroplane: Aerodynamics of the (W. L. Cowley), *review*, 272
- Aeroplane Compass, 679
- Affine Connexion in Physical Field Theories (Prof. E. Schrödinger), 572
- Africa: Education and the Community in (Prof. Daryll Forde), 606
- Africa (North): The Hygiene of the Eighth Army in (Lieut.-Colonel H. S. Gear), 688
- Africa (West): Development Advisor for, 18
- African Society: Mass Education in (Report of the Colonial Office Advisory Committee on Education in the Colonies), 607
- African Tree Senecios and other Genera: The Megaphytic Habit in the (A. D. Cotton), 679
- Ages: The Three, an Essay on Archaeological Method (Dr. Glyn E. Daniel), *review* by Prof. V. Gordon Childe, 206
- Agricultural Attaché at Washington and Agricultural Adviser at Ottawa: New British, 400
- Agricultural Education (Agricultural Education Association conference on), 116
- Agricultural Education in Great Britain, 190
- Agricultural Machinery Instruction: Organization of (D. I. McLaren), 117
- Agricultural Research: Photography as a Tool in (Association for Scientific Photography discussion on), 719
- Agricultural Scholarships (Ministry of Agriculture and Fisheries), 431
- Agriculture and Horticulture: A National Advisory Service for (H. W. Miles), 611
- Air (Atmospheric): Carbon Dioxide Content of (Dr. E. Glükauf), 620
- Air Transport: International (Brig.-Gen. Sir Osborne Mance and J. E. Wheeler), *review* by Capt. J. L. Pritchard, 417
- Airborne Infection (Prof. Dwight O'Hara), *review*, 271
- Airborne Surgical Unit (C. J. Longland and L. Kessel), 429
- Aircraft: Jet-Propelled Fighter, 74
- Aircraft Industry: Scientific Personnel in the, 49
- Alaska: Earthquake on November 3, 163
- (South-eastern): Earthquake on February 3, 708
- Albacore (*Germa alalunga*) of the Oregon Coast and other parts of the North Pacific: Contribution to the Biology of the (Vernon E. Brock), 717
- Albert Gold Medal of the Royal Society of Arts awarded to Sir Henry Tizard, 679
- Aldehyde: Vitamin A (Dr. R. F. Hunter and E. G. E. Hawkins), 194
- Algae (Terrestrial): A New Genus of (Prof. F. E. Fritsch), 620
- Alloy Systems (Binary): Equilibrium Diagrams of (Institute of Metals), 220
- Alternating Current Arcs: Diffusion Phenomena in (J. J. O'Doherty), 558
- Aluminium-Zinc (System): The Equilibrium Diagram of the (G. V. Raynor), 220
- America: The Early History of Science and Learning in (Proceedings of the American Philosophical Society, Vol. 87, No. 1), *review* by T. Raymont, 207
- (North): The Biotic Provinces of (Lee R. Dice), *review*, 697
- America a Century Ago, *review* by Squadron-Leader J. N. L. Baker, 395
- American Archaeology: Recent (M. C. Burkitt), 322
- American Land: The (William R. Van Dersal), *review* by Lieut. D. Carpenter, 697
- American Thought: Some Trends of, *review* by T. Raymont, 207
- American Timbers (South): Some, 564
- Americans: Mirror for (Prof. Ralph H. Brown), *review* by Squadron-Leader J. N. L. Baker, 695
- Amidines with Derivatives of Malonic Acid: Reactions of (G. W. Kenner, B. Lythgoe, A. R. Todd and A. Topham), 59
- Amino-Acids (Individual): Biochemical Importance of (Dr. T. F. Dixon), 289
- Amino-Acids: Sulphur-containing, and Jaundice (Prof. R. A. Peters, Dr. R. H. S. Thompson, Lieut.-Colonel A. J. King, Major D. I. Williams and Major C. S. Nicol), 773
- p-Aminobenzoic Acid on the Toxicity of p-Amino-Benzene-Sulphonamide to Higher Plants and Fungi: Effect of (Dr. P. W. Brian), 83
- p-Aminobenzoic Acid and its Effect on the Sulphanilamide Inhibition of the Growth of Oat Roots (R. Forbes Jones), 379
- Aminoquinolines: Basicities of the—Comparison with the Aminoacridines and Aminoipyridines (Dr. Adrien Albert and Reginald Goldacre), 467
- Amphidiploid Origin of New World Cottons: Phenogenetic Evidence for the (S. G. Stephens), 53
- Analysis: Chemical, *review*, 730
- (Elementary): Lessons in (Dr. G. S. Mahajani), third edition, *review*, 272
- (Quantitative Inorganic): Textbook of (Prof. I. M. Kolthoff and Prof. E. B. Sandell), revised edition, *review*, 730
- Systematic Qualitative Organic (H. Middleton), second edition, *review*, 730
- Analytic Statements in Semiosis (John R. Reid), 191
- Anatomy of the Bronchi (Dr. A. F. Foster-Carter), 784
- Ancient Astrology (Joshua C. Gregory), 512
- Angiosperms and Fungi: Genetical Control of Incompatibility in (Dr. K. Mather), 392
- Anglo-American Collaboration in the Caribbean Region, 320
- Anglo-American Studentships in Petroleum Technology (University of Birmingham), 770
- Anglo-Saxon Petroleum Company Scholarship tenable in the Mining Department of the University of Leeds, 649
- Animal Breeding (Plant and): Application of Genetics to (Genetical Society symposium on), 780
- Animal Membranes: A Method for Collecting Sporozoites of *Plasmodium gallinaceum* by Feeding Infected *Aedes aegypti* through (Dr. Ann Bishop and Barbara M. Gilchrist), 713
- Animal Populations: Fluctuations in, *review* by Dr. B. P. Uvarov, 65
- Animals: Manganese Hunger in (M. N. Rudra), 111
- Population Dynamics and Adaptive Evolution of (S. A. Sewertzoff), *review* by Dr. B. P. Uvarov, 66
- (Farm): Control of Ovulation in (John Hammond, jun.), 702
- Anopheles gambiae*: Invasion of the New World by (Dr. John Smart), 765
- Antarctic: Whalebone Whales in the, *review* by F. C. Fraser, 569
- Anthracene: Fluorescence Spectra of Naphthacene Molecules in Solid Solution of, with the Variation of Wave-lengths (S. C. Ganguly), 652; (E. J. Bowen), 653
- Anthropology: Future of, 26
- The Human Side of (Dr. C. H. Waddington), 106
- Truth in (Verrier Elwin), 624; (Prof. J. H. Hutton), 624
- Antibacterial Action of Arsenic (Dr. Adrien Albert, John E. Falk and Sydney D. Rubbo), 712
- Antibacterial Activity of Fungi that are Difficult to Grow on Liquid Media: Estimation of the (W. H. Wilkins and G. C. M. Harris), 590
- Antibacterial Pyrogen-free Metabolite Preparation containing Living *Penicillium notatum*: A Standardized (Dr. H. E. Enoch and Dr. W. K. S. Wallersteiner), 380
- Antibacterial Substances in Green Plants (E. M. Osborn), 598
- Antibiotic from *Aspergillus parasiticus* (Dr. A. H. Cook and Dr. M. S. Lacey), 460
- Antibiotics from *Aspergillus fumigatus*—Identity of Helvolic Acid and Fumigaclin, 531
- Antibiotics and Competition (Prof. E. J. Salisbury), 170
- Antibodies: Rh, in Human Sera (F. Stratton), 773
- Antibody in Human Serum: An 'Incomplete' (Dr. R. R. Race), 771
- Antifibromatogenic Activity of Steroid Hormones: Chemical Structure and (Dr. Alexander Lipschütz), 260
- Antigen of Salmonella: A New (José Julio Monteverde and Ramon Hector Leiguarda), 589
- Antiquity of Man in Australia (Prof. F. Wood Jones), 211
- Ants: Classification of (B. D. Wragge Morley), 321
- 'Apeiron': Statistical Mechanics of Fields and the (Prof. Max Born and H. W. Peng), 164
- Apes and Monkeys: Pectoral Gland in (R. I. Pocock), 381
- Apples: Feeding Waste, to Poultry (H. Temperton), 30
- Apprentice Scholarship Scheme at Birmingham, 429
- Aquatic Fungi: New Species of (Dr. C. F. Ingold), 717
- Aquatic Hyphomycetes: New Species of (Dr. C. F. Ingold), 717
- Aquatic Megaloptera and Neuroptera: Keys to the British Species of (D. E. Kimmins), 741
- Aqueous Solutions: Radiochemistry of (Dr. Joseph Weiss), 748
- Arable Farming (Poor Land): The Economics of (Dr. S. M. Makings), *review*, 757
- Archean Gneisses of the Rodil District of South Harris (C. F. Davidson), 466
- Archaeological Find in Kenya, 582

- Archaeological Investigations in Platte and Clay Counties, Missouri (Waldo R. Wedel), 322
- Archaeological Method : Historical Analysis of, review by Prof. V. Gordon Childe, 206
- Archaeological Reconnaissance in Campeche, Quintana Roo, and Peten (Karl Ruppert and John H. Denison, Jr.), 61
- Archaeological Reconnaissance in Guatemala (G. H. S. Bushnell), 61
- Archaeology : Recent American (M. C. Burkitt), 322
- Area Heating (A. E. Margolis), 27 ; (Dr. L. E. C. Hughes), 27
- Argentina : Earthquake on January 15, 708 ; on January 16, 741
- Argentine Earthquake (Ernest Tillotson), 132
- Aristotelian on Logic and Geometry : An, review by Prof. E. T. Whittaker, 268
- Arithmometer : Pascal's, 247
- Armadillidium vulgare* (Latr.) : Reproduction of the Woodlouse (Dr. Walter E. Collinge), 776
- Army Service Veterinary Selection Committee, 19
- Arsenic : Antibacterial Action of (Dr. Adrien Albert, John E. Falk and Sydney D. Rubbo), 712
- Art at the Royal Academy, 1944 : Science and (Dr. A. T. Hopwood), 643
- Ascorbic Acid : Role of Manganese in the Biological Synthesis of (M. N. Rudra), 743
- Urease Activity and (Dr. K. V. Giri and P. Seshagiri Rao), 253
- Ascorbic Acid and Hip Fertility in Rosa Species (Dr. Ake Gustafsson and Johan Schröderheim), 196 ; (Prof. J. W. Heslop Harrison and G. A. D. Jackson), 404 ; (Dr. Ronald Melville), 404
- Askanya Nova Nature Reserve, 75
- Aspergillus fumigatus* : Antibiotics from, 531
- Aspergillus fumigatus* mut. *helvola* Yuill : Production of Gliotoxin by (G. A. Glistler and T. I. Williams), 651
- Aspergillus giganteus* Wehm. : Claviformin from (Prof. H. W. Florey, M. A. Jennings and Flora J. Philpot), 139
- Aspergillus parasiticus* : An Antibiotic from (Dr. A. H. Cook and Dr. M. S. Lacey), 460
- Assam : Earthquake on October 23, 163
- Assay of Riboflavin : Microbiological (Dr. Frank C. Happold, Dr. F. W. Chattaway and Dr. Mary Sandford), 225 ; (S. A. Price and H. C. H. Graves), 461
- Assay (Biological) : Mathematics of (Eric C. Wood), 84, 681 ; (D. J. Finney), 284 ; (N. T. Gridgeman), 461
- Astrology : Ancient (Joshua C. Gregory), 512
- Astronomical Newsletter* : Monthly, 770
- Astronomical Paradox : An (Dr. Otto Struve), 340
- Astronomy : Ancient, 459
- Atmosphere : Absorption in the, and Decay of Cosmic Rays (Prof. A. Duperier), 529
- Atmospheric Air : Carbon Dioxide Content of (Dr. E. Glückauf), 620
- Atoll (Coral) : Vertical Section of a (Admiral Sir John Edgell), 680
- Australasia : Regional Organization in, 582
- Australasian Archipelago : Studies in the Systematics of *Troides* Hübner (Lepidoptera Papilionidae) and its Allies ; Distribution and Phylogeny in relation to the Geological History of the (Dr. F. E. Zeuner), 32
- Australia : The Antiquity of Man in (Prof. F. Wood Jones), 211
- Control of St. John's Wort in (Dr. A. D. Imms), 785
- Homo sapiens* in, contemporary with *Homo neanderthalensis* in Europe (Dr. F. E. Zeuner), 622
- Seaweed Products in (E. J. Ferguson Wood and Valerie May Jones), 263
- Australian Forestry in War-time, 490
- Austria : Patent Law and Procedure in (Dr. Paul Abel), 716
- Aviation (Civil) : Control of, review by Capt. J. L. Pritchard, 417
- Aviation : Map Reading and (Richard M. Field and Harlan T. Stetson), review, 180
- Awn Barbing in Wheat : Inheritance of (P. F. Knowles), 258
- BACTERIA** : Mutations in (G. Luria and M. Delbruck), 717
- Bacteria : Spore-forming, causing Soft Rot of Potato and Retting of Flax (L. A. Allen), 224
- Bacterial and other Diseases of Crops in England and Wales for the Years 1933-1942 : Report on Fungus, (Ministry of Agriculture and Fisheries Bulletin No. 126), review by Dr. John Grainger, 447
- Bactericide (Aerial) : Vaporization of Lactic Acid as an (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 743
- Bacteriological Diagnosis of Gas Gangrene due to *Clostridium oedematiens* (Dr. F. P. O. Nagler), 496
- Bacteriological Methods : Recent Advances in (Prof. J. Cruickshank), 76
- Bacteriology, Medicine and the War (N. P. Sherwood), 583
- Bacteriolysis : Physico-Chemical Nature of (W. A. Dorfman), 169
- Baker's Yeast : Effect of Carbon Dioxide and Carbon Dioxide Fixation in (Dr. Knut M. Brandt), 343
- Bakerian Lecture of the Royal Society (Prof. W. N. Haworth), 785
- Balance : The Osmotic (Ingvar Jullander and Prof. The Svedberg), 523
- Banana Selection : Effects of (K. G. Dodds), 258
- Banda Sea : Earthquake on November 6, 163
- Barley from King Tutankhamen's Tomb : Analysis of (Dr. E. C. Barton-Wright, R. G. Booth and W. J. S. Pringle), 288
- Bartram (William) of Philadelphia, Naturalist and Traveller (Francis Harper), 648
- Bases : Acids and (G. F. Smith), 466 ; (H. M. Dawson, E. R. Pycock and G. F. Smith), 466
- Basic for Science (C. K. Ogden), review by Dr. Maxwell Garnett, 205
- Basic English (Report of the Committee of Ministers on), 339
- Basic English and its Uses (I. A. Richards), review by Dr. Maxwell Garnett, 205
- Basic Open Hearth Slags : Solubility of (B. W. Methley and H. J. Turner), 778
- Basicities of the Aminoquinolines—Comparison with the Aminoacridines and Aminopyridines (Dr. Adrien Albert and Reginald Goldacre), 467
- Bee (Wild) : Chalk Brood Attacking a (Dr. Ronald Melville and H. A. Dade), 112
- Behaviour of Rubber-like Materials under Constant Stress and Constant Strain Conditions : Comparison of the (Dr. G. W. Scott Blair and B. C. Veinoglou), 165
- Behavioural Changes in Spayed Female Guinea Pigs after Stilboestrol Administration (Dr. P. Bacsich and Dr. G. M. Wyburn), 346
- Belascaris marginata* : Localization of Vitamin C in (G. R. Hill and J. D. Smyth), 21
- Bengal : Studies on Myxosporidia from the Common Food Fishes of (M. Chakravarty), 113
- Bessemer Gold Medal of the Iron and Steel Institute for 1944 awarded to Essington Lewis, 431
- Beverages : Vitamin Content of (Sir J. C. Drummond and Dr. T. Moran), 99
- Bibliography of Seismology (Ernest A. Hodgson), Vol. 13, No. 13, 491
- Biochemical Importance of Individual Amino-Acids (Dr. T. F. Dixon), 289
- Biochemistry of the Thyroid Gland : Newer Knowledge of the (Dr. C. R. Harington), 312
- Biological Assay : Mathematics of (Eric C. Wood), 84, 681 ; (D. J. Finney), 284 ; (N. T. Gridgeman), 461
- Biological Colours : Names of (H. A. Dade), 220
- Biological Control as a Supplement to Chemical Control of Insect Pests (Dr. W. E. Ripper), 448
- Biological Flora of the British Isles (British Ecological Society), 425
- Biological Results of the Last Cruise of the *Carnegie*, 89
- Biological Synthesis of Ascorbic Acid : Role of Manganese in the (M. N. Rudra), 743
- Biology : Classification in (K. H. Chapman), 768
- Biology of the Albacore (*Germo alalunga*) of the Oregon Coast and other parts of the North Pacific : Contribution to the (Vernon E. Brock), 717
- Biology of the Malarial Parasite in the Vertebrate Host (Dr. D. G. Davey), 110
- Biology and Larval Development of *Leander squilla* (L.) forma *typica* de Man (Dr. Hans Höglund), 751
- Biology (Social) : Summer School in (British Social Hygiene Council), 373, 708
- Biosynthesis of Hyocycamine : Putrescine in the (B. T. Cromwell), 717
- Biotic Provinces of North America (Lee R. Dice), review, 697
- Bird : The Black Redstart, a New British Breeding (R. S. R. Fitter), 659 ; (Prof. F. Wood Jones), 747
- Bird Migration : Wind and (Dr. Norman H. Joy), 135
- 'Bird-Wing' Butterflies : Palæontology without Fossils in the (Dr. A. Steven Corbet), 32
- Birds of Ceylon, 522
- Birds (Sea-) : White Plumage of (Dr. K. J. W. Craik), 288, 527 ; (Sir John Graham Kerr), 347 ; (Dr. M. H. Pirenne and Dr. A. C. Crombie), 526 ; (Edward A. Armstrong), 527 ; (D. S. Falconer), 777
- Bi-refringence in Isolated Cross Striated Muscle Fibres : Adenosine-triphosphate Initiating Contraction and Changing (Dr. Fritz Buchthal, Adam Deutsch and G. G. Knappeis), 774
- Birmingham : Apprentice Scholarship Scheme at, 429
- Birth-Rate : Prenatal Mortality and the (Dr. A. S. Parkes), 245
- Black Redstart, a New British Breeding Bird (R. S. R. Fitter), 659 ; (Prof. F. Wood Jones), 747
- Blennioid Fishes (Earl D. Reid), 465
- Blind Seed Disease of Rye-Grass (E. L. Calvert and A. E. Muskeet), 287
- Blindness (Prof. Arnold Sorsby), 383
- Blindness : Total Colour, of Hysterical Origin (Dr. R. W. Pickford), 256
- Blood : Function of Carbonic Anhydrase in (Prof. J. Fegler), 137
- Blood Cells as Wound Dressings : Red (J. J. Moorhead and L. J. Unger), 340 ; (T. H. Seldon and H. H. Young), 340
- Blood-Grouping : Technique of, review by Dr. J. A. Fraser Roberts, 95
- Blood Groups : The Determination of (Medical Research Council War Memorandum No. 9), review by Dr. J. A. Fraser Roberts, 95
- Human (Dr. J. F. Loutic), 97
- Blood Plasma (Human) : Isinglass as a Substitute for, 247
- Blood Transfusion : Ox Blood for (Dr. G. Lapage), 145
- Blue and Yellow : Visibility of (Prof. H. Hartridge), 775
- Boletaceae of North Carolina (Prof. William Chambers Coker and Alma Holland Beers), review by Prof. C. T. Ingold, 667
- Bolivia : Chronic Parasitoses in (Dr. Felix Veintemillas), 51
- Typhus Fever in, 162
- (South-west) : Earthquake on December 1, 554
- Bombay Island (Sir Lewis Fermor), 565
- Bombay Island : Geographical and Geological Features of (Dr. A. S. Kalapesi), 565
- Bone : The Pisiform (Prof. H. A. Harris), 715
- Bone Marrow : Transfusion into the (Hamilton Bailey), 258
- Books : Recent Scientific and Technical, Supp. ii, January 29 ; Supp. ii, February 26 ; Supp. ii, March 25 ; Supp. ii, April 29 ; Supp. ii, May 27 ; Supp. ii, June 24
- Boron Hydrides : Structure of (H. C. Longuet-Higgins and R. P. Bell), 59
- Boron Trifluoride : Dimethyl Ether Compound with (S. H. Bauer, G. R. Finlay and A. W. Laubengayer), 114
- Bose Memorial Medal for 1943 of the Royal Asiatic Society of Bengal awarded to Sir Lewis Fermor, 617
- Bose-Einstein Degeneracy : Surface Flow of Liquid Helium II and (Prof. D. V. Gogate and R. N. Rai), 342
- Botanical Investigations at Rothamsted : Development of (Dr. James Davidson), 198
- Botanical Science : Unification of (Prof. C. W. Wardlaw), 125
- Botany in relation to Improved Crop Production : Recent Advances in (Dr. T. S. Sabinis), 499
- Botany in War-time : The Role of (P. B. Sears), 583
- Botrytis* spp. on Onion Leaves (C. J. Hickman and D. Ashworth), 466
- Botrytis cinerea* (Grey Mould) of Flax (Dr. John Colhoun), 25
- Bottles (Milk) : Cleansing of (Dr. G. Lapage), 31
- Boundary Lubrication and Heat of Absorption (J. J. Frewing), 718
- Bower-birds : Display and Bower-building in (A. J. Marshall), 685
- Bracken Frond throughout its Growing Season : Composition of the (J. G. Hunter), 656
- Brain Rhythms (Prof. E. D. Adrian), 360
- Brazil : Chagas's Disease in (C. Chagas, jun.), 678
- Bread (Flour and) : National, Fourth Report on (Scientific Adviser's Division of the Ministry of Food), 154
- Breeding of Beef Cattle (W. A. Stewart), 172
- Breeding of Dairy Cattle (Dr. Joseph Edwards), 172
- Breeding of Dual-Purpose Cattle (W. S. Mansfield), 172
- Breeding (Plant and Animal) : Application of Genetics to (Genetical Society symposium on), 780

- Britain : Cancer Research in, during 1942-1943, 276  
Rail and Road Transport in, 490  
See also under Great Britain
- British Agricultural Attaché at Washington and Agricultural Adviser at Ottawa, 400
- British Birds : Editorship of, 458
- British Breeding Bird : The Black Redstart, a New (R. S. R. Fitter), 659 ; (Prof. F. Wood Jones), 747
- British Electric Power Station Practice, review by C. W. Marshall, 729
- British Elm Flora (Dr. R. Melville), 198 ; (Alexander L. Howard), 198
- British Industry : Work, the Future of (Report by the Sub-Committee on Industry of the Conservative Central Committee on Post-War Problems), 355
- British Isles : Biological Flora of the (British Ecological Society), 425
- British Medical Bulletin, 311 : Special issue (Vol. 2, No. 1) devoted to Penicillin, 312 ; for sale in the United Kingdom (British Council), 649
- British Medicine and the Göttingen Medical School, 678
- British Species of Aquatic Megaloptera and Neuroptera : Keys to the (D. E. Kimmins), 741
- British Timbers (E. H. B. Boulton and B. Alwyn Jay), review, 477
- British Trade Unions (Mrs. Mary Agnes Hamilton), 553
- British Union Catalogue of Periodicals to be published by the Association of Special Libraries and Information Bureaux, 490
- Bronchi : Anatomy of the (Dr. A. F. Foster-Carter), 784
- Bryozoa : Studies of (E. Marcus), 114
- Buchan : The Book of (Jubilee Volume) (edited and arranged by Dr. J. F. Tocher), review by Prof. James Ritchie, 328
- Bud Regeneration at Cut Parenchymatous Surfaces of Onocleoid Ferns (Prof. C. W. Wardlaw), 588
- Budgetary and Dietary Surveys of Families and Individuals (Nutrition Society conference on), 306, 585
- Building Research in the United States (Report of the British Building Mission), 349
- Bull Spermatozoa : Acetate Utilization for Maintenance of Motility of (Henry A. Lardy and Dr. Paul H. Phillips), 168
- Burma (India and), 1941-42 : Forest Research in, Part I, The Forest Research Institute, 201
- Burns : Tannic Acid and (S. L. Rae and A. W. Wilkinson), 583 ; (R. H. Franklin), 584
- Butterflies ('Bird-Wing') : Palæontology without Fossils in the (Dr. A. Steven Corbet), 32
- C**ABLES : Locating Buried, Electrically (R. M. C. Greenidge), 173
- Thermoplastic Electric (Dr. H. Barron, J. N. Dean and T. R. Scott), 248
- Calcium Clouds : Interstellar, 319
- Calculating Machine ? Is the Mind a, review by Winston H. F. Barnes, 605
- Calendar : The Edwards Perpetual (Lieut. Willard E. Edwards), 229
- The Reform of the (Colonel C. A. Gill), 229
- Camera : The Western Electric Fastax High-Speed Motion-Picture (H. J. Smith), 77
- Camouflage : War (Sir John Graham Kerr), 347
- Campeche, Quintana Roo, and Peten : Archaeological Reconnaissance in (Karl Ruppert and John H. Denison, Jr.), 61
- Canada : Differential Fertility in (Enid Charles), 402
- Canada and the United States : Geophysical Exploration in, 503
- Canadian Dinosaur (Barnum Brown and E. M. Schlackjer), 465
- Canadian Mortality in War Years, 282
- Canadian Seed Potato Eye Trade, 160
- Cancer : Symposium on, review by Dr. P. R. Peacock, 329
- Treatment of, 160
- Cancer Research in Britain during 1942-1943 (Dr. E. Boyland), 276
- Cannon Prize of the American Astronomical Society awarded to Miss Antonia C. Maury, 220
- Carbon Dioxide on the Heart and Circulation : Effects of (Dr. S. N. Mathur), 686
- Carbon Dioxide : Acid-labile, in Mammalian Muscle and the Hydrogen Ion Concentration of the Muscle Fibre (Prof. E. J. Conway and P. J. Fearon), 54
- Carbon Dioxide Content of Atmospheric Air (Dr. E. Glückauf), 620
- Carbon Dioxide and Carbon Dioxide Fixation in Baker's Yeast : Effect of (Dr. Knut M. Brandt), 343
- Carbon Monoxide 'Cool Flame' (Dr. A. G. Gaydon), 259
- Carbonic Anhydrase (Purified) : Activity of (Prof. D. Kellin and Dr. T. Mann), 107 ; (Dr. D. A. Scott and Dr. A. M. Fisher), 711
- Carbonic Anhydrase in Blood : Function of (Prof. J. Fegler), 137
- Carbonic Anhydrase, Sulphonamides and Shell Formation in the Domestic Fowl (R. Benesh, N. S. Barron and C. A. Mawson), 138
- Carbonyls : Two New—Copper and Tellurium (Dr. P. L. Robinson and K. R. Stainthorpe), 24 ; *erratum*, 593
- Caribbean : Higher Education in the, 134
- Caribbean Laboratory (J. M. Jones), 691
- Caribbean Region : Anglo-American Collaboration in the, 320
- Carnation : Fusarium Wilt of the (J. M. Bickerton), 58
- Carnegie : Biological Results of the Last Cruise of the, 89
- Carolina (North) : The Boletaceæ of (Prof. William Chambers Coker and Alma Holland Beers), review by Prof. C. T. Ingold, 667
- Casein Hydrolysate in Experiments on the Nutrition of *Lactobacillus casei* : Use of (Dr. D. E. Dolby and J. W. Waters), 139
- Cataphoretic Velocities of Pure Copper Ferrocyanide Sol (Dr. S. G. Chaudhury and K. L. Bhattacharya), 713
- Catepillar : Tent, in India (K. A. Rahman and A. N. Kalra), 113
- Cation Exchanges during Short-Period Yeast Fermentation : Nature of the (Prof. E. J. Conway and E. O'Malley), 555
- Cattle (Beef) : Breeding of (W. A. Stewart), 172
- Cattle (Dairy) : Breeding of (Dr. Joseph Edwards), 172
- Cattle (Dual-Purpose) : Breeding of (W. S. Mansfield), 172
- Cattle for Milk or Meat : The Breeding of (Dr. John Hammond), 116
- Cattle Fodder from Wood, 249
- Cedar Tree (Alexander L. Howard), 595
- Cell : Distribution of Nucleic Acid in the (H. N. Barber and H. G. Callan), 109
- Cell (Dividing) : Structure of Nucleic Acid in the (Prof. J. Masson Gulland, G. R. Barker and D. O. Jordan), 20
- Cells (Intestinal) : Free Border of (Dr. John R. Baker), 113
- 'Cellulfix' and 'Cellugel' (Swedish Cellulose Co. manufacture of), 616
- Cellulose : Molecular Co-ordination in (Dr. F. T. Peirce), 586
- New Products from, 616
- Cellulose Acetate Mounts for Rock and Mineral Fragments (Capt. A. T. J. Dollar), 226
- Centenaries in 1944 : Scientific (Eng.-Capt. Edgar C. Smith), 14
- Centrifugal Vacuum Freezing (R. I. N. Greaves), 485
- Cepheid Variables : The Pulsation Theory of (Prof. Svein Rosslend), 261
- Cereals (Different) : Activity of the Phytase in, and its Resistance to Dry Heat (Dr. R. A. McCance and Dr. E. M. Widdowson), 650
- Cerebrospinal Meningitis in War-Time, 162
- Ceylon : Birds of, 522
- Chagas's Disease in Brazil (C. Chagas, jun.), 678
- Chalk Brood Attacking a Wild Bee (Dr. Ronald Melville and H. A. Dade), 112
- Chemical Analysis, review, 730
- Chemical Aspects of the Visual Process (Dr. R. A. Morton), 69
- Chemical Control of Insect Pests : Biological Control as a Supplement to (Dr. W. E. Ripper), 448
- Chemical Industries : Training for the (Dr. T. J. Drakeley), 431
- Chemical Industry : Petroleum Refining as a (Dr. F. Kind), 660
- Chemical Industry (German) : Control of, 519
- Chemical Laboratories (Modern Industrial) : Design of (E. D. Mills), 459
- Chemical Legend, A : Wöhler's 'Synthetic' Urea and the Rejection of Vitalism (Dr. Douglas McKie), 608
- Chemical and other Processes : Instruments for the Automatic Controlling and Recording of (Institution of Chemical Engineers and the Institute of Physics joint conference on), 617
- Chemical Reactions : Electronic Theory and (R. W. Stott), review by Dr. E. D. Hughes, 510
- Chemical Structure and Antifibromatogenic Activity of Steroid Hormones (Dr. Alexander Lipschütz), 260
- Chemistry : Electronic Theory in, review by Dr. E. D. Hughes, 510
- The Scope and Limitations of Infra-Red Measurements in (Dr. H. W. Thompson), 79, 209
- Chemistry (Applied) : Dictionary of the (late Prof. Jocelyn Field Thorpe and Dr. M. A. Whiteley), fourth edition revised and enlarged, Vol. 5, *Abridged Index to Vols. 1-5*, and Vol. 6, with Index to Vols. 1-6, review by M. B. Donald, 297
- Reports of the Progress of (Society of Chemical Industry), Vol. 27, 1942, review, 635
- Chemistry : Inorganic (Prof. H. J. Emeléus), review, 237 ; (Fritz Ephraim), English edition by Dr. P. C. L. Thorne and Dr. E. R. Roberts, fourth edition revised, review by Prof. James Kendall, 358
- Chemistry : Organic (Dr. H. B. Watson), review, 237
- Chemistry (Physical) : Elementary (Prof. M. Randall and Prof. L. Esther Young), review, 730
- Introduction to (Prof. Alexander Findlay), second edition, review, 730
- Practical, review by Prof. H. W. Melville, 696
- Chemistry of Drugs : The Natural History and (Sir Henry Dale), 103
- Chemistry of Large Molecules (edited by R. E. Burk and Oliver Grummitt), review by Dr. D. D. Pratt, 270
- Chemistry and the War Effort (J. W. Greene), 583
- Chemists : The Education and Training of (Report of the Chemistry Education Advisory Board), 353
- Chickens : Treatment of a Virus Disease of, with Sulphonamides (F. D. Asplin), 253
- Chicks : Dried Potato Products and Nutritional Encephalomalacia in (R. H. Common and W. Bolton), 744
- Child : The Natural Development of the (Dr. Agatha H. Bowley), second edition, review, 180
- Chile : Poliomyelitis in, 459
- Undulant Fever in (Enrique Onetto), 617
- Chimpanzees, a Laboratory Colony (Prof. Robert M. Yerkes), review by Prof. S. Zuckerman, 65
- China : The Place of Science in (Yap Pow-Meng), 247
- (North-West of) : Science and Technology in the (Dr. Joseph Needham), 238
- Chinese Students : Pharmaceutical Scholarships for, 459
- 'Chloride-secreting Cells' in Macropodus : Sodium Sulphate as an Agent Causing the Development of the (C. K. Liu), 252
- Chlorine under Electrical Discharge : Light-Effect in—Influence of the Gas Pressure (Prof. S. S. Joshi and P. G. Deo), 434
- Cholinesterase : Plasma, in Male and Female Rats (Dorothy B. Mundell), 557
- Chondroitinsulphuric Acid (Hyaluronic Acid and) : Molecular Shape and Size of (Prof. Gunnar Blix and Olle Snellman), 587
- Chromosome Breakage : Ionization and (Dr. D. G. Catcheside and D. E. Lea), 465
- Chromosomes of British Plants : Supplement to the Merton Catalogue of (J. P. Rutland), 249
- 'Chromosomin' and Nucleic Acids (Torbjörn Caspersson), 499 ; (Dr. Edgar and Mrs. Ellen Stedman), 500
- Chungking Industrial and Mining Exhibition (Dr. Joseph Needham), 672
- Ciné-Films : Science Class Lecture (Dr. Quintin Moore, Thos. Smith Wylie and Frank G. Conway), 784
- Circuit-Breaker Technique : High-Voltage (J. A. Harle and R. W. Wild), 627 ; (H. E. Cox and T. W. Wilcox), 627
- Circulation (Heart and) : Effects of Carbon Dioxide on the (Dr. S. N. Mathur), 686
- Citizenship : Training for (Report of the Advisory Council on Education in Scotland), 265 ; (G. E. Cleaver), 437
- Classification in Biology (K. H. Chapman), 768
- Classification of Diseases and Injuries for Use in Compiling Morbidity Statistics : A Provisional (Medical Research Council, Special Report Series No. 248), 584
- Claviformin from *Aspergillus giganteum* Wehm. (Prof. H. W. Florey, M. A. Jennings and Flora J. Philpot), 139
- Cleansing of Milk Bottles (Dr. G. Lapage), 31
- Climate (Hot, Dry) : Production of Seed Potatoes in a (Dr. J. E. van der Plank), 589
- Clostridium oedematiens* : Bacteriological Diagnosis of Gas Gangrene due to (Dr. F. P. O. Nagler), 496
- Cloud Reading for Pilots (A. C. Douglas), review, 96
- Clouds : Interstellar Calcium, 319
- Structure of, review, 96
- Clouds and Weather Phenomena (C. J. P. Cave), second edition revised, review by Prof. D. Brunt, 237
- Clovers (Forage Grasses and) : Leaf Lipids of (F. B. Shorland), 168

- Clubs and Club Making (edited by Dr. J. Macalister Brew), *review*, 272
- Coal for Small-Scale Uses : The Future of (J. G. Bennett), 338
- Coals and Coke : Ultra-fine Structure of (British Coal Utilisation Research Association), *review*, 697
- Cohesion of a Solid : Influence of an Adsorbed (Inner) Layer on the (Prof. Carl Benedicks and Per Sederholm), 109 ; (L. C. Bannister), 315
- Coincidences (n-fold Accidental) : Rate of (Dr. L. Jánossy), 165, 592 ; (Prof. Erwin Schrödinger), 592
- Coke (Coals and) : Ultra-fine Structure of (British Coal Utilisation Research Association), *review*, 697
- Colchicine : Application of, to *Delphinium cardinale* (G. H. L. Mehlquist, C. O. Blodgett and L. Bruscia), 28  
Effect of, on Golgi Bodies (C. L. Foster), 556
- Collaboration in Colonial Territories : Functional (Lord Listowel), 159 ; (Lord Cranborne), 159
- Colombia : Public Health in (Dr. Eduardo Santos), 340
- Colombian Hypericum (Jose Cuatrecasas), 402
- Colonial Development : Contrast to Partnership in, 691
- Colonial Development and Welfare Act : Grant to enable a tuberculosis survey to be made in Fiji, 193
- Colonial Geological Surveys : Function and Future of (V. A. Eyles), 273 ; (Dr. J. D. Falconer), 409 ; (Imperial Institute), 582
- Colonial Research and Development, 119
- Colonial Service : Appointments and promotions, 51, 249, 282, 403, 492, 617, 741
- Colonial Territories : Functional Collaboration in (Lord Listowel), 159 ; (Lord Cranborne), 159
- Colonies : A Review of Geological Survey Work in the (Imperial Institute), 582  
The Veterinarian and the (Major J. M. Smith), 60
- Colonization Europea : Ideas sobre los fundamentos Bioclimaticos y Biogeograficos para una (Walter Knoche), 192
- Colonization : Problems of, 192
- Colour of Small Objects (E. N. Willmer), 774
- Colour-Blind Relatives : Women with (Dr. R. W. Pickford), 409
- Colour Blindness : The Ishihara Test for (Dr. R. W. Pickford), 656  
Total, of Hysterical Origin (Dr. R. W. Pickford), 256
- Colour Sensations in Man's Colour Sense : The Fundamental (Gastaf F. Göthlin), *review* by Prof. H. E. Roaf, 235
- Colour-Vision Weakness : Incidence of (Dr. Robert C. Gray), 657
- Colours (Biological) : Names of (H. A. Dade), 220
- Comet Peltier-Kellaway, 105
- Comet Schaumasse : Re-discovery by Strömgren and Lundmark, 522
- Comets : Physical Properties of (Dr. N. T. Bobrovnikoff), 770  
Polyatomic Emission in the Visual Spectra of, 59
- Community in Africa : Education and the (Prof. Daryll Forde), 606
- Compass : Aeroplane, 679
- Compass System : Gyro Flux Gate, 679
- Competition : Antibiotics and (Prof. E. J. Salisbury), 170
- Compounds (Organic) : Dictionary of (edited by Prof. I. M. Heilbron and H. M. Bunbury), Vol. 2 : Ecaine—Myrtillin Chloride, Vol. 3 : Naphthacarbazole—Zygadenine, *review*, 668  
A New Technique for the Ultimate Microanalysis of (R. Belcher and C. E. Spooner), 24
- Conception : Intelligence and Season of (Dr. J. Fraser Roberts), 401
- Conductor Sagging on Overhead Lines (C. O. Boyse and N. G. Simpson), 192
- Configurations of Molecules Occupying Several Sites : Number of (Dr. E. A. Guggenheim), 255, 406
- Connaissance mathématique : Études sur la (Prof. Thomas Greenwood), *review* by Prof. E. T. Whittaker, 268
- Conscience and Society (Dr. Ranyard West), *review* by Dr. R. W. Pickford, 123
- Context : Relation between Dissonance and (Dr. R. W. Pickford), 85
- Continental Drift and Plant Distribution (Prof. D. H. Campbell), 717
- Contraction : Adenosine-triphosphate Initiating, and Changing Bi-refringence in Isolated Cross Striated Muscle Fibres (Dr. Fritz Buchthal, Adam Deutsch and G. G. Knappes), 774
- Contraction of Unstriated Muscle : Viscosity and (Major Inderjit Singh), 591
- Contraction, Turgor and the Cytoskeleton of Nerve Fibres (J. Z. Young), 333
- Co-operation : International, in Telecommunications, 567
- Coopers Hill War Memorial Prize and Medal for 1943 awarded to Harold Page, 312
- Copernicus to Einstein : From (Hans Reichenbach), translated by Ralph B. Winn, *review* by Sir Harold Spencer Jones, 67
- Copper Conductors for Overhead Lines (G. W. Preston and H. G. Taylor), 616
- Copper Ferrocyanide Sol (Pure) : Cataphoretic Velocities of (Dr. S. G. Chaudhury and K. L. Bhattacharya), 713
- Copper and Tellurium Carbonyls (Dr. P. L. Robinson and K. R. Stainthorpe), 24 ; *erratum*, 593
- Coral Atoll : Vertical Section of a (Admiral Sir John Edgell), 680
- Corona (Solar) : Constitution of the (H. Alfvén), 59
- Corrosion of Lacquered Steel Surfaces : Filiform Underfilm (C. F. Sharman), 621
- Cosmic Rays : Nuclear Disintegrations Produced by (M. Goldhaber), 221  
Absorption in the Atmosphere and Decay of (Prof. A. Dupierre), 529
- Costa Rica : Public Health in (Dr. Rafael A. Calderón Guardia), 617
- Cotton Soil (Black) : Nitrogenous Manuring of (Dr. A. Sreenivasan), 55
- Cottons (New World) : Phenogenetic Evidence for the Amphiploid Origin of (S. G. Stephens), 53
- p-Cresol and Estrone in Urine (N. R. Campbell and Dr. D. H. Hey), 745
- Crime : Race and (Willem Adriaan Bongers), translated from the Dutch by Margaret Mathews Hordyk, *review* by Prof. Cyril Burt, 509
- Crimea : Pre-Neanderthal Man in the (Sir Arthur Keith), 515
- Croonian Lecture of the Royal College of Physicians for 1942 (Dr. Donald Hunter), 412
- Crop Plants (Economic) : Improvement of, 499
- Crop Production (Improved) : Recent Advances in Botany in relation to (Dr. T. S. Sabinis), 499
- Crops in England and Wales for the Years 1933-1942 : Report on Fungus, Bacterial and other Diseases of (Ministry of Agriculture and Fisheries Bulletin No. 126), *review* by Dr. John Grainger, 447
- Crossing-over in the Males of *Drosophila subobscura* (Ursula Philip), 223
- Cryoscopic Equation : A Modification to the (A. V. Brancker, S. J. Leach and V. A. Daniels), 407
- Crystall Face (Quartz) : Topography of a (Dr. S. Tolansky), 195
- Crystal Perfection : X-Ray Divergent-Beam Photography as a Test of (Dr. Kathleen Lonsdale), 433
- Crystal Surfaces : An Interferometric Procedure for the Examination of (Prof. Manne Siegbahn), 435 ; (Dr. S. Tolansky), 435
- Cystallography : International Development of (Dr. P. P. Ewald), 535
- Cullum Medal of the American Geographical Society awarded to Arthur R. Hinks, 431
- Cultural Subject : Mathematics as a (P. J. Wallis), 26
- Current : 'Magnetic' (James T. Kendall), 157
- Currents (Superimposed) : Remote Switching by (J. L. Carr), 708
- Cyanamide : Tautomerism of (Dr. L. Hunter and H. A. Rees), 284
- 61 Cygni : The Planetary Companion of (Dr. Robert Aitken), 491 ; (Prof. H. N. Russell), 491
- 61 Cygni and 70 Ophiuchi (Systems) : Probable Physical Characteristics of the Quasi-Planets recently found in the (Prof. H. N. Russell), 59
- Cytochemistry : Frontiers in (edited by Prof. Normand L. Hoerr), *review* by Dr. F. Dickens, 327
- Cytoskeleton of Nerve Fibres : Contraction, Turgor and the (J. Z. Young), 333
- D**ALY Medal of the American Geographical Society awarded to Sir Halford Mackinder, 431
- Danmarks Stenaler : Landnam i (Johs. Iversen), 511
- Darwin (Horace) Fund created by the Royal Society, 739
- Darwin Lecture of the Royal Astronomical Society (Prof. Svein Rosseland), 261
- Davidson Current : Counterpart of the (Prof. Elliot G. Mears), 346
- Deafness (Hearing and) : Measurement of (M. B. Gardner), 87  
Research into Problems of, 522
- Dealkylation of Phenolic Ethers (Dr. Fawzy Ghali Baddar), 377
- Deep : The Foundations of the, *review* by Prof. Arthur Holmes, 389
- Deformation of Rubber-like Materials (J. E. Moyal), 777
- Dehydrated Graphite Sols (Bernard H. Porter), 161
- Dehydroascorbic Acid : Role of Phosphate in the Methylene Blue Reduction by (Dr. L. Frankenthal), 255
- Delphinium cardinale* : Application of Colchicine to (G. H. L. Mehlquist, C. O. Blodgett and L. Bruscia), 28
- Demobilization and Employment (P. E. P. Broadsheet No. 217), 507
- Denmark's Stone Age : Land Occupation in (Johs. Iversen), 511
- Density in Silver Alloys : Correlation of Thixotropic Setting with (Dr. D. R. Hudson), 562
- Deposits on Economizer Heating Surfaces : Bonded (J. R. Rylands and J. R. Jenkinson), 29
- Design of Electrical Installation Equipment : The Influence of Maintenance Requirements on the (H. Drake), 430
- Development : Colonial Research and, 119  
Genes and (H. Grüneberg), 28  
Scientific Research and (White Paper on), 519
- Development of the Child : The Natural (Dr. Agatha H. Bowley), second edition, *review*, 180
- Development in Drosophila, 28
- Development in India : Scientific Research and, 429
- Development Advisor for West Africa, 18
- Diamond : Lattice Constant of, and the C-C Single Bond (Dr. D. P. Riley), 587
- Diamonds : J. B. Hannay and the Artificial Production of (Sir James Weir French), 112  
Properties and Uses of, 249  
Natural and Artificial (Dr. Kathleen Lonsdale), 669
- Dichroism (Dr. W. D. Wright), 9
- Dictionary of Applied Chemistry (the late Prof. Jocelyn Field Thorpe and Dr. M. A. Whiteley), fourth edition revised and enlarged, Vol. 5. Abridged Index to Vols. 1-5, and Vol. 6, with an Index to Vols. 1-6, *review* by M. B. Donald, 297
- Dictionary of Organic Compounds (edited by Prof. I. M. Heilbron and H. M. Bunbury), Vol. 2 : Ecaine—Myrtillin Chloride, Vol. 3 : Naphthacarbazole—Zygadenine, *review*, 668
- Dielectric Constant of Liquids and Solids and Dipole Moments : Relationship between (S. K. Kulkarni Jatkari), 222
- Diesel Engines : Poisonous Gases in the Exhaust of (Dr. Enrique Castellano), 105
- Diet : Unconsidered Trifles in our (Sir J. C. Drummond and Dr. T. Moran), 99
- Dietary Surveys of Families and Individuals : Budgetary and (Nutrition Society conference on), 306, 585
- Diffraction : Electron, of Amorphous Polymers (G. D. Coumoulos), 259
- Diffusion Phenomena in Alternating Current Arcs (J. J. O'Doherty), 558
- 1,2-Diketones in Sunlight : Reactions of Ethylenes with (Prof. Alexander Schönberg and Ahmed Mustafa), 195
- Dimethyl Ether Compound with Boron Trifluoride (S. H. Bauer, G. R. Finlay and A. W. Laubengayer), 114
- 2,4-Dinitrophenylhydrazine : Slow Protein Hydrolysis in the Presence of (Dudley F. Cheesman and Gösta C. H. Ehrensård), 108
- Dinosaur : A Canadian (Barnum Bosta and E. M. Schlackjer), 465
- Diphtheria : Duration of Immunization against (H. Lyndhurst Duke and W. B. Stott), 318
- Dipole Moments : Relationship between Dielectric Constant of Liquids and Solids and (S. K. Kulkarni Jatkari), 222
- Dipole Moments of Polyatomic Molecules (S. K. Kulkarni Jatkari), 316
- Dipole Transmitting Arrays (Horizontal) : The Measured Performance of (Harold Page), 312
- Disease (Epidemic) : The Conquest of (Charles-Edward Amory Winslow), *review* by Major J. Marshall, 475
- Disease (Helminthic) : Changed Viewpoints in (Dr. N. R. Stoll), 626
- Diseases : Parasitic, of Man in relation to the War (Dr. G. Lapage), 625
- Diseases and Injuries : A Provisional Classification of, for Use in Compiling Morbidity Statistics (Medical Research Council, Special Report Series No. 248), 584
- Disinfection : Aerial (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 20 ; (L. J. White, A. H. Baker and C. T. Twort), 141
- Disintegration of Nitrogen by Fast Neutrons (P. Comparat), 720
- Disk-Harrowing versus Ploughing, *review* by Dr. R. K. Schofield, 391
- Dissociation in Flame Gases : Abnormal (Dr. A. S. Leah), 23
- Dissociation Constant  $K_2$  of para-Phenol Sulphonic Acid : Thermodynamic Second (R. G. Bates, G. L. Siegel and S. F. Acree), 532

- Dissociation Energy of Nitrogen (Dr. A. G. Gaydon), 407  
 Dissonance and Context: Relation between (Dr. R. W. Pickford), 85  
 Divergence Difficulties in Quantum Theory: An Unambiguous Method of Avoiding (Prof. E. C. G. Stueckelberg), 143  
 Donnan Membrane Potential (Dr. S. G. Chaudhury), 593  
 Dream Island Days (R. M. Lockley), review by Sir D'Arcy Thompson, 270  
 Drill (*Mandillus leucophaeus*): An Undescribed Feature in the (Prof. W. C. Osman Hill), 199  
*Drosophila melanogaster*: Eye Genes in (Dr. C. H. Waddington and R. W. Pilkington), 28  
   Leg Genes in (Dr. C. H. Waddington), 28  
*Drosophila Mutants*: Eye Responses of (Dr. H. Kalmus), 465  
*Drosophila pseudo-obscura*: Genotypes of Different Strains of (R. Lamy), 531  
*Drosophila subobscura*: Crossing-over in the Males of (Ursula Philipp), 223  
 Drugs: Repeated Doses of (Prof. J. H. Gaddum), 494  
   The Natural History and Chemistry of (Sir Henry Dale), 103  
   Origin and Action of (Henry McIlwain), 300  
 Dry Rot of Potato: The Soil as a Source of Infection of (Dr. T. Small), 436  
 Drying: Preservation of Foods by (Dr. Franklin Kidd), 100  
 Dryopteris: Experimental Observations on the Relation between Leaf Development and Stellar Morphology in Species of (Prof. C. W. Wardlaw), 377  
 Dublin (Trinity College): Centenary of Zoological Teaching in (Prof. J. Bronft Gatenby), 723  
 Duddell Scholarship of the Institution of Electrical Engineers, 312  
 Dusts on Insects (Inert): Action of (Dr. V. B. Wigglesworth), 493; (Dr. H. Kalmus), 714  
 Dyes in Non-aqueous Solvents: Solubilization of (Dr. S. R. Palit), 317
- EARTH**: Measuring the Distance of the Sun from the (Sir Harold Spencer Jones), 181  
 Earth-Model: Meteorites and an (Prof. R. A. Daly), 718  
 Earthquake in Alaska on November 3, 163; in south-eastern Alaska on February 3, 708  
   in the Argentine on January 15, 708; on January 16, 741  
   in Assam on October 23, 163  
   in the Banda Sea on November 6, 163  
   in south-west Bolivia on December 1, 554  
   in Mexico on January 10, 708  
   east of New Guinea on December 23, 554  
   in the Pacific Ocean on October 21, 163  
   in southern Peru on February 29, 649  
   in Turkey on February 1, 193, 554  
   in the Gulf of Venezuela on December 21, and on December 23, 554  
 Earthquake: The Argentine (Ernest Tillotson), 132  
 Earthquakes: registered at Fiji, 522  
   registered at Kew, 163, 554, 649  
   registered in New Zealand during September, 163; during November, 402; during December, 431  
   registered in Spain during September, 163; during November, 402; during December, 431; during January, 741  
   registered at Toledo during February, 649  
 Earthquakes: Recent, 163, 431, 649, 708  
 Earth-Fault Relay Equipment for use on Systems Protected by Petersen Coils: Modern (L. B. S. Golds and C. L. Lipman), 469  
 Earth's Atmosphere: Lunar Eclipses and the (Daniel Barbier, Daniel Chalonge and Ernest Vigroux), 708  
 Ecology: Nature Conservation and, 568  
 Ecology and Evolution: Excretions, (Dr. C. E. Lucas), 378  
 Economic Exploitation of Europe and its Consequences, 686  
 Economic System: Relation of Employment to an, 615  
 Economic Thought: The Ideal Foundations of (Dr. W. Stark), review by M. H. Dobb, 236  
 Economics: Philosophy of, review by M. H. Dobb, 236  
 Economics of Poor Land Arable Farming (Dr. S. M. Makings), review, 757  
 Economics in the International Sphere: Trade and, 411  
 Economizer Heating Surfaces: Bonded Deposits on (J. R. Rylands and J. R. Jeunisson), 29  
 Edinburgh Medical Men and the Great Adventure (Prof. James Ritchie), 280  
 Edison Medal for 1943 of the American Institute of Electrical Engineers awarded to Dr. Vannevar Bush, 282  
 Educated? It is my Business, 220  
 Education: Agricultural (Agricultural Education Association conference on), 116  
   Agricultural, in Great Britain, 190  
   English (P. R. Morris), 372  
   Higher, in the Caribbean, 134  
   Mass, in African Society (Report of the Colonial Office Advisory Committee on Education in the Colonies), 607  
   Medical (Dr. K. V. Krishnan), 658  
   Medical, in India (Dr. G. Lapage), 658  
   Medicine and (Sir John Graham Kerr), 133  
   Regional, review by Prof. James Ritchie, 328  
   (Secundary) The Open Door in (Nuffield College Social Reconstruction Survey Education Sub-Committee), 17  
   Secundary, in Great Britain, 17  
   (Technical): Committee on, 458  
   Technical, of the Future (Dr. D. S. Anderson), 561  
   A Turning Point in, review by Sir Fred Clarke, 177  
   Post-War University (C. D. Hardie), 57; (Dr. Maxwell Garnett), 142  
   Veterinary, in Great Britain (A. W. Whitehouse), 227  
 Education, 1939-40: Bibliography of Research Studies in, review by T. Raymont, 207  
 Education for Engineers (Dr. Raymond Priestley), 429  
 Education in Transition (H. C. Dent), review by Sir Fred Clarke, 177  
 Education for the Veterinary Profession, 35  
 Education and the World State, review by Prof. R. A. C. Oliver, 755  
 Education and the Community in Africa (Prof. Daryll Forde), 606  
 Education and Training of Chemists (Report of the Chemistry Education Advisory Board), 353  
 Education Bill, 1  
 Education Question, a Biological Approach, 133  
 Educational Reconstruction in India (T. Raymont), 467; (John Sargent), 467  
 Educational Reconstruction Plans: United Nations, 520  
 Effect (Maximum): Application of the Principle of (Dr. Hugh Nicol), 623  
 Egg Albumin: Molecular Weight of (Herbert Gutfreund), 406  
 Egg-Shells: Fluctuations in the Porosity of (D. J. G. Black and Dr. Cyril Tyler), 682  
 Eighth Army in North Africa: The Hygiene of the (Lieut.-Colonel H. S. Gear), 688  
 Einstein: From Copernicus to (Hans Reichenbach), translated by Ralph B. Winn, review by Sir Harold Spencer Jones, 67  
 Eire: Mineral Resources of (D. W. Bishop), 532  
 El Alamein Victory: Hygiene Aspects of the (Lieut.-Colonel H. S. Gear), 688  
 Electric Cables: Thermoplastic (Dr. H. Barron, J. N. Dean and T. R. Scott), 248  
 Electric Polarizations in Extremely Dilute Solutions (R. Davis, H. S. Bridge and W. J. Svirbely), 258  
 Electric Power Stations (T. H. Carr), Vol. 1, second edition, review by C. W. Marshall, 729  
 Electrical Aspect of Farm Mechanisms (C. A. Cameron-Brown), 585  
 Electrical Installation Equipment: The Influence of Maintenance Requirements on the Design of (H. Drake), 430  
 Electrical Sheet Steels for Power Plant and the Factors Affecting their Magnetic Properties: A Survey of (F. Brailsford), 192  
 Electrical Technology: Plastics and (Plastics Group of the Society of Chemical Industry and the Institution of Electrical Engineers discussion on), 641  
 Electricity in Mines: Transmission and Distribution of (B. L. Metcalf), 219  
 Electricity and Radio Transmission (Sir John Townsend), review, 237  
 Electricity Supply in Great Britain, 382  
 Electricity Supply System Load Analysis (P. Schiller), 430  
 Electrodynamic: Non-linear Optics and (Prof. E. Schrödinger), 532; (J. McConell), 532; (W. Heitler and H. W. Peng), 532  
 Electrolysis of Water: The Production of Hydrogen and Oxygen by the (C. E. Bowen), 78  
 Electrolytes: Base, for use in Polarographic Determinations (H. Wolfson), 375  
 Electrolytic Production of Hydrogen and Oxygen, 78  
 Electromagnetic Radiation: Ground and Cloud Scatter of (T. L. Eckersley, G. Millington and J. W. Cox), 341  
 Electrometria, La (Gustavo Avé Lallemant), 77  
 Electron Diffraction of Amorphous Polymers (G. D. Coumoulos), 259  
 Electron Lenses: Electrostatic (K. Spangenberg and L. M. Field), 441  
 Electron Microscopy (J. H. L. Watson), 465  
 Electronic Theory and Chemical Reactions (R. W. Stott), review by Dr. E. D. Hughes, 510  
 Electrostatic Electron Lenses (K. Spangenberg and L. M. Field), 441  
 Elephants: History of, review by Prof. D. M. S. Watson, 5  
 Elm Flora: The British (Dr. R. Melville), 198; (Alexander L. Howard), 198  
 Embryo: A Human, Nine to Ten Days Old (Prof. Francis Davies), 463  
 Embryological Treatises of Hieronymus Fabricius de Aquapendente (Prof. Howard B. Adelmant), review by Prof. F. J. Cole, 149  
 Embryos: Early Human (Prof. W. J. Hamilton and Prof. J. D. Boyd), 684; (Prof. Francis Davies), 684  
 Emergency Lighting Systems: Applications of (S. H. Chase), 79  
 Employment: Demobilization and, in Great Britain, 355  
   Industrial Policy and, in Great Britain, 355  
   Relation of, to an Economic System, 615  
 Employment After the War (Social Credit Co-ordinating Committee Memorandum), 615  
 Employment in the North-East (Post-War): Considerations Affecting (Northern Industrial Group), 505  
 Encephalomalacia in Chicks (Nutritional): Dried Potato Products and (R. H. Common and W. Bolton), 744  
 Endemic Areas of Trichinosis in Great Britain: A Search for (E. L. Taylor), 745  
 Enemy Airborne Radio Equipment (C. P. Edwards), 290  
 Energy among the Stars of the Galaxy: Partition of (— Vysotsky and — Williams), 114  
 Energy-Levels: Nuclear (Dr. F. C. Champion), 720  
 Engineering Works: Office Organization and, 769  
 Engineers: Education for (Dr. Raymond Priestley), 429  
   A Geology for (F. G. H. Blyth), review by Prof. O. T. Jones, 476  
 England and Wales: Report on University Entrance Scholarships in (British Association Committee on Post-War University Education), 4  
 English: Basic (Report of the Committee of Ministers on), 339  
   Basic, and its Uses (I. A. Richards), review by Dr. Maxwell Garnett, 205  
 English Education (P. R. Morris), 372  
 English Ophthalmology: History of (R. R. James), 384  
 Entomological Control of St. John's Wort (*Hypericum perforatum* L.), (Frank Wilson), 785  
 Entropy: Evolution and (E. H. Betts), 402  
 Ephemerides for the Determination of Time Corrections by Equal Altitudes (Zinger's Method) for 1941 (Astronomical Institute of Sciences of the U.S.S.R.), 29  
 Epidemic Disease: The Conquest of (Charles-Edward Amory Winslow), review by Major J. Marshall, 475  
 Equilibrium Diagram of the System Aluminium-Zinc (G. V. Raynor), 220  
 Ermine Moths in Ireland: Small (Bryan P. Beirne), 413  
 Erysiphe: Reaction of Wheat Varieties Grown in Britain to (Dr. S. Ellerton), 776  
 Erythrocytes Irradiated *in vitro*: Effect of X-Rays on (Dr. L. Halberstaedter), 683  
 Ethers (Phenolic): Dealkylation of (Dr. Fawzy Ghali Baddar), 377  
 Ethics: Evolutionary (Prof. Julian S. Huxley), review by J. S. L. Gilmour, 94  
 Ethylenes with 1,2-Diketones in Sunlight: Reactions of (Prof. Alexander Schönberg and Ahmed Mustafa), 195  
 Europe: The Displacement of Population in (Prof. E. M. Kulischer), 148  
   Occupied—German Exploitation and its Post-War Consequences (Royal Institute of International Affairs), 686  
 Europe (*Homo neanderthalensis* in): *Homo sapiens* in Australia contemporary with (Dr. F. E. Zeuner), 622  
 Europe (Post-War): Some Implications of Population Change for (F. W. Notestein), 33  
 Europe's Overseas Needs 1919-20 and How they were Met (Economic, Financial and Transit Department of the League of Nations), 159  
 Europea (Colonization): Ideas sobre los fundamentos Bioclimáticos y Biogeográficos para una (Walter Knoche), 192  
 Evolution of Animals (Adaptive): Population Dynamics and (S. A. Sewertzoff), review by Dr. B. P. Uvarov, 66

- Evolution and Entropy (E. H. Betts), 402  
 Evolution : Excretions, Ecology and (Dr. C. E. Lucas), 378  
 Evolutionary Ethics (Prof. Julian S. Huxley), review by J. S. L. Gilmour, 94  
 Ewing Medal for 1943 awarded to Group Captain Frank Whittle, 554  
 Examination Subject (Compulsory) : Mathematics as a (D. Brownlie), 281  
 Examinations : The Case for (J. L. Brereton), review by T. Raymont, 728  
 Excretions, Ecology and Evolution (Dr. C. E. Lucas), 378  
 Exhaust of Diesel Engines : Poisonous Gases in the (Dr. Enrique Castellano), 105  
 Exhibition : Chungking Industrial and Mining (Dr. Joseph Needham), 672  
 Explanation : The Nature of (Dr. K. J. W. Craik), 605  
 Extrusion of Metals (Claude E. Pearson), review by Prof. F. C. Thompson, 696  
 Eye Genes in *Drosophila melanogaster* (Dr. C. H. Waddington and R. W. Pilkington), 28  
 Eye Responses of *Drosophila* Mutants (Dr. H. Kalmus), 465
- F**ACTORS Influencing Mutability : Effect of (Dr. S. Zamenhof), 169  
 Factory : The Forest as a (Prof. E. P. Stebbing), 243  
 War (A Report by Mass Observation), review by Prof. T. H. Pear, 178  
 Factory Medical Services and Industrial Diseases (London School of Hygiene and Tropical Medicine week-end course for medical practitioners), 312  
 Families and Individuals : Budgetary and Dietary Surveys of (Nutrition Society conference on), 306, 585  
 Family, Population and Race : Individual, (Prof. Franz Boas), 33  
 Far East (New World and) : Early Spanish Possessions of the, review by Dr. J. N. L. Baker, 299  
 Faraday Medal of the Institution of Electrical Engineers awarded to Dr. Irving Langmuir, 190  
 Farm : Island (Dr. F. Fraser Darling), review by Seton Gordon, 390  
 Farm Animals : Control of Ovation in (John Hammond, jun.), 702  
 Farm Machines : Types and Varieties of (C. Davies), 117  
 Farm Mechanisms : Electrical Aspect of (C. A. Cameron-Brown), 585  
 Farming : Pioneering, on a Western Scottish Island, review by Seton Gordon, 390  
 Farming (Poor Land Arable) : The Economics of (Dr. S. M. Makings), review, 757  
 Fat : The Metabolism of (Dr. Ida Smedley-Maclean), review by Dr. A. Kleinzeller, 510  
 Fat of Sow's Milk (P. B. D. de la Mare and F. B. Shorland), 380  
 Fatigue of Metals : Thermal (W. Boas and R. W. K. Honeycombe), 494 ; *erratum*, 770  
 Fauna and Flora : Merseyside, 161  
 Fels Planetarium at the Franklin Institute (Roy K. Marshall), 616  
 Ferns (Onocleoid) : Bud Regeneration at Cut Parenchymatous Surfaces in (Prof. C. W. Wardlaw), 588  
 Fertility in Canada : Differential (Enid Charles), 402  
 Fertilization Membrane in the Sea Urchin Egg : Mechanism of Formation of (Prof. John Runnström, Dr. Ludwik Monné and Miss Elsa Wicklund), 313  
 Fever : Undulant, in Chile (Enrique Onetto), 617  
 Fibrinogen (L. B. Jaques), 58  
 Fields : Statistical Mechanics of, and the 'Apeiron' (Prof. Max Born and H. W. Peng), 164  
 Fiji : Earthquakes registered at, 522  
 Tuberculosis Survey in, 193  
 Filiform Underfilm Corrosion of Lacquered Steel Surfaces (C. F. Sharman), 621  
 Fir to Fodder, 249  
 Fire Risks : Industrial (W. Fordham Cooper and F. H. Mann), 248  
 Fish-Farming Experiment in a Sea Loch (Dr. F. Gross and J. E. G. Raymont and Dr. S. M. Marshall and Dr. A. P. Orr), 483  
 Fishes : Blennioid (Earl D. Reid), 465  
 Fishes of Bengal (Common Food) : Studies on Myxosporidia from the (M. Chakravarty), 113  
 Fishes from the Philippine Seas (Henry W. Fowler), 135  
 Flaking of Flint : High-Angle Edge (Alfred S. Barnes), 226 ; (Henry Bury), 227 ; (D. F. W. Baden-Powell), 227  
 Flame Gases : Abnormal Dissociation in (Dr. A. S. Leah), 23  
 Flames : Simple Sensitive (G. A. Sutherland), 376 ; (Prof. E. N. da C. Andrade), 498  
 Flax : Grey Mould (*Botrytis cinerea*) of (Dr. John Colhoun), 25  
 (Retting of) : Spore-forming Bacteria causing Soft Rot of Potato and (L. A. Allen), 224  
 Flight : Human Limits in (Dr. Bryan H. C. Matthews), 698  
 Flint : High-Angle Edge Flaking of (Alfred S. Barnes), 226 ; (Henry Bury), 227 ; (D. F. W. Baden-Powell), 227  
 'Floating Drop' : Adsorption as the Cause of the Phenomenon of the, and Foam consisting solely of Liquids (Prof. Carl Benedicks and Per Sederholm), 80  
 Flocculation in Solutions and Suspensions (Dr. E. Mardles), 746  
 Floor of the Ocean (Prof. Reginald Aldworth Daly), review by Prof. Arthur Holmes, 389  
 Flora : The British Elm (Dr. R. Melville), 198 ; (Alexander L. Howard), 198  
 Flora of the British Isles : Biological (British Ecological Society), 425  
 Flora (Fauna and) : Merseyside, 161  
 Floras (Fossil) : Continental Drift and, 717  
 Flour and Bread (National) : Fourth Report on (Scientific Adviser's Division of the Ministry of Food), 154  
 Flowering (Modern) : Towards a Physiological Interpretation of (Prof. J. McLean Thompson), 163  
 Fluorescence as an Aid to Physiology (Dr. D. R. Peacock), 136  
 Fluorescence Spectra of Naphthalene Molecules in Solid Solution of Anthracene with the Variation of Wave-lengths (S. C. Ganguly), 652 ; (E. J. Bowen), 653  
 Flux Density in Large Transformers : Economic (D. J. Bolton), 19  
 Fly-Sprays : Activation of Pyrethrins in (W. A. L. David and P. Bracey), 594  
 Foam consisting solely of Liquids : Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and (Prof. Carl Benedicks and Per Sederholm), 80  
 Fodder from Wood : Cattle, 249  
 Folk-Lore : Rhinology and (Dr. J. D. Rolleston), 648  
 Folly (Human) : Genealogy of (Prof. George Catlin), 61  
 Food : Freedom from Want of (Association of Scientific Workers (Watford Branch) conference on), 750  
 Fungi for (Dr. J. Ramsbottom), 105  
 Food in the War Effort : The Place of (L. E. Cull), 583  
 Food-Poisoning (Elliot B. Dewberry), review by Dr. Robert Cruickshank, 418  
 Food Production in India (Ras Bahadur Dr. D. V. Bai), 750  
 Foods : Preservation of, by Drying (Dr. Franklin Kidd), 100  
 Forage Grasses and Clovers : Leaf Lipids of (F. B. Shorland), 168  
 Foraminifer (Pelagic) : Biology, Ecology and Morphogenesis of a (Dr. Earl H. Myers), 322  
 Forest as a Factory (Prof. E. P. Stebbing), 243  
 Forest Clearance : Neolithic (Dr. H. Godwin), 511  
 Forest Products (W. A. Robertson), 689  
 Forest Research in India and Burma, 1941-42, Part I, The Forest Research Institute, 201  
 Forestry at Bangor : University Chair in, 103  
 Forestry in War-time : Australian, 490  
 Formaldehyde : Reaction between Proteins and (Dr. R. L. Wormell and Maurice A. G. Kaye), 525  
 Formalization of Logic (Prof. Rudolf Carnap), review, 8  
 Formicidae : List of the Type Species of the Genera and Subgenera of the (H. Donisthorpe), 322  
 Fossil Floras : Continental Drift and, 717  
 Foundations of the Deep, review by Prof. Arthur Holmes, 389  
 Four-Colour Problem (Dr. S. M. de Backer), 710  
 Fowl (Domestic) : Carbonic Anhydrase, Sulphonamides and Shell Formation in the (R. Benesh, N. S. Barron and C. A. Mawson), 138  
 Fowls : Riboflavin Deficiency in, 78  
 Foyle Prize Essay (N. Teich), 42  
 France : The Health of, 340  
 Frankland Medal and Prize of the Royal Institute of Chemistry awarded to Dudley Rhoden Scarffe, 372  
 Franklin Medals for 1944 awarded to Dr. W. D. Coolidge and to Dr. P. Kapitza, 741  
 Fraunhofer Lines at the Sun's Limb : Polarization in (R. O. Redman), 718  
 Free Border of Intestinal Cells (Dr. John R. Baker), 113  
 Freedom : A Philosophy of, review by F. Ian G. Rawlins, 150  
 Freedom from Want of Food (Association of Scientific Workers (Watford Branch) conference on), 750  
 Freezing : Centrifugal Vacuum (R. I. N. Greaves), 485  
 Frequency Performance of Quartz Plates (W. P. Mason), 598  
 Fruit Trees : Mineral Deficiencies in (J. B. Duggan), 28 ; (D. W. Goodall), 28  
 Frustration and Fulfilment in Adolescence : The Psychology of (Course of lectures arranged by the National Council for Mental Hygiene), 79  
 Fuel for Household Use, 338  
 Fulfilment in Adolescence (Frustration and) : The Psychology of (Course of lectures arranged by the National Council for Mental Hygiene), 79  
 Fumigacin : Identity of Helvolic Acid, 531  
 Function and Synthesis of Polysaccharides : Structure, (Prof. W. N. Haworth), 785  
 Functions : The Theory of (W. W. Sawyer), 536  
 Fungi for Food (Dr. J. Ramsbottom), 105  
 Fungi and Modern Affairs (Dr. J. Ramsbottom), 636  
 Fungi that are Difficult to Grow on Liquid Media : Estimation of the Antibacterial Activity of (W. H. Wilkins and G. C. M. Harris), 590  
 Fungi (Angiosperms and) : Genetical Control of Incompatibility in (Dr. K. Mather), 392  
 Fungi (Aquatic) : New Species of (Dr. C. F. Ingold), 717  
 Fungi (Higher Plants and) : Effect of *p*-Amino-Benzoic Acid on the Toxicity of *p*-Amino-Benzene Sulphonamide to (Dr. P. W. Brian), 83  
 Fungus, Bacterial and other Diseases of Crops in England and Wales for the Years 1933-1942 : Report on (Ministry of Agriculture and Fisheries Bulletin No. 126), review by Dr. John Grainger, 447  
 Fusarium Wilt of the Carnation (J. M. Bickerton), 58
- G**ALAXY : Partition of Energy among the Stars of the (—, Vysotsky and —, Williams), 114  
 Gametocytes from Extra-erythrocytic Forms in *Plasmodium gallinaceum* : Development of (Prof. S. Adler and I. Tchernomoretz), 83  
 Gamones from the Sperm of Sea Urchin and Salmon (Prof. John Runnström, Sven Lindvall and Prof. Arne Tiselius), 285 ; *erratum*, 649  
 Gas Gangrene due to *Clostridium oedematiens* : Bacteriological Diagnosis of (Dr. F. P. O. Nagler), 496  
 Gas Industry in Great Britain (Ministry of Fuel and Power committee of inquiry), 741  
 Gas-Tube Harmonic Generator (L. G. Kerota), 89  
 Gases (Flame) : Abnormal Dissociation in (Dr. A. S. Leah), 23  
 Gases : Poisonous, in the Exhaust of Diesel Engines (Dr. Enrique Castellano), 105  
 Genealogy of Human Folly (Prof. George Catlin), 61  
 Generating Plant : Performance of (R. W. Biles and G. W. Maxfield), 281  
 Genes : Eye, in *Drosophila melanogaster* (Dr. C. H. Waddington and R. W. Pilkington), 28  
 Leg, in *Drosophila melanogaster* (Dr. C. H. Waddington), 28  
 Genes and Development (H. Grüneberg), 28  
 Genes and the Man (Prof. Bentley Glass), review by Prof. J. B. S. Haldane, 234  
 Genetical Control of Incompatibility in Angiosperms and Fungi (Dr. K. Mather), 392  
 Genetics : Application of, to Plant and Animal Breeding (Genetical Society symposium on), 780  
 Deductive, review by Prof. J. B. S. Haldane, 234  
 Genetics of *Papaver alpinum* (A. C. Fabergé), 531  
 Genotypes of Different Strains of *Drosophila pseudo-obscura* (R. Lamy), 531  
 Geographical Method : Progress in (W. Fitzgerald), 481  
 Geological History of the Australasian Archipelago : Studies in the Systematics of *Troides* Hübner (Lepidoptera Papilionidae) and its Allies ; Distribution and Phylogeny in relation to the (Dr. F. E. Zeuner), 32  
 Geological Survey Work in the Colonies : A Review of (Imperial Institute), 582  
 Geological Surveys (Colonial) : Function and Future of (V. A. Eyles), 273 ; (Dr. J. D. Falconer), 409 ; (Imperial Institute), 582

- Geology : Introduction to, review by Prof. L. J. Wills, 445  
 Utilitarian Aspects of, review by Prof. P. G. H. Boswell, 756  
 Geology for Engineers (F. G. H. Blyth), review by Prof. O. T. Jones, 476  
 Geology for Everyman (the late Sir Albert Charles Seward), review by Prof. L. J. Wills, 445  
 Geology of Rhum (Dr. E. B. Bailey), 351 ; (S. I. Tomkeieff), 351  
 Geology in the Present War (J. C. Frye and C. P. Kaiser), 583  
 Geology in the Service of Man (Prof. W. G. Fearnside and Dr. O. M. B. Bulman), review by Prof. P. G. H. Boswell, 756  
 Geomagnetism : Solar Phenomena and, 452  
 Géométrie (Pensées) : Essais sur la (Prof. Thomas Greenwood), review by Prof. E. T. Whittaker, 268  
 Geometry (Pure Solid) : An Introduction to (Dr. G. S. Mahajani), second edition, review, 271  
 Geometry (Logic and) : An Aristotelian on, review by Prof. E. T. Whittaker, 268  
 Geophysical Effects : Solar Phenomena and some Allied (Royal Astronomical Society discussion on), 452  
 Geological Exploration in Canada and the United States, 503  
 Geophysics : Fifteen Years of, a Chapter in the Exploration of the United States and Canada, 1924-1939 (Rev. James B. Macelwane), 503  
 Geostatics (R. W. Holmes, S. H. Stelfox, S. J. Tomkeieff, Prof. W. Fisher Cassie and S. C. O'Grady), 716  
 German Chemical Industry : Control of, 519  
 German Physics Reader (J. E. Calthrop), review, 271  
 Germans in the U.S.S.R. : Action of the, 49  
 Gestation Periods, a Table and Bibliography (J. H. Kenneth), 162  
 Gesture Origin of Indo-European Languages (Prof. Alexander Jóhannesson), 171  
 Gibbs Medal of the Chicago Section of the American Chemical Society for 1944 awarded to Dr. George O. Curme, jun., 400  
 Gift of Tongues : The (Prof. Margaret Schlauch), review by Capt. T. H. Hawkins, 68  
 Glass (Optical) : New Types of (Dr. W. M. Hampton, R. E. Bastick and W. N. Wheat), 283 ; (W. G. Bent), 559  
 Gliotoxin : Production of, by *Aspergillus fumigatus* mut. *helvola* Yuill (G. A. Glistler and T. I. Williams), 651  
 X-Ray Crystallography of (Dr. D. Crowfoot and B. W. Rogers-Low), 651  
 Golgi Bodies : Effect of Colchicine on (C. L. Foster), 556  
 Golgi Element : The Nature of the (Prof. Vishva Nath), 553  
 Gooseberry, Indian (*Phyllanthus emblica*) : Vitamin C in (Dr. M. Srinivasan), 684  
 Gorgonorchynchus (Genus) : Nemertean Worm of the (Dr. F. J. G. Wheeler), 113  
 Gossypium : Meiosis of a Triple Species Hybrid in (S. G. Stephens), 82  
 Göttingen Medical School : British Medicine and the, 678  
 Government : Planning and the Machinery of, 231  
 Science and (Dr. H. G. Moulton), 18  
 Government Departments : Statistical Methods for, 88  
 Government Service : Scientific Men in, 18  
 Graphite Sols : Dehydrated (Bernard H. Porter), 161  
 Grass (Rye-) : Blind Seed Disease of (E. L. Calvert and A. E. Musket), 287  
 Grasses and Clovers (Forage) : Leaf Lipids of (F. B. Shorland), 168  
 Grassland Improvement (Dr. Maurice Copisarow), 256  
 Great Britain : Agricultural Education in, 190  
 Secondary Education in, 17  
 Electricity Supply in, 382  
 Gas Industry in (Ministry of Fuel and Power committee of inquiry), 741  
 Industrial Policy and Employment in, 355  
 Library Resources of, 206  
 Ophthalmology in (Dr. G. Lepage), 383  
 Refugees in (P. P. Broadsheet No. 216), 281  
 Science and Industry in (Lectures arranged by the Manchester Chamber of Commerce), 337, 371, 458, 520  
 Science and Research in, 519  
 Scientific Research in, 539  
 State Scientific Research in, 490  
 Scientific and Industrial Research in, 293  
 Trade Unions in, 553  
 A Search for Endemic Areas of Trichinosis in (E. L. Taylor), 745  
 University Development in, 471  
 Veterinary Education in (A. W. Whitehouse), 227  
 Water Resources of (H. U. Willink), 219  
 Water Supply in, 581  
 See also under Britain  
 Green Food : Influence of, on the Prevention of Piglet Anæmia (J. A. J. Venn), 591  
 Green Plants : Antibacterial Substances in (E. M. Osborn), 598  
 Greenland Plants (Dr. N. Polunin), 58  
 Greenwich : The Royal Observatory, to be moved to a new site, 175  
 Greenwich, 1936-40 : Variation of Latitude at (Sir Harold Spencer Jones), 319  
 Grey Mould (*Botrytis cinerea*) of Flax (Dr. John Colhoun), 25  
 Growth of the Adrenal Cortex in Mice : Trypan Blue and (Prof. M. K. McPhail), 460  
 Growth of Brown Trout : Nature of the Acid in Soft Water in relation to the (R. E. Sawyer), 55 ; (F. T. K. Pentelow), 464  
 Growth of Oat Roots : *p*-Aminobenzoic Acid and its Effect on the Sulphanilamide Inhibition of the (R. Forbes Jones), 379  
 Growth of Group C (Lancefield) Streptococci upon a Simplified Medium : Importance of Pyrimidine Derivatives in the (Dr. H. J. Rogers), 251  
 Growth Stimulation of *L. Casei* s by Pyrimidines (Dr. F. W. Chattaway), 250  
 Growth-factor to Rhizobium : A Thermolabile Accessory (Dr. H. K. Chen and M. K. Hsü), 21  
 Growth-Factors Required for the Nutrition of *Lactobacillus casei* s (Doris E. Dolby, Dr. Frank E. Happold and Dr. Mary Sandford), 619  
 Growth-Inhibiting Action of Some Pure Substances (A. K. Powell), 345  
 Guatemala : Archaeological Reconnaissance in (G. H. S. Bushnell), 61  
 Guinea Pigs : Behavioural Changes in Spayed Female, after Stilboestrol Administration (Dr. P. Bacsich and Dr. G. M. Wyburn), 346  
 Effect of Vitamin C on the Adrenaline Content of the Adrenal Glands of (Sachchidananda Banerjee), 526  
 Gut of Nebalia (Miss H. G. Q. Rowett), 318  
 Guthrie Lecture of the Physical Society (Prof. Joel H. Hildebrand), 492  
 Gypsies during the European War, 403  
 Gyro Flux Gate Compass System, 679  
 Gyroscopic Principles and Applications (Dr. Robert C. Gray), 277 ; (Prof. C. E. Inglis), 278  
 HAIR (Mammalian) : Morphology of (Dr. J. L. Stoves), 285  
 Halley Lecture (Prof. Herbert Dingle), 731, 758  
 Haloes : Ice-Crystal (D. B. O. Savile), 25 ; (Sidney Melmore), 166  
 Hamster (Striped) : Meiosis in the (G. Pontecorvo), 319 ; *erratum*, 373  
 Hannay (J. B.) and the Artificial Production of Diamonds (Sir James Weir French), 112  
 Hargreaves Scholarship tenable in the Mining Department of the University of Leeds, 649  
 Harmonic Analysis (Prof. L. M. Milne-Thomson), 536  
 Harmonic Generator : A Gas-Tube (L. G. Kerota), 89  
 Harris (South) : Archaean Gneisses of the Rodil District of (C. F. Davidson), 466  
 Harrowing (Disk-) versus Ploughing, review by Dr. R. K. Schofield, 391  
 Hawkesy Lecture to the Institution of Mechanical Engineers (Prof. C. E. Inglis), 278  
 Health : of France, 340  
 of Iceland, 162  
 in Industry, 50  
 Public, in Colombia (Dr. Eduardo Santos), 340  
 Public, in Costa Rica (Dr. Rafael A. Calderón Guardia), 617  
 Health and Hygiene (Lloyd Ackerman), review, 635  
 Healthier Women, a War-time Asset, 77  
 Hearing and Deafness : Measurement of (M. B. Gardner), 87  
 Research into Problems of, 522  
 Heart and Circulation : Effects of Carbon Dioxide on the (Dr. S. N. Mathur), 686  
 Heat : Treatment of Shock by (A. W. Kay), 291  
 Heat of Absorption : Boundary Lubrication and (J. J. Frewing), 718  
 Heating : Area (A. E. Margolis), 27 ; (Dr. L. E. C. Hughes), 27  
 Radio-Frequency (N. R. Bligh), 430  
 Ventilation and ; Lighting and Seeing (Industrial Health Research Board Pamphlet No. 1), 50  
 Heating Surfaces (Economizer) : Bonded Deposits on (J. R. Rylands and J. R. Jenkinson), 29  
 Helium II and Bose-Einstein Degeneracy (Liquid) : Surface Flow of (Prof. D. V. Gogate and R. N. Rai), 342  
 Helminthic Disease : Changed Viewpoints in (Dr. N. R. Stoll), 626  
 Helvolic Acid and Fumigacin : Identity of, 531  
 Herbs and Medicinal Plants, 707  
 Hessian Fly Resistance in Wheat (W. B. Noble), 465  
 Heterochromatin : Structure of (Dr. G. Pontecorvo), 365  
 Highlands of Scotland, Proposals for Development (Hugh Quigley), 552  
 High-Voltage Circuit-Breaker Technique (J. A. Harle and R. W. Wild), 627 ; (H. E. Cox and T. W. Wilcox), 627  
 Hip Fertility in Rosa Species : Ascorbic Acid and (Dr. Ake Gustafsson and Johan Schröderheim), 196 ; (Prof. J. W. Heslop Harrison and G. A. D. Jackson), 404 ; (Dr. Ronald Melville), 404  
 Histological Changes in the Pancreas : Relation of Scurvy to (Dr. Sachchidananda Banerjee), 344  
 History of Scientific Thought : An Unscientific, review by Sir Harold Spencer Jones, 67  
 Hole Theory of Liquids (F. C. Auluck and Prof. D. S. Kothari), 777  
 Holly Medal of the American Society of Mechanical Engineers awarded to Dr. Vannevar Bush, 282  
*Homo sapiens* in Australia contemporary with *Homo neanderthalensis* in Europe (Dr. F. E. Zeuner), 622  
 Honey : Factors in the Production of (E. B. Wedmore), 578  
 Honey and Pollen (Nectar) : Some Problems Associated with (John Pryce-Jones), 578  
 Honours : New Year, 48  
 King's Birthday, 739  
 Hormones : Vitamins and (edited by Prof. Robert S. Harris and Prof. Kenneth V. Thimann), Vol. 1, review by Dr. A. S. Parkes, 151  
 Hormones (Steroid) : Chemical Structure and Antifibromatogenic Activity of (Dr. Alexander Lipschütz), 260  
 Horticulture (Agriculture and) : A National Advisory Service for (H. W. Miles), 611  
 Hospital Treatment : A Film of, 77  
 Housing : Foundation for (Conservative and Unionist Party Organization Report), 725  
 Housing Problems : Scientific Approach to, 725  
 Human Blood Groups (Dr. J. F. Loutit), 97  
 Human Blood Plasma : Isinglass as a Substitute for, 247  
 Human Embryo, Nine to Ten Days Old (Prof. Francis Davies), 463  
 Human Embryos : Early (Prof. W. J. Hamilton and Prof. J. D. Boyd), 684 ; (Prof. Francis Davies), 684  
 Human Folly : Genealogy of (Prof. George Catlin), 61  
 Human Limits in Flight (Dr. Bryan H. C. Matthews), 698  
 Human Milk : Value of (Eric Wood), 584  
 Human Nutrition : Research in (Medical Research Council Unit for), 249  
 Human Sera : Rh Antibodies in (F. Stratton), 773  
 Human Serum : An 'Incomplete' Antibody in (Dr. R. R. Race), 771  
 Human Side of Anthropology (Dr. C. H. Waddington), 106  
 Hyaluronic Acid and Chondroitinsulphuric Acid : Molecular Shape and Size of (Prof. Gunnar Blix and Olle Snellman), 587  
 Hydracarina : Studies of (O. Lundblad), 113  
 Hydrides (Boron) : Structure of (H. C. Longuet-Higgins and R. P. Bell), 59  
 Hydrocarbons (Petroleum) : A System of Notation for (Dr. A. R. Richards), 715  
 Hydrogen Content of the Sun and of Stars of Small Masses (Prof. N. R. Sen and U. Burman), 166  
 Hydrogen Ion Concentration of the Muscle Fibre : Acid-labile Carbon Dioxide in Mammalian Muscle and the (Prof. E. J. Conway and P. J. Fearon), 54  
 Hydrogen Ions in High Concentration by Ordinary Baker's Yeast : Formation of (Prof. E. J. Conway and E. O'Malley), 652  
 Hydrogen and Oxygen by the Electrolysis of Water : The Production of (C. E. Bowen), 78  
 Hydrolysis in the Presence of 2,4-Dinitrophenylhydrazine : Slow Protein (Dudley F. Cheesman and Gösta C. H. Ehrensverd), 108



- Hygiene : Health and (Lloyd Ackerman), *review*, 635  
 School, in Peru, 741
- Hygiene of the Eighth Army in North Africa (Lieut.-Col. H. S. Gear), 683
- Hyoscyamine : Putrescine in the Biosynthesis of (B. T. Cromwell), 717
- Hypericum : The Colombian (Jose Cuatrecasas), 402
- Hypericum perforatum* (L.) : The Entomological Control of St. John's Wort (Frank Wilson), 785
- Hypomyces (Aquatic) : New Species of (Dr. C. F. Ingold), 717
- Hysterical Origin : Total Colour Blindness of (Dr. R. W. Pickford), 256
- I**CE-CRYSTAL Haloes (D. B. O. Savile), 25 ; (Sidney Meltmore), 166
- Iceland : Health of, 162
- Identification of Insects of Medical Importance : A Handbook for the (Dr. John Smart), *review* by Dr. A. D. Imms, 96
- Illusion of Personality (H. G. Wells), 395
- Immunization against Diphtheria : Duration of (H. Lyndhurst Duke and W. B. Stott), 318
- Immunizations in Large Cities of the United States (Selwyn D. Collins and Clara Council), 249
- Impedance Circle Diagram : Transmission-Line Problems and the (Willis Jackson and L. G. H. Huxley), 319
- Incompatibility in Angiosperms and Fungi : Genetical Control of (Dr. K. Mather), 392
- Incompatibility in Plants (Dr. D. Lewis), 258, 575
- India : Educational Reconstruction in (T. Raymont), 467 ; (John Sargent), 467  
 Food Production in (Ras Bahadur Dr. D. V. Bai), 750  
 Industrial Research, with special reference to (J. J. Ghandy), 624  
 Medical Education in (Dr. G. Lapage), 658  
 Medical Services for (Major-General J. B. Hancock), 646  
 Post-War Organization of Scientific Research in (Sir J. C. Ghosh), 429  
 Tent Caterpillar in (K. A. Rahman and A. N. Kalra), 113
- India and Burma, 1941-42 : Forest Research in, Part I, The Forest Research Institute, 201
- Indian Gooseberry (*Phyllanthus emblica*) : Vitamin C in (Dr. M. Srinivasan), 684
- Indian Myxosporidia : Researches in, 113
- Indian (West) Conference, 312
- Indies (West) : Compendium and Description of the (Antonio Vázquez de Espinosa), translated by Charles Upson Clark, *review* by Dr. J. N. L. Baker, 299
- Individual, Family, Population and Race (Prof. Franz Boas), 33
- Individuals (Families and) : Budgetary and Dietary Surveys of (Nutrition Society conference on), 306, 585
- Indo-European Languages : Gesture Origin of (Prof. Alexander Jóhannesson), 171  
 Origin of (Sir Richard A. S. Paget), 257, 381 ; (Alan S. C. Ross), 257
- Induction : Hr. Von Wright on the Logic of (Prof. C. D. Broad), 430
- Inductive Method : New Light on the, 430
- Industrial Diseases : Factory Medical Services and (London School of Hygiene and Tropical Medicine week-end course for medical practitioners), 312
- Industrial Fire Risks (W. Fordham Cooper and F. H. Mann), 248
- Industrial Poisons (Dr. Donald Hunter), 412
- Industrial Policy and Employment in Great Britain, 355
- Industrial Reconstruction : Post-War (Memorandum by the Internal Combustion Engine Manufacturers' Association), 76
- Industrial Research : Scientific (Report of the London Chamber of Commerce), 294  
 Scientific and, in Great Britain, 293
- Industrial Research, with special reference to India (J. J. Ghandy), 624
- Industrial Research in New England, 200
- Industrial Research and Taxation, 76
- Industry : Relation of Academic Training to (Dr. H. Erb), 561  
 Health in, 50  
 Trained Metallurgists in (Dr. W. T. Griffiths), 553  
 Minerals in (W. R. Jones), *review* by V. A. Eyles, 668  
 Research and (Lord Riverdale), 337  
 Application of Research in (Dr. Andrew McCance), 458  
 Research Workers in, 371  
 Science and (J. G. Bennett), 130  
 Science and, in Great Britain (Lectures arranged by the Manchester Chamber of Commerce), 337, 371, 458, 520  
 Scientific Personnel in, 3  
 X-Ray Analysis in (X-Ray Analysis Group of the Institute of Physics conference on), 51, 533
- Industry and Provision of Man-Power : Location of, 505
- Industry and Research (Report of the F.B.I. Industrial Research Committee), 3
- Industry (British) : Work, the Future of (Report of the Sub-Committee on Industry of the Conservative Central Committee on Post-War Problems), 355
- Inert Dusts on Insects : Action of (Dr. V. B. Wigglesworth), 493 ; (Dr. H. Kalmus), 714
- Infection : Air-Borne (Prof. Dwight O'Hara), *review*, 271  
 Infinite Series for Fifth Formers (N. M. Gibbins), 536
- Infra-Red Measurements in Chemistry : The Scope and Limitations of (Dr. H. W. Thompson), 79, 209
- Inheritance of a Mutation in Wheat Rust (T. Johnson and Margaret Newton), 319
- Injured (War) : Rehabilitation of the (edited by Dr. William Brown Doherty and Dr. Dagobert D. Runes), *review*, 329
- Injuries (Diseases and) : A Provisional Classification of, for Use in Compiling Morbidity Statistics (Medical Research Council, Special Report Series No. 248), 584
- Insect Pests : Biological Control as a Supplement to Chemical Control of (Dr. W. E. Ripper), 448
- Insects : Action of Inert Dusts on (Dr. V. B. Wigglesworth), 493 ; (Dr. H. Kalmus), 714
- Insects of Medical Importance : A Handbook for the Identification of (Dr. John Smart), *review* by Dr. A. D. Imms, 96
- Insects (Plants and) : Inter-relations of (British Ecological Society and the Royal Entomological Society discussion on), 424
- Instruments for the Automatic Controlling and Recording of Chemical and other Processes (Institution of Chemical Engineers and the Institute of Physics joint conference on), 617
- Insulating Materials (Some Modern) : The Control, Specialized Testing and Use of (A. R. Dunton), 79
- Intellectual Freedom : Vesalius and the Struggle for (Prof. Howard W. Haggard), 707
- Intelligence and Season of Conception (Dr. J. Fraser Roberts), 401
- Intensity within the Solar Corona : On the Distribution of (Dr. H. A. Brück), 452
- Interference Phenomena with Newton's Rings : New (Dr. S. Tolansky), 314
- Interferometric Procedure for the Examination of Crystal Surfaces (Prof. Manne Siegbahn), 435 ; (Dr. S. Tolansky), 435
- International Air Transport (Brig.-General Sir Osborne Mance and J. E. Wheeler), *review* by Capt. J. L. Pritchard, 417
- International Co-operation in Telecommunications, 557
- International Labour Organization as a Social Force, 415
- International Language : An, *review* by Dr. Maxwell Garnett, 205
- International Peace : Psychology of, *review* by Dr. R. W. Pickford, 123
- International Sphere : Trade and Economics in the, 411
- International Student Service : The Work of (Jam; L. Handerson), 152
- International Telecommunications (Brig.-General Sir Osborne Mance), 557
- Interstellar Calcium Clouds, 319
- Intestinal Cells : Free Border of (Dr. John R. Baker), 113
- Intracellular Localization of Vitamin C (Dr. Geoffrey H. Burne), 254
- Ionization and Chromosome Breakage (Dr. D. G. Catchside and D. E. Lea), 465
- Ireland : Small Ermine Moths in (Bryan P. Bsrine), 413
- Iris (*Iris germanica*) : Vitamin C in (Dr. Emil J. Baumann), 633
- Iron and Steel Industry : Research and the (Prof. F. C. Thompson), 291
- Ishihara Test for Colour Blindness (Dr. R. W. Pickford), 656
- Isinglass as a Substitute for Human Blood Plasma, 247
- Island Farm (Dr. F. Fraser Darling), *review* by Secon Gordon, 390
- Island Peoples of the Western Pacific, Micronesia and Melanesia (Herbert W. Krieger), 340
- Iso-Immunization (Maternal) : Levine's Hypothesis of (Prof. Lancelot Hogben), 222
- J**AUNDICE : Sulphur-containing Amino-Acids and (Prof. R. A. Peters, Dr. R. H. S. Thompson, Lieut.-Colonel A. J. King, Major D. I. Williams and Major C. S. Nicol), 773
- Jefferson and the Scientific Trends of his Time (Dr. Charles A. Browne), 584
- Jet-Propelled Fighter Aircraft, 74
- K** $\alpha$  SATELLITES on X-Ray Powder Photographs : Detection of the (Mme. Margaret C. M. Farquhar and Miss Adrienne R. Weill), 56
- Keith Prize of the Royal Society of Edinburgh for the period 1941-43 awarded to Prof. James Ritchie, 431
- Kenya : Archaeological Find in, 582
- Kew : Earthquakes registered at, 554  
 Earthquakes registered during September 11 to November 26, 163 ; during February 4-April 5, 649
- Kilimanjaro, an Active Volcano (Dr. P. E. Kent), 454
- Kilns (Timber-drying) : Observations on the Design of (Forest Products Research Laboratory, Leaflet No. 30), 339
- Kinetics : Reaction, in Solution (R. P. Bell), 718
- Krisson Bulletin, April, June and September, 1943, issues, 220
- L**ABORATORIES (Modern Industrial Chemical) : Design of (E. D. Mills), 459
- Laboratory Strains, 531
- Lachish, Palestine : The Wellcome-Marston Excavations at (Olga Tufnell), 545
- Lacquered Steel Surfaces : Filiform Underfilm Corrosion of (C. F. Sherman), 621
- Lactic Acid as an Aerial Bactericide : Vaporization of (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 743
- Lactobacillus casei* : Use of Casein Hydrolysate in Experiments on the Nutrition of (Dr. D. E. Dolby and J. W. Waters), 139
- Lactobacillus casei* s : Growth-Factors Required for the Nutrition of (Doris E. Dolby, Dr. Frank E. Hoppold and Dr. Mary Sanford), 619
- Growth Stimulation of, by Pyrimidines (Dr. F. W. Chattaway), 250
- Lamellibranchiata : Classification of (Daphne Atkins), 318
- Land (Poor) Arable Farming : The Economics of (Dr. S. M. Makings), *review*, 757
- Land Occupation in Denmark's Stone Age (Johs. Iverson), 511
- Landnam i Danmarks Stenalder (Johs. Iverson), 511
- Language : An International, *review* by Dr. Maxwell Garnett, 205  
 The Loom of (Frederick Bodmer), edited and arranged by Prof. Lancelot Hogben, *review* by Major J. Marshall, 729
- Language in the Making, *review* by Capt. T. H. Hawkins, 63
- Languages (Indo-European) : Gesture Origin of (Prof. Alexander Jóhannesson), 171  
 Origin of (Sir Richard Paget), 257, 381 ; (Alan S. C. Ross), 257
- Larvæ of the Lepidoptera associated with Stored Products (Dr. H. E. Hinton), 193
- Larval Development of *Leander squilla* (L.) forma typica de Man : On the Biology and (Dr. Hans Höglund), 751
- Latitude at Greenwich, 1936-40 : Variation of (Sir Harold Spencer Jones), 319
- Lattice Constant of Diamond and the C-C Single Bond (Dr. D. P. Riley), 587
- Lavoisier Statue in Paris, 311
- Law : The Statistical, in Nature (Prof. Erwin Schrödinger), 704
- Law Gold Medal of the Indian Association for the Cultivation of Science awarded to Sir Henry Dale, 679
- Laws of Nature : The (Prof. Herbert Dingle), 731, 758
- Leaf Development and Stelar Morphology in Species of *Dryopteris* : Experimental Observations on the Relation between (Prof. C. W. Wardlaw), 377
- Leaf Lipids of Forage Grasses and Clovers (F. B. Shorland), 169
- Leander squilla* (L.) forma typica de Man : On the Biology and Larval Development of (Dr. Hans Höglund), 751

- Learning in America (Science and) : The Early History of (Proceedings of the American Philosophical Society, Vol. 87, No. 1), review by T. Raymont, 207
- Leg Genes in *Drosophila melanogaster* (Dr. C. H. Waddington), 28
- Lenin, Order of : Conferred on Prof. Vladimir A. Obruchev, 75  
Awarded to Prof. Evgeni Pavlovsky, 400
- Lenses : Electrostatic Electron (K. Spangenberg and L. M. Field), 441
- Lepidoptera associated with Stored Products : The Larvæ of the (Dr. H. E. Hinton), 193
- Leprosy : Prominent Treatment of (G. H. Paget, R. C. Pogge, F. A. Johansen, J. F. Dinan, B. M. Prejean and C. G. Eccles), 465
- Leucocytes in Milk : Effect of Temperature on the Reducing Activity of (C. S. Morris), 436
- Levine's Hypothesis of Maternal Iso-Immunitization (Prof. Lancelot Hogben), 222
- Librarianship (Special) : Training in (Association of Special Libraries and Information Bureaux), 163
- Library Resources of Great Britain, 203
- Life in Milne's Cosmology (Origin of) : Radioactivity and the (Prof. J. B. S. Haldane), 555
- Life and Mentality of the Chimpanzee, review by Prof. S. Zuckerman, 65
- Light : Scattering of, by Small Particles (H. Zanstra), 466
- Light-Effect in Chlorine under Electrical Discharge ; Influence of the Gas Pressure (Prof. S. S. Joshi and P. G. Deo), 434
- Lighting Systems (Emergency) : Applications of (S. H. Chase), 79
- Lighting and Seeing : Ventilation and Heating ; (Industrial Health Research Board Pamphlet No. 1), 50
- Lilies (Seedling) : Disease of (Lillian E. Hawker and B. Singh), 466
- Limits in Flight : Human (Dr. Bryan H. C. Matthews), 693
- Linings (Adhesives and) : Plywood, 173
- Lipids : Leaf, of Forage Grasses and Clovers (F. B. Shorland), 169
- Liquid State : The (Prof. Joel H. Hildebrand), 492
- Liquids : Foam consisting solely of (Prof. Carl Benedicks and Per Sederholm), 80
- The Hole Theory of (F. C. Auluck and Prof. D. S. Kothari), 777
- Liquids and Solids and Dipole Moments : Relationship between Dielectric Constant of (S. K. Kulkarni Jatkari), 222
- Literary Vocabulary : The Statistical Study of (G. Udny Yule), review by M. G. Kendall, 570
- Liver Damage : Methionine in the Treatment of (Prof. J. Beattie and Major J. Marshall), 525
- Livestock : Improvement of (Prof. Robert Rae), 117
- Load Analysis : Electricity Supply System (P. Schiller), 430
- Locating Buried Cables Electrically (R. M. C. Greenidge), 173
- Loch (Sea) : A Fish-Farming Experiment in a (Dr. F. Gross and J. E. G. Raymont and Dr. S. M. Marshall and Dr. A. P. Orr), 483
- Logic : Formalization of (Prof. Rudolf Carnap), review, 8
- Logic of Induction : Hr. Von Wright on the (Prof. C. D. Broad), 430
- Logic and Geometry : An Aristotelian on, review by Prof. E. T. Whittaker, 268
- Logical Positivism : An Attack on, 191
- London Transport : Railway Signalling on (R. Dell), 648
- Lubrication : Boundary, and Heat of Absorption (J. J. Frewing), 718
- Lunar Eclipses and the Earth's Atmosphere (Daniel Barbier, Daniel Chalonge and Ernest Vigroux), 708
- Lung : Operation for the removal of the (Gaumont Instructional Films), 77
- Lyell Fund of the Geological Society awarded to Dr. S. Buchan, and to E. W. J. Moore, 134
- Lyell Medal of the Geological Society awarded to Dr. N. R. Junner, 134
- M**CNAIR Report on Teachers and Youth Leaders, 601, 629, 663
- Macropodus : Sodium Sulphate as an Agent Causing the Development of the 'Chloride-secreting Cells' in (C. K. Liu), 252
- 'Magnetic' Current (James T. Kendall), 157
- Magnetic Storms : Solar Flares and (H. W. Newton), 452, 532
- Magnetic Storms and Solar Activity (Dr. C. W. Allen), 452
- Maintenance Requirements : The Influence of, on the Design of Electrical Installation Equipment (H. Drake), 430
- Malaria in the South-West Pacific, 160
- Malaria (Anti-) Campaign in Panama, 78
- Malarial Parasite in the Vertebrate Host : Biology of the (Dr. D. G. Davey), 110
- Malonic Acid : Reactions of Amidines with derivatives of (G. W. Kenner, B. Lythgoe, A. R. Todd and A. Topham), 59
- Mammalian Hair : Morphology of (Dr. J. L. Stoves), 285
- Mammalian Reproduction, 162
- Man : Colour Sensation in, review by Prof. H. E. Roaf, 235
- Genes and the (Prof. Bentley Glass), review by Prof. J. B. S. Haldane, 234
- Geology in the Service of (Prof. W. G. Fearnsides and Dr. O. M. B. Bulman), review by Prof. P. G. H. Boswell, 756
- Metals in the Service of (Arthur Street and William Alexander), review by Dr. S. W. Smith, 634
- The Microbe (Eleanor Dothy), review, 668
- Parasitic Diseases of, in relation to the War (Dr. G. Lapage), 625
- Recognition of a Further Common Rh Genotype in (Dr. R. R. Race, Dr. G. L. Taylor, Prof. D. F. Cappel and Marjory N. McFarlane), 52
- The Universal Rights of (H. G. Wells), 220
- Man in Australia : The Antiquity of (Prof. F. Wood Jones), 211
- Man in the Crimea : Pre-Neanderthal (Sir Arthur Keith), 515
- Man and his Expanding Universe, 459
- Man, Real and Ideal (Prof. Edwin Grant Conklin), review by the Very Rev. W. R. Matthews, 38
- Man (Modern) (*Homo sapiens*) : Evolution of (Sir Arthur Keith), 742
- Man's Colour Sense : The Fundamental Colour Sensations in (Gastaf F. Göthlin), review by Prof. H. E. Roaf, 235
- Man's Influence on Seismic Movements, 219
- Man's Most Dangerous Myth—The Fallacy of Race (M. F. Ashley Montagu), review by Prof. H. J. Fleure, 604
- Manchester : Science and Industry at, 337, 371, 458, 520
- (*Mandrillus leucophaeus*) : An Undescribed Feature in the Drill (Prof. W. C. Osman Hill), 199
- Manganese in the Biological Synthesis of Ascorbic Acid : Role of (M. N. Rudra), 743
- Manganese Deficiency in Oats (C. S. Piper), 197 ; (E. S. Twyman), 198
- Manganese Hunger in Animals (M. N. Rudra), 111
- Man-Power : Location of Industry and Provision of, 505
- Manure Note Book (John Stewart Remington), review, 180
- Manuring of Black Cotton Soil : Nitrogenous (Dr. A. Sraenivasan), 55
- Manville Scholarship of the Institution of Electrical Engineers, 312
- Map Reading and Avigation (Richard M. Field and Harlan T. Stetson), review, 180
- 'Marfanil', 707
- Marrow (Bone) : Transfusion into the (Hamilton Bailey), 253
- Maternal Iso-Immunitization : Levine's Hypothesis of (Prof. Lancelot Hogben), 222
- Mathematical Geography : More (W. Hope Jones), 536
- Mathematical Physics, review by Prof. L. M. Milne-Thomson, 633
- Mathematical Recreations (Prof. Maurice Kraitchik), review, 271
- Mathematical Statistics (S. S. Wilks), review, 8
- Mathematical Syllabuses (School) : Reform of (Mathematical Association meeting on), 535
- Mathematical Tables : New, 311
- Mathematics : Apparatus used in the Teaching of (C. W. Hansel), 536
- Mathematics of Biological Assay (Eric C. Wood), 84, 681 ; (D. J. Finney), 284 ; (N. T. Gridgeman), 461
- Mathematics as a Cultural Subject (P. J. Wallis), 26
- Mathematics as a Compulsory Examination Subject (D. Brownlie), 281
- Mathematischen Physik : Methoden der (Prof. R. Courant and Prof. D. Hilbert), Band I, Zweite verbesserte Auflage, Band 2, review by Prof. L. M. Milne-Thomson, 633
- Matter : Cold Dense (Prof. E. A. Milne), 658 ; (Dr. D. S. Kothari), 658
- Matter under High Hydrostatic Pressure : Some Rheological Properties of (Dr. R. Dow), 78
- Maximum Effect : Application of the Principle of (Dr. Hugh Nicol), 623
- Maxwell : Significado fisico e historico de la teoria de (Mario Bunge), 77
- Maxwell's Theory : Physical Significance of, 77
- Mayer Prize of the U.S. National Academy of Sciences awarded to Dr. Alexander Lipschütz, 614
- Meal Moch : Water Contents of the Last-stage Larvæ, Pupæ and Adults of the (Dr. Ludwig Auber and J. E. G. Raymont), 314
- Measurements in Radio Experimental Work (Dr. R. L. Smith-Rose), 50
- Meat (Milk or) : The Breeding of Cattle for (Dr. John Hammond), 116
- Mechanical Properties of Rubber-like Materials : Effect of Temperature upon the (W. P. Fletcher), 341
- Mechanics : Statistical, of Fields and the 'Apeiron' (Prof. Max Born and H. W. Peng), 164
- Medical Bulletin, British, 311 ; Special issue (Vol. 2, No. 1) devoted to Penicillin, 312 ; For sale in the United Kingdom (British Council), 649
- Medical Books at the University of Edinburgh (Early) : Exhibition of, 647
- Medical Education in India (Dr. K. V. Krishnan), 658 ; (Dr. G. Lapage), 658
- Medical Nobel Institute in Sweden, 615
- Medical and Surgical Achievement in the U.S.S.R. during War (E. Rock Carling), 419
- Medical Science : Polish, 767
- Medical Services for India (Major-General J. B. Hance), 646
- Medicinal Plants : Herbs and, 707
- Medicine : British, and the Göttingen Medical School, 678
- (Physical) : Study of, 403
- Social, 443
- A Social, based on Social Statistics (Prof. P. Sargant Florence), 363
- Medicine and Education (Sir John Graham Kerr), 133
- Medicine and the War : Bacteriology, (N. P. Sherwood), 583
- Mediterranean Region : Plant Geography of the, review by Miss G. M. Roseveare, 445
- Megaloptera and Neuroptera (Aquatic) : Keys to the British Species of (D. E. Kimmins), 741
- Megaphytic Habit in the African Tree *Senecios* and other Genera (A. D. Cotton), 679
- Meiosis in the Striped Hamster (G. Pontecorvo), 319 ; *erratum*, 373
- Meiosis of a Triple Species Hybrid in *Gossypium* (S. G. Stephens), 82
- Melanesia (Western Pacific, Micronesia and) : Island Peoples of the (Herbert W. Krieger), 340
- Mental Relaxation in Peace and War : Muscular and (Dr. E. J. Boome), 547
- Mentality of the Chimpanzee : Life and, review by Prof. S. Zuckerman, 65
- Mercury : Solubility of Silver in (Dr. D. R. Hudson), 259
- Merseyside Fauna and Flora, 161
- Merton Catalogue of Chromosomes of British Plants : Supplement to the (J. P. Rutland), 249
- Meson Spectrum and the Rossi Second Maximum : Banded (S. V. Chandrasekhar Aiyar), 375
- Metabolism of Acetoacetic Acid (Dr. H. Weil-Malherbe), 435
- Metabolism of Fat (Dr. Ida Smedley-Maclean), review by Dr. A. Kleinzeller, 510
- Metabolite Preparation containing Living *Penicillium notatum* : A Standardized Antibacterial Pyrogen-free (Dr. H. E. Enoch and Dr. W. K. S. Wallerstein), 380
- Metallic Searchlight Mirrors (Lord Rayleigh), 112
- Metallurgists : The Training of, with special reference to the Iron and Steel Industries (Report of the Iron and Steel Institute), 753
- Metallurgists in Industry : Trained (Dr. W. T. Griffiths), 553
- Metallurgy in Everyday Terms, review by Dr. S. W. Smith, 634
- Metals : The Extrusion of (Claude E. Pearson), review by Prof. F. C. Thompson, 696
- Determination of Specific Heat of (H. W. Baxter), 316
- Thermal Fatigue of (W. Boas and R. W. K. Honeycombe), 494 ; *erratum*, 770
- Metals in the Service of Man (Arthur Street and William Alexander), review by Dr. S. W. Smith, 634
- Metals in the Stars (Sir Harold Spencer Jones), 163
- Meteorites and an Earth-Model (Prof. R. A. Daly), 718
- Methionine in the Treatment of Liver Damage (Prof. J. Beattie and Major J. Marshall), 525
- Methylene Blue Reduction by Dehydroascorbic Acid : Role of Phosphate in the (Dr. L. Frankenthal), 255
- Mexico : Earthquake on January 10, 708
- Mice : Trypan Blue and Growth of the Adrenal Cortex in (Prof. M. K. McPhail), 460
- Microanalysis of Organic Compounds (Ultimate) : A New Technique for the (R. Belcher and C. E. Spooner), 24

- Microbe Man : The (Eleanor Dooley), *review*, 668  
 Microbiological Assay of Riboflavin (Dr. Frank C. Happold, Dr. F. W. Chattaway and Dr. Mary Sandford), 225 ; (S. A. Price and H. C. H. Graves), 461  
 Microdensitometry and Microsensitometry (Royal Photographic Society symposium on), 241  
 Microfilm Reader : A New Form of (Dr. E. H. J. Schuster), 155  
 Micronesia and Melanesia (Western Pacific) : Island Peoples of the (Herbert W. Krieger), 340  
 Microphotography and Photomicrography, and other Terminological Inexactitudes (Editor of *Photographic Abstracts*), 218  
 Microphotometer : A New Type of (R. W. Pringle), 81  
 Microscopes : Petrological (A. Broughton Edge and Dr. A. F. Hallimond), 716  
 Microscopy : Electron (J. H. L. Watson), 466  
 Microsensitometry : Microdensitometry and (Royal Photographic Society symposium on), 241  
 'Microtimer' (R. K. Dundas, Ltd.), 599  
 Microwave Transmission (Prof. J. C. Slater), *review*, 124  
 Middle East Supply Centre : Value of the, 691  
 Mildew of the Rose : Powdery (Wilbur D. McCellan), 162  
 Military Service : Veterinary Surgeons and, 19  
 Milk : Effect of Temperature on the Reducing Activity of Leucocytes in (C. S. Morris), 436  
 Milk Business : This (Arthur Guy Enoch), *review* by Prof. H. D. Kay, 476  
 Milk (Human) : Value of (Eric Wood), 584  
 Milk (Sow's) : Fat of (P. B. D. de la Mare and F. B. Shorland), 380  
 Milk or Meat : The Breeding of Cattle for (Dr. John Hammond), 116  
 Milk Bottles : Cleansing of (Dr. G. Lapage), 31  
 Milne's Cosmology : Radioactivity and the Origin of Life in (Prof. J. B. S. Haldane), 555  
 Mind a Calculating Machine ? Is the, *review* by Winston H. F. Barnes, 605  
 Mineral Deficiencies in Fruit Trees (J. B. Duggan), 28 ; (D. W. Goodall), 28  
 Mineral Fragments (Rock and) : Cellulose Acetate Mounts for (Capt. A. T. J. Dollar), 226  
 Mineral Resources of Eire (Dr. W. Bishop), 532  
 Mineral Resources of Tanganyika (Sir Edmund Teale and F. Oates), 740  
 Minerals in Industry (W. R. Jones), *review* by V. A. Eyles, 668  
 Mines : Transmission and Distribution of Electricity in (B. L. Metcalf), 219  
 Mining Scholarships : Part-time Day Advanced (Miners' Welfare Commission), 492  
 Mirror for Americans (Prof. Ralph H. Brown), *review* by Squadron-Leader J. N. L. Baker, 695  
 Mirrors : Metallic Searchlight (Lord Rayleigh), 112  
 Missouri : Recent Archaeological Investigations in Platte and Clay Counties (Waldo R. Wedel), 322  
 Mittelmeerländer : Das Pflanzenkleid der (Prof. Dr. M. Rikli), *Lieferungen* 3-4, *review* by Miss G. M. Roseveare, 445  
 Molecular Co-ordination in Cellulose (Dr. F. T. Peirce), 586  
 Molecular Shape and Size of Hyaluronic Acid and Chondroitinsulphuric Acid (Prof. Gunnar Blix and Olle Snellman), 587  
 Molecular Weight of Egg Albumin (Herbert Gutfreund), 406  
 Molecules Occupying Several Sites : Number of Configurations of (Dr. E. A. Guggenheim), 255, 406  
 Molecules (Large) : The Chemistry of (edited by R. E. Burk and Oliver Grummitt), *review* by Dr. D. D. Pratt, 270  
 Molecules (Polyatomic) : Dipole Moments of (S. K. Kulkarni Jatkar), 316  
 Molluscan Shells : Occurrence of Strontium in (E. R. Trueman), 142  
 Monkeys (Apes and) : Pectoral Gland in (R. I. Pocock), 381  
 Monocotyledon Roots : Multiperforate Plates in Xylem Vessels of (B. C. Kundu), 58  
 Mookerjee Gold Medal for 1944 of the Indian Association for the Cultivation of Science awarded to Prof. A. V. Hill, 708  
 Moore, G. E. : The Philosophy of (edited by Paul Arthur Schilpp), *review* by H. P. Reichmann, 39  
 Morale : The Structure of (Dr. J. T. MacCurdy), *review* by Dr. Joseph Geoghegan, 66  
 Morbidity Statistics : A Provisional Classification of Diseases and Injuries for Use in Compiling (Medical Research Council, Special Report Series No. 248), 584  
 Morphology of Mammalian Hair (Dr. J. L. Stoves), 285  
 Morphology and Physiology for Medical Students : Elementary (Dr. J. H. Woodger), third edition, *review*, 697  
 Morrison Prizes of the New York Academy of Sciences awarded to W. A. Ritchie and to A. Grobman, 193  
 To be awarded in December, 770  
 Mortality : Canadian, in War Years, 282  
 Prenatal (Prof. F. W. Rogers Brambell and Ivor H. Mills), 558  
 Prenatal, and the Birth-Rate (Dr. A. S. Parkes), 245  
 Mosaic Disease and Fruiting of the Tomato (Ireson W. Selman), 531  
 Mosquitoes (Larvæ and Pupæ of) : Immediate Effect of X-Rays on the Movements of (G. Goldhaber and B. Feldman-Muhsam), 528  
 Moth (Meal) : Water Contents of the Last-stage Larvæ, Pupæ and Adults of the (Dr. Ludwig Auber and J. E. G. Raymont), 314  
 Mother and Son : The Rare Gene *Rhy* in (Dr. R. R. Race and Dr. G. L. Taylor), 560  
 Moths in Ireland : Small Ermine (Bryan P. Beirne), 413  
 Motility of Bull Spermatozoa : Acetate Utilization for Maintenance of (Henry A. Lardy and Dr. Paul H. Phillips), 168  
 Motors and Transformers : Economic Rating of (D. J. Bolton), 282  
 Moulds (Water) : Species of Phytophthora as (Elizabeth Blackwell), 496  
 Movimientos sísmicos : La Acción humana como una causa posible de liberar (Walter Knoche), 219  
 Multiperforate Plates in Xylem Vessels of Monocotyledon Roots (B. C. Kundu), 58  
 Murchison Fund of the Geological Society awarded to G. M. Stockley, 134  
 Murchison Medal of the Geological Society awarded to Prof. V. C. Illing, 134  
 Muscle and the Hydrogen Ion Concentration of the Muscle Fibre (Mammalian) : Acid-labile Carbon Dioxide in (Prof. E. J. Conway and P. J. Fearon), 54  
 Muscle (Unstriated) : Viscosity and Contraction of (Major Inderjit Singh), 591  
 Muscle Fibre : Acid-labile Carbon Dioxide in Mammalian Muscle and the Hydrogen Ion Concentration of the (Prof. E. J. Conway and P. J. Fearon), 54  
 Muscle Fibres (Isolated Cross Striated) : Adenosine-triphosphate Initiating Contraction and Changing Bi-refringence in (Dr. Fritz Buchthal, Adam Deusch and G. K. Nappes), 774  
 Muscular and Mental Relaxation in Peace and War (Dr. E. J. Boome), 547  
 Music : The Physics of (Dr. Alexander Wood), *review* by Sir James Jeans, 357  
 Mutability : Effect of Factors Influencing (Dr. S. Zamenhof), 169  
 Mutation in Wheat Rust : Inheritance of a (T. Johnson and Margaret Newton), 319  
 Mutation and the Rhesus Reaction (Prof. J. B. S. Haldane), 106 ; (Prof. R. A. Fisher, Dr. R. R. Race and Dr. G. L. Taylor), 106  
 Mutations in Bacteria (G. Luria and M. Delbruck), 717  
 Myxosporidia from the Common Food Fishes of Bengal : Studies on (M. Chakravarty), 113  
 Myth : Man's Most Dangerous—The Fallacy of Race (M. F. Ashley Montagu), *review* by Prof. H. J. Fleure, 604
- N**APHTHACENE Molecules in Solid Solution of Anthracene with the Variation of Wavelengths : Fluorescence Spectra of (S. C. Ganguly), 652 ; (E. J. Bowen), 653  
 'Nasturtium' (*Tropaeolum majus*) : Vitamin C in (Maurice D. Sutherland), 683  
 National Advisory Service for Agriculture and Horticulture (H. W. Miles), 611  
 National Flour and Bread : Fourth Report on (Scientific Adviser's Division of the Ministry of Food), 154  
 National State : The Crisis of the (Dr. W. Friedmann), *review* by Prof. George Catlin, 359  
 National Water Policy : A (White Paper on), 581  
 Natural History : Oddities of (Eric Parker), *review*, 8  
 Natural History and Chemistry of Drugs (Sir Henry Dale), 103  
 Natural History Societies : Directory of (Amateur Entomologists' Society), 161  
 Natural Philosophy : Fundamental Concepts of (Prof. E. A. Milne), 304 ; (Prof. Herbert Dingle), 304  
 Nature : The Laws of (Prof. Herbert Dingle), 731, 758  
 The Statistical Law in (Prof. Erwin Schrödinger), 704  
 Nature Conservation and Ecology, 568  
 Nature Conservation and Nature Reserves (Report of the British Ecological Society), 568  
 Nature Reserve : Devastation by the Germans at Askanya Nova, 75  
 Nature Reserves : Nature Conservation and (Report of the British Ecological Society), 568  
 Navigators : Portuguese (Arthur J. Hughes), 105  
 Neanderthal (Pre-) Man in the Crimea (Sir Arthur Keith), 515  
 Nebulæ : Gut of (Miss H. G. Q. Rowett), 318  
 Nebulæ (Spiral) : Direction of Rotation in (Edwin Hubble), 259 ; (Lindblad and Ohman), 259  
 Nectar, Honey and Pollen : Some Problems Associated with (John Pryce-Jones), 578  
 Neill Prize of the Royal Society of Edinburgh for the period 1941-43 awarded to Dr. Douglas A. Allan, 431  
 Nemertean Worm of the Genus *Gorgonorhynchus* (Dr. F. J. G. Wheeler), 113  
 Neolithic Forest Clearance (Dr. H. Godwin), 511  
 Nerve Fibres : Contraction, Turgor and the Cytoskeleton of (J. Z. Young), 333  
 Nerve Injuries (Peripheral) : Treatment of (Prof. H. J. Seddon), 78  
 Neuroptera (Aquatic Megaloptera and) : Keys to the British Species of (D. E. Kimmins), 741  
 New England : Industrial Research in, 200  
 New Guinea (east of) : Earthquake on December 23, 554  
 New World Prehistory : Cross Sections of, a Brief Report on the Work of the Institute of Andean Research, 1941-42 (Prof. Wm. Duncan Strong), 708  
 New Zealand : Earthquakes registered during September, 163 ; during November, 402 ; during December, 431  
 Contrasting Regional Morphology of Soil Erosion in (K. B. Cumberland), 492  
 Newton's Rings : New Interference Phenomena with (Dr. S. Tolansky), 314  
 Newton's "Principia" for the U.S.S.R., 75  
 Newton's Verses (Prof. E. N. da C. Andrade), 105  
 Newton's Work on Scientific Thought : Influence of (N. Teich), 42  
 Nichols Medal for 1944 of the New York Section of the American Chemical Society awarded to Prof. C. S. Marvel, 135, 583  
 Nile Basin : Rainfall in the (H. E. Hurst and R. P. Black), 616  
 Nitrogen : Disintegration of, by Fast Neutrons (P. Comparat), 720  
 Dissociation Energy of (Dr. A. G. Gaydon), 407  
 Nitrogen (Molecular) : Singlet Terms in the Spectrum of (Dr. A. G. Gaydon and Dr. R. E. Worley), 747  
 Nitrogen Loss from Soils and Oxide Surfaces (Prof. N. R. Dhar and Dr. N. N. Pant), 115  
 Nitrogen Peroxide Molecule : Structure of the (H. C. Longuet-Higgins), 408 ; *erratum*, 459  
 Nitrogen-fixing Property of *Rhizobium trifolii* : Variation in the (J. M. Vincent), 496  
 Nitrogenous Manuring of Black Cotton Soil (Dr. A. Sreenivasan), 55  
 Nobel Institute in Sweden : A Medical, 615  
 Noise Measurement in Vacuum Tubes (J. J. DeBuske), 114  
 Non-ionizing Radiations (Medical Research Council Committee on), 219  
 Non-linear Optics and Electrodynamics (Prof. E. Schrödinger), 532 ; (J. McConnell), 532 ; (W. Heitler and H. W. Peng), 532  
 North-East : Considerations Affecting Post-War Employment in the (Northern Industrial Group), 505  
 Notation for Petroleum Hydrocarbons : A System of (Dr. A. R. Richards), 715  
 Nuclear Disintegrations Produced by Cosmic Rays (M. Goldhaber), 221  
 Nuclear Energy-Levels (Dr. F. C. Champion), 720  
 Nucleic Acid in the Cell : Distribution of (H. N. Barber and H. G. Callan), 109  
 Nucleic Acid in the Dividing Cell : Structure of (Prof. J. Masson Gulland, G. R. Barker and D. O. Jordan), 20

- Nucleic Acids: 'Chromosomin' and (Torbjörn Caspersson), 499; (Dr. Edgar and Mrs. Ellen Stedman), 500  
 Distribution of (Prof. A. W. Pollister and Dr. A. E. Mirsky), 711  
 Terminology of (Prof. J. Masson Gulland, G. R. Barker and D. O. Jordan), 194
- Nucleoli and related Nuclear Structures (Prof. R. Ruggles Gates), 698  
 Nucleolus: The (Dr. F. M. L. Sheffield), 687  
 Nutrition of *Lactobacillus casei*: Use of Casein Hydrolysate in Experiments on the (Dr. D. E. Dolby and J. W. Waters), 139  
 Nutrition of *Lactobacillus casei* a: Growth-Factors Required for the (Doris E. Dolby, Dr. Frank E. Happold and Dr. Mary Sandford), 619  
 Nutrition (Human): Research in (Medical Research Council Unit for), 24  
 Nutrition Problems in Venezuela, 553  
 Nutritional Encephalomalacia in Chicks: Dried Potato Products and (R. H. Common and W. Bolton), 744
- OAK** Tree (Alexander L. Howard), 438  
 Oak Trees: *p*-Aminobenzoic Acid and its Effect on the Sulphanilamide Inhibition of the Growth of (R. Forbes Jones), 379  
 Oats: Manganese Deficiency in (C. S. Piper), 197; (E. S. Twyman), 198  
 Objects (Small): Colour of (E. N. Willmer), 774  
 Ocean: The Floor of the (Prof. Reginald Aldworth Daly), review by Prof. Arthur Holmes, 389  
 Oddities of Natural History (Eric Parker), review, 8  
 Estrone: *p*-Cresol and in Urine (N. R. Campbell and Dr. D. H. Hey), 745  
 Office Organization and Practice (British Standards Institution), 769  
 Official Statistics: Memorandum on (Royal Statistical Society), 88  
 Oil from the Sunflower Plants (E. F. Hurst), 248  
 Oil Seed Crop: Sunflowers as an, 401  
 Onion Leaves: Botrytis spp. on (C. J. Hickman and D. Ashworth), 466  
 Onocleoid Ferns: Bud Regeneration at Cut Parenchymatous Surfaces in (Prof. C. W. Wardlaw), 588  
 Onslow Prize awarded to Dr. A. B. Beakbane by the Council of Newnham College, Cambridge, 163
- 70 Ophiuchi (Systems 61 Cygni) and: Probable Physical Characteristics of the Quasi-Planets recently found in the (Prof. H. N. Russell), 59  
 Ophthalmology in Great Britain (Dr. G. Lapege), 383  
 Ophthalmology (English): History of (R. R. James), 384  
 Optical Glass: New Types of (Dr. W. M. Hampton, R. E. Bastick and W. N. Wheat), 283; New Types of (W. G. Bent), 559  
 Optical Workshop Principles (Col. Charles D'Avé), translated by Thomas L. Tippell, review by Dr. W. D. Wright, 544  
 Optician: The Art of the, review by Dr. W. D. Wright, 544  
 Optics and Electrodynamics: Non-linear (Prof. E. Schrödinger), 532; (J. McConnell), 532; (W. Heitler and H. W. Peng), 532  
 Orchard Spraying for Commercial Growers (J. Turnbull), 51  
 Oregon Coast and other parts of the North Pacific: Contribution to the Biology of the Albacore (*Germo alalunga*) of the (Vernon E. Brock), 717  
 Organic Compounds: Dictionary of (edited by Prof. I. M. Heilbron and H. M. Bunbury), Vol. 2: Ecaine—Myrrillin Chloride, Vol. 3: Naphthacarbazole—Zygadenine, review, 668  
 A New Technique for the Ultimate Microanalysis of (R. Belcher and C. E. Spooner), 24  
 Organization: Regional, in Australasia, 592  
 Osmium: Radioactivity in (Miss E. T. Lougher and Dr. S. Rowlands), 374  
 Osmotic Balance (Ingvar Jullander and Prof. The Svedberg), 523  
 Overhead Lines: Conductor Sagging on (C. O. Boyse and N. G. Simpson), 192  
 Copper Conductors for (G. W. Preston and H. G. Taylor), 616  
 Ovation in Farm Animals: Control of (John Hammond, jun.), 702  
 Ox Blood for Blood Transfusion (Dr. G. Lapege), 145  
 Oxide Surfaces (Soils and): Nitrogen Loss from (Prof. N. R. Dhar and Dr. N. N. Pant), 115  
 Oxygen by the Electrolysis of Water (Hydrogen and): The Production of (C. E. Bowen), 78
- PACHYCEPHALOSAURUS grangeri** (Barnum Brown and E. M. Schlackjer), 465  
 Pacific (Islands of the): Emergency Food Plants and Poisonous Plants of the (Dr. E. D. Merrill), 19  
 Pacific (Oregon Coast and other parts of the North): Contribution to the Biology of the Albacore (*Germo alalunga*) of the (Vernon E. Brock), 717  
 Pacific (South-West): Malaria in the, 160  
 Pacific (Western): Tuberculosis Survey in the, 193  
 Pacific (Western), Micronesia and Melanesia: Island Peoples of the (Herbert W. Krieger), 340  
 Pacific Ocean (north of Vita Levu Island): Earthquake on October 21, 163  
 Page Prize for 1943 of the Institution of Electrical Engineers awarded to J. V. Beaumont, 312  
 Palaeontology without Fossils in the 'Bird-Wing' Butterflies (Dr. A. Steven Corbet), 32  
 Palestine: The Wellcome-Marston Excavations at Lachish (Olga Tufnell), 545  
 Panama: Anti-Malaria Campaign in, 78  
 Pancreas: Relation of Scurvy to Histological Changes in the (Dr. Sachchidananda Banerjee), 344  
*Papaver alpinum*: Genetics of (A. C. Fabergé), 531  
 Paraguay: Tuberculosis in (Dr. A. R. Ginés, Dr. A. Alvarez and Dr. M. Mercado), 248  
 Parasitic Diseases of Man in relation to the War (Dr. G. Lapege), 625  
 Parasitoses in Bolivia: Chronic (Dr. Felix Veinyemillas), 51  
 Paris: Lavoisier Statue in, 311  
 Partnership in Colonial Development: Progress to, 691  
 Pascal's Arithmometer and Other Means to Solve Mathematical Problems (R. Nilsson), 247  
 Passerines: Behaviour of the Song Sparrow and other (Mrs. M. M. Nice), 144  
 Pasteurisation (Harry Hill), review, 272  
 Patent Law Reform, 553  
 Patent Law and Procedure in Austria (Dr. Paul Abel), 716  
 Patterson Diagrams: Interpretation of (Prof. G. Hägg), 81
- Peace (International): Psychology of, review by Dr. R. W. Pickford, 123  
 Peace and War: Muscular and Mental Relaxation in (Dr. E. J. Boome), 547  
 Peckham Experiment (Dr. Innes H. Pearce and Lucy H. Crocker), review by Dr. M. L. Johnson, 269  
 Pectoral Gland in Apes and Monkeys (R. J. Pocock), 391  
 Pedler Lecture of the Chemical Society (Dr. C. R. Harrington), 312  
 Pelagic Foraminifer: Biology, Ecology and Morphogenesis of a (Dr. Earl H. Myers), 322  
 Penetrating Showers: Radiation Producing (Dr. L. Jánossy and Dr. G. D. Rochester), 259  
 Penicillin: Clinical Use of, 521  
 Special issue of the *British Medical Bulletin* devoted to, 312  
 Penicillin, its Development for Medical Uses (Prof. H. W. Florey), 40  
 Penicillin in Treating War Wounds: The Use of (Medical Research Council War Memorandum No. 12), 767  
 Penicillin Dressings (L. D. Galloway and A. J. Hobson), 170  
*Penicillium notatum* (Living): A Standardized Antibacterial Pyrogen-free Metabolic Preparation containing (Dr. H. E. Enoch and Dr. W. K. S. Wallersteiner), 380  
 Peptones: Nature of (P. I. Fodor and S. Kuk-Meiri), 250  
 Peridinales: Studies in the Morphology, Taxonomy and Ecology of the (Herbert W. Graham), 661  
 Periodical Articles (Current): Streamlining Production and Distribution of (Zelietette Troy), 134  
 Periodicals: British Union Catalogue of, to be published by the Association of Special Libraries and Information Bureaux, 490  
 The Subject Index to, 1942 (Library Association), review, 635  
 Peripheral Nerve Injuries: Treatment of (Prof. H. J. Seddon), 78  
 Perseveration: Physique and (Henryk Misiak and Dr. R. W. Pickford), 622  
 Personality: The Illusion of (H. G. Wells), 395  
 Personnel: Scientific, in Industry, 3  
 Scientific, in the Aircraft Industry, 49  
 Peru: School Hygiene in, 741  
 (southern): Earthquake on February 29, 649  
 Pests (Insect): Biological Control as a Supplement to Chemical Control of (Dr. W. E. Ripper), 448  
 Peten (Campeche, Quintana Roo, and): Archaeological Reconnaissance in (Karl Ruppert and John H. Denison, Jr.), 61  
 Petersen Coils: A Modern Earth-Fault Relay Equipment for use on Systems Protected by (L. B. S. Golds and C. L. Lipman), 469  
 Petroleum—Past, Present and Future (Dr. Per K. Frolich), 565  
 Petroleum Hydrocarbons: A System of Notation for (Dr. A. R. Richards), 715  
 Petroleum Refining as a Chemical Industry (Dr. F. Kind), 660  
 Petroleum Technology: University of Birmingham to award Anglo-American studentships in, 770  
 Petrological Microscopes (A. Broughton Edge and Dr. A. F. Hallimond), 716  
 Petrology (Sedimentary): Statistics in (Dr. P. Allen), 71  
 Petunia: Specific Differences in (Dr. K. Mather), 661; (A. J. Bateman), 661; (Dr. K. Mather and P. M. J. Edwards), 661  
 Pflanzenkleid der Mittelmeerländer (Prof. Dr. M. Rikli), Lieferungen 3-4, review by Miss G. M. Rosevear, 445  
 Pharmaceutical Scholarships for Chinese Students, 459  
 Pharmacy: Future of, 103  
 Phenylenic Evidence for the Amphidiploid Origin of New World Cottons (S. G. Stephens), 53  
*para*-Phenol Sulphonic Acid: Thermodynamic Second Dissociation Constant  $K_2$  of (R. G. Bates, G. L. Siegel and S. F. Acree), 532  
 Phenolic Ethers: Dealkylation of (Dr. Fawzy Ghali Baddar), 377  
*para*-Phenolsulphonate as a Buffer: Potassium (E. E. Sager, M. R. Schooley and S. F. Acree), 532  
 Philippine Seas: Fishes from the (Henry W. Fowler), 135  
 Philosophy: Twentieth Century (edited by Dr. Dagobert D. Runes), review by T. Raymond, 207  
 Philosophy of Economics, review by M. H. Dobb, 236  
 Philosophy of Freedom, review by F. Ian G. Rawlins, 150  
 Philosophy of G. E. Moore (edited by Paul Arthur Schilpp), review by H. P. Reichmann, 39  
 Phloroglucine Dihydrate: Secondary Non-Lae Reflexions from (Prof. K. Banerjee and C. R. Bose), 23  
 Phosphate in the Methylene Blue Reduction by Dehydroascorbic Acid: Role of (Dr. L. Frankenthal), 255  
 Phosphoric Oxide: Forms of (W. L. Hill, G. T. Faust and S. B. Hendricks), 29  
 Phosphorus and Sodium (Active):  $\beta$ -Radiation from (Kai Siegbahn), 221  
 Photocells (Selenium Rectifier): Fatigue in (J. S. Preston), 680  
 Photographic Photometry, 241  
 Photographic Process: The Theory of the (Dr. C. E. Kenneth Mees), review by Prof. N. F. Mott, 632  
 Photographic Terminology, 218  
 Photographs: Divergopic, 458  
 Photography: Stereoscopic, 458  
 Photography as a Tool in Agricultural Research (Association for Scientific Photography discussion on), 719  
 Photometry: Photographic, 241  
 Photometry of Stars: Multi-Colour (J. Stebbins and A. E. Whitford), 29  
 Photomicrography: A Simple Technique for (Dr. W. N. Leak), 563; (J. Leonard Bowen), 685  
 Microphotography and other Terminological Inexactitudes; (Editor of *Photographic Abstracts*), 218  
 Photoperiodism in the Potato (C. M. Driver and J. G. Hawkes), 318  
 Physical Field Theories: The Affine Connexion in (Prof. E. Schrödinger), 572  
 Physical Medicine: Study of, 403  
 Physical Significance of Maxwell's Theory, 77  
 Physico-Chemical Methods (Prof. Joseph Reilly and Prof. William Norman Rae), fourth edition, Vol. 1, review by Prof. H. W. Melville, 696  
 Physico-Chemical Nature of Bacteriolysis (W. A. Dorfman), 169  
 Physico-Chemical Properties of the Surface of Growing Plant Cells (Prof. H. Lundegårdh and G. Stenlid), 618  
 Physics: Mathematical, review by Prof. L. M. Milne-Thomson, 633  
 Physics of Music (Dr. Alexander Wood), review by Sir James Jeans, 357  
 Physics in the War Effort: The Place of (J. H. McMillan), 583  
 Physics Reader: A German (J. E. Calthrop), review, 271  
 Physik: Methoden der mathematischen (Prof. R. Courant und Prof. D. Hilbert), Band I, Zweite verbesserte Auflage, Band 2, review by Prof. L. M. Milne-Thomson, 633

- Physiological Interpretation of Modern Flowering: Towards a (Prof. J. McLean Thompson), 163
- Physiology: Fluorescence as an Aid to (Dr. D. R. Peacock), 136
- Physiology for Medical Students: Elementary Morphology and (Dr. J. H. Woodger), third edition, review, 697
- Physiology of Incompatibility in Plants (Dr. D. Lewis), 258
- Physique and Perseverance (Henryk Misiak and Dr. R. W. Pickford), 622
- Phytase in Different Cereals and its Resistance to Dry Heat: Activity of the (Dr. R. A. McCance and Dr. E. M. Widdowson), 650
- Phytophthora as Water Moulds: Species of (Elizabeth Blackwell), 496
- Pigeons: Scraggly and Ataxic (O. Riddle and N. F. Hollander), 58
- Piglet Anæmia: Influence of Green Food on the Prevention of (J. A. J. Venn), 591
- Pigs: Congenital Porphyria in (N. T. Clare and E. H. Stephens), 252
- Pilots: Cloud Reading for (A. C. Douglas), review, 96
- Pisiform Bone (Prof. H. A. Harris), 715
- Pituitary Extracts and Water (Posterior): Induction of Sleep by Simultaneous Administration of (Dr. F. Schütz), 432
- Planetaria of the World (Roy K. Marshall), 191, 616
- Planetary Systems: Non-Solar (Prof. A. C. Banerji), 779
- Planets: Origin of the (R. A. Lyttleton), 592
- Planning: Judgment on, review by R. Brightman, 508
- Regional (L. B. Escritt), review by Prof. A. E. Trueman, 7
- Planning and the Machinery of Government, 231
- Planning and Research in the United States: Regional, 200
- Plant Breeding: New Methods in, 28
- Plant Cells (Growing): Physico-Chemical Properties of the Surface of (Prof. H. Lundegårdh and G. Stenlid), 618
- Plant Disease: A Survey of, review by Dr. John Grainger, 447
- Plant Diseases: New, 466
- Plant Distribution: Continental Drift and (Prof. D. H. Campbell), 717
- Plant Geography of the Mediterranean Region, review by Miss G. M. Roseveare, 445
- Plant Tissue Culture: A Handbook of (Dr. Philip R. White), review by Dr. R. D. Preston, 328
- Plant and Animal Breeding: Application of Genetics to (Genetical Society symposium on), 780
- Plants: Vitamin C in—'Nasturtium' (*Tropaeolum majus*) (Maurice D. Sutherland), 683; Iris (*Iris germanica*) (Dr. Emil J. Baumann), 683; Indian Gooseberry (*Phyllanthus emblica*) (Dr. M. Srinivasan), 684
- British Supplement to the Merton Catalogue of Chromosomes of (J. P. Rutland), 249
- Economic Crop, Improvement of, 499
- Green, Antibacterial Substances in (E. M. Osborn), 598
- Greenland (Dr. N. Polunin), 58
- Incompatibility in (Dr. D. Lewis), 258, 575
- Medicinal, Herbs and, 707
- Plants of the Islands of the Pacific: Emergency Food Plants and Poisonous (Dr. E. D. Merrill), 19
- Plants and Fungi (Higher): Effect of *p*-Amino-Benzoic Acid on the Toxicity of *p*-Amino-Benzene-Sulphonamide to (Dr. P. W. Brian), 83
- Plants and Insects: Inter-relations of (British Ecological Society and the Royal Entomological Society discussion on), 424
- Plasma Cholinesterase in Male and Female Rats (Dorothy B. Mundell), 557
- Plasmodium gallinaceum*: Development of Gametocytes from Extracythrocytic Forms in (Prof. S. Adler and I. Tchernomoretz), 83
- A Method of Collecting Sporozoites of, by Feeding Infected *Aedes aegypti* through Animal Membranes (Dr. Ann Bishop and Barbara M. Gilchrist), 713
- Plastics in the Radio Industry (E. G. Couzens and Dr. W. G. Wearmouth), review, 418
- Plastics and Electrical Technology (Plastics Group of the Society of Chemical Industry and the Institution of Electrical Engineers discussion on), 641
- Plowman's Folly (Edward H. Faulkner), review by Dr. R. K. Schofield, 391
- Plücker's Plane: The So-called (A. L. Parson), 112
- Plumage of Sea-Birds: White (Dr. K. J. W. Craik), 288, 527; (Sir John Graham Kerr), 347; (Dr. M. H. Pirene and Dr. A. C. Crombie), 526; (Edward A. Armstrong), 527; (D. S. Falconer), 777
- Plywood Adhesives: Preliminary Note on the Use of Sunn Hemp Seed Proteins as (Dr. D. Narayanamurti, V. Ranganathan and D. C. Roy), 173
- Plywood Adhesives and Linings, 173
- Plywood Containers: Interim Note on Inner Coatings for (Wood Preservation Section of the Forest Research Institute), 173
- Pneumococcal Types: Transformation of (Dr. W. T. J. Morgan), 763
- Poisonous Gases in the Exhaust of Diesel Engines (Dr. Enrique Castellano), 105
- Poisonous Reptiles of the World (Doris M. Cochran), 135
- Poisons: Industrial (Dr. Donald Hunter), 412
- Polar Diagrams of Radio Antennæ: Determination of (H. Paul Williams), 50
- Polarization in Fraunhofer Lines at the Sun's Limb (R. O. Redman), 718
- Polarizations in Extremely Dilute Solutions: Electric (R. Davis, H. S. Bridge and W. J. Svirbely), 258
- Polarographic Determinations: Base Electrolytes for use in (H. Wolfson), 375
- 'Polaroid Vectographs', 458
- Poliomyelitis in Chile, 459
- Polish Science and Learning: Medical issue of, 767
- Pollen and Artificial Wind Pollination: Collection of (D. Lewis and L. F. La Cour), 167
- Pollen (Nectar, Honey and): Some Problems Associated with (John Pryce-Jones), 578
- Pollination (Artificial Wind): Collection of Pollen and (D. Lewis and L. F. La Cour), 167
- Polymers: High (Raymond M. Fooss, J. Abere, W. O. Baker, Henry Eyring, John D. Ferry, Paul J. Flory, C. S. Fuller, G. Goldfinger, R. A. Harman, Maurice L. Huggins, H. M. Hulbert, H. Mark, H. Naidus, Charles C. Price, John Rehner, Jr., Robert Simha and A. V. Tobolsky), review, 665
- Polymers (Amorphous): Electron Diffraction of (G. D. Coumoulos), 259
- Polysaccharides: Structure, Function and Synthesis of (Prof. W. N. Haworth), 785
- Polyzoa (Bryozoa), I, Scrupocellariidae, Epistomiidae, Farciminariidae, Bicellariellidae, Aeteidae, Scrupariidae (Anna B. Hastings), 351; erratum, 431
- Population: Royal Commission on, 310, 387
- Population in Europe: The Displacement of (Prof. E. M. Kulischer), 148
- Population Change for Post-War Europe: Some Implications of (F. W. Notestein), 33
- Population Dynamics and Adaptive Evolution of Animals (S. A. Sewertzoff), review by Dr. B. P. Uvarov, 66
- Population and Race: Individual, Family, (Prof. Franz Boas), 33
- Populations (Animal): Fluctuations in, review by Dr. B. P. Uvarov, 66
- Porosity of Egg-Shells: Fluctuations in the (D. J. G. Black and Dr. Cyril Tyler), 682
- Porphyria in Pigs: Congenital (N. T. Clare and E. H. Stephens), 252
- Portuguese Navigators (Arthur J. Hughes), 105
- Positivism (Logical): An Attack on, 191
- Post-Graduate Lectures (Inorganic Chemistry, by Prof. H. J. Emeléus; Organic Chemistry, by Dr. H. B. Watson), review, 237
- Post-War Employment in the North-East: Considerations Affecting (Northern Industrial Group), 505
- Post-War Europe: Some Implications of Population Change for (F. W. Notestein), 33
- Post-War Industrial Reconstruction (Memorandum by the Internal Combustion Engine Manufacturers' Association), 76
- Post-War Organisation of Scientific Research in India (Sir J. C. Ghosh), 429
- Post-War Plans for Science (Association of Scientific Workers), 740
- Post-War University Education (C. D. Hardie), 57; (Dr. Maxwell Garnett), 142
- Post-War World: Science and Technology in the, 502
- Potassium *para*-Phenolsulphonate as a Buffer (E. E. Sager, M. R. Schooley and S. F. Acree), 532
- Potato: Photoperiodism in the (C. M. Driver and J. G. Hawkes), 318
- The Soil as a Source of Infection of Dry Rot of (Dr. T. Small), 436
- Potato (Soft Rot of) and Retting of Flax: Spore-forming Bacteria causing (L. A. Allen), 224
- Potato Eye Trade: Canadian Seed, 160
- Potato Products: Dried, and Nutritional Encephalomalacia in Chicks (R. H. Common and W. Bolton), 744
- Potatoes in a Hot, Dry Climate (Seed): Production of (Dr. J. E. van der Plank), 589
- Poultry: Feeding Waste Apples to (H. Temperton), 30
- Powdery Mildew of the Rose (Wilbur D. McCellan), 162
- Prawn Lender: Biology of the, 751
- Precognitive Telepathy: Experiments in (S. G. Soal and K. M. Goldney), review by Dr. E. J. Dingwall, 298
- Prehistory (New World): Cross Sections of, a Brief Report on the Work of the Institute of Andean Research, 1941-42 (Prof. Wm. Duncan Strong), 708
- Prenatal Mortality (Prof. F. W. Rogers Brambell and Ivor H. Mills), 558
- Prenatal Mortality and the Birth-Rate (Dr. A. S. Parkes), 245
- Pre-Neanderthal Man in the Crimea (Sir Arthur Keith), 515
- Preservation of Foods by Drying (Dr. Franklin Kidd), 100
- Preservatives: Testing Wood (J. Leutritz), 441
- Principle of Maximum Effect: Application of the (Dr. Hugh Nicol), 623
- Problems of Society: Psychology and (Progressive League series of lectures), 649
- Proboscidea, Vol. 2: Stegodontoidea, Elephantoida (Prof. Henry Fairfield Osborn), review by Prof. D. M. S. Watson, 5
- Products (Stored): The Larvæ of the Lepidoptera associated with (Dr. H. E. Hinton), 193
- Projection: Stereoscopic (A. C. W. Aldis), 767
- Prolamin Adhesives (Studies on Adhesives, Part 4), (D. Narayanamurti and V. Ranganathan), 173
- Promin Treatment of Leprosy (G. H. Paget, R. C. Pogge, F. A. Johansen, J. F. Dinan, B. M. Prejean and C. G. Eccles), 465
- Protein Hydrolysis in the Presence of 2,4-Dinitrophenylhydrazine: Slow (Dudley F. Cheesman and Gösta C. H. Ehrensård), 108
- Proteins and Formaldehyde: Reaction between (Dr. R. L. Wormell and Maurice A. G. Kaye), 525
- Psychiatry: Borderlands of (Prof. Stanley Cobb), review, 272
- Psychiatry of Frustration and Fulfilment in Adolescence (Course of lectures arranged by the National Council for Mental Hygiene), 79
- Psychology of International Peace, review by Dr. R. W. Pickford, 123
- Psychology towards the War Effort: Some Contributions of (H. B. Reed), 583
- Psychology and Problems of Society (Progressive League series of lectures), 649
- Psychology: Applied, at Cambridge, Unit for Research in (Medical Research Council), 617
- Psychology: Social, in a War Factory, review by Prof. T. H. Pear, 178
- Public Health in Colombia (Dr. Eduardo Santos), 340
- Public Health in Costa Rica (Dr. Rafael A. Calderón Guardia), 617
- Public Services: Training and Recruitment for, 91
- Publications (Special): An Idealist View of, 134
- Puccinia (Wheat-) Relationships (F. S. Thatcher), 28
- Pulmonary Disease: Tuberculosis and (Dr. G. Lapage), 783
- Pulsation Theory of Cepheid Variables (Prof. Svein Rosseland), 261
- Punjab: Age of the Saline Series in the Salt Range of the (Prof. B. Sahni), 462; (G. M. Lees), 654; (Dr. A. Lahiri), 654
- Purification of Water Supplies (George Bransby Williams), review by Dr. H. T. Calvert, 544
- Putrescine in the Biosynthesis of Hyoscyamine (B. T. Cromwell), 717
- Pyrethrins in Fly-Sprays: Activation of (W. A. L. David and P. Bracey), 594
- Pyrimidine Derivatives in the Growth of Group C (Lancefield) Streptococci upon a Simplified Medium: Importance of (Dr. H. J. Rogers), 251
- Pyrimidines: Growth Stimulation of *L. casei* by (Dr. F. W. Chattaway), 250
- Pyrophosphates: Organic and Inorganic, as Shock-inducing Agents (Marian Bielschowsky and Prof. H. N. Green), 524
- QUANTA: Prolégomènes à la théorie des (Prof. Thomas Greenwood), review by Prof. E. T. Whittaker, 268
- Quantum Theory: An Unambiguous Method of Avoiding Divergence Difficulties in (Prof. E. C. G. Stueckelberg), 143
- Quartz Crystal Face: Topography of (Dr. S. Tolansky), 195
- Quartz Plates: Frequency Performance of (W. P. Mason), 598
- Quaternions: Future of (Prof. W. Peddie), 85
- Quintana Roo, and Peten (Campeche): Archaeological Reconnaissance in (Karl Ruppert and John H. Denison, Jr.), 61

- RACE** : Individual, Family, Population and (Prof. Franz Boas), 33  
 Race and Crime (Willem Adriaan Bonger), translated from the Dutch by Margaret Mathews Hordyk, review by Prof. Cyril Burt, 509  
 Race and Rumors of Race (Howard W. Odum), review by Prof. H. J. Fleure, 667  
 Racial Discrimination, review by Prof. H. J. Fleure, 604  
 $\beta$ -Radiation from Active Phosphorus and Sodium (Kai Siegbahn), 221  
 Radiation Producing Penetrating Showers (Dr. L. Jánossy and Dr. G. D. Rochester), 259  
 Radiation (Electromagnetic) : Ground and Cloud Scatter of (T. L. Eckersley, G. Millington and J. W. Cox), 341  
 Radiations : Non-ionizing (Medical Research Council Committee on), 219  
 Radio : Basic (C. L. Boltz), review, 237  
 Radio Antennæ : Determination of Polar Diagrams of (H. Paul Williams), 50  
 Radio Communications : Comparative Merits of Different Types of Directive Aerials for (J. A. Smale), 228  
 Radio Equipment : Enemy Airborne (C. P. Edwards), 290  
 Radio Experimental Work : Measurements in (Dr. R. L. Smith-Rose), 50  
 Radio-Frequency Heating (N. R. Bligh), 430  
 Radio Industry : Plastics in the (E. G. Couzens and Dr. W. G. Wearmouth), review, 418  
 Radio Sets : Testing (J. H. Reyner), fourth and revised edition, review, 237  
 Radio-Technology (B. F. Weller), review, 180  
 Radio Transmission : Electricity and (Sir John Townsend), review, 237  
 Radio Waves (Very Short) : Theory of the Transmission of, review, 124  
 Radioactivity and the Origin of Life in Milne's Cosmology (Prof. J. B. S. Haldane), 555  
 Radioactivity in Osmium (Miss E. T. Lougher and Dr. S. Rowlands), 374  
 Radiochemistry of Aqueous Solutions (Dr. Joseph Weiss), 748  
 Rail and Road Transport in Britain, 490  
 Railway Signalling on London Transport (R. Dell), 648  
 Rainfall in the Nile Basin (H. E. Hurst and R. P. Black), 616  
 Rats (Male and Female) : Plasma Cholinesterase in (Dorothy B. Mundell), 557  
 Raw Materials : Supply and Allocation of, 740  
 Reaction between Solids (H. C. Castell, S. Dilnot and Mrs. Mary Warrington), 653  
 Reaction Kinetics in Solution (R. P. Bell), 718  
 Reactions of Amidines with derivatives of Malonic Acid (G. W. Kenner, B. Lythgoe, A. R. Todd and A. Topham), 59  
 Reactions of Ethylenes with 1,2-Diketones in Sunlight (Prof. Alexander Schönberg and Ahmed Mustafa), 195  
 Reader (Microfilm) : A New Form of (Dr. E. H. J. Schuster), 155  
 Reavell Lecture to be given under the auspices of the Institution of Chemical Engineers, 51  
 Reconstruction : Post-War Industrial (Memorandum by the Internal Combustion Engine Manufacturers' Association), 76  
 Relation of Relief to, 147  
 Thoughts on, 220  
 Recreations : Mathematical (Prof. Maurice Kraitchik), review, 271  
 Recruitment for Public Services : Training and, 91  
 Redstart : The Black, a New British Breeding Bird (R. S. R. Fitter), 659 ; (Prof. F. Wood Jones), 747  
 Refugees in Great Britain (P E P Broadsheet No. 216), 281  
 Regional Education, review by Prof. James Ritchie, 328  
 Regional Organization in Australasia, 582  
 Regional Planning (L. B. Escriet), review by Prof. A. E. Trueman, 7  
 Regional Planning and Research in the United States, 200  
 Rehabilitation : Aspects of, review, 329  
 Rehabilitation of the War Injured (edited by Dr. William Brown Doherty and Dr. Dagobert D. Runes), review, 329  
 Relaxation Processes in Statistical Systems (Dr. N. Krylov), 709  
 Relief : European, during 1919-20, 159  
 Relation of, to Reconstruction, 147  
 World Student (James L. Henderson), 152  
 Religion : Science and, review by the Very Rev. W. R. Matthews, 38  
 Religion, Science and Society in the Modern World (A. D. Lindsay), review by F. Ian G. Rawlins, 150  
 Reproduction : Mammalian, 162  
 Reproduction of the Woodlouse *Armadillidium vulgare* (Latr.), (Dr. Walter E. Collinge), 776  
 Reptiles of the World : Poisonous (Doris M. Cochran), 135  
 Research : Agricultural, Photography as a Tool in (Association for Scientific Photography discussion on), 719  
 Building, in the United States (Report of the British Building Mission), 349  
 Cancer, in Britain during 1942-1943, 276  
 Forest, in India and Burma, 1941-42, Part I, The Forest Research Institute, 201  
 Industrial, in New England, 200  
 Industrial, with special reference to India (J. J. Ghandy), 624  
 Industrial, and Taxation, 76  
 Industry and (Report of the F.B.I. Industrial Research Committee), 3  
 Regional Planning and, in the United States, 200  
 Road, 193 ; *erratum*, 249  
 Road Accidents and (Lieut.-Colonel Mervyn O'Gorman), 623  
 Science and, in Great Britain, 519  
 Scientific, in Great Britain, 539  
 Scientific, and Development (White Paper on), 519  
 Fundamental Scientific, and its Practical Importance (Sir Edward Appleton), 520  
 Scientific Industrial (Report of the London Chamber of Commerce), 294  
 Scientific and Industrial, in Great Britain, 293  
 Taxation and (Memorandum by the Parliamentary and Scientific Committee), 338  
 Research into Problems of Hearing and Deafness, 522  
 Research and Industry (Lord Riverdale), 337  
 Research in Industry : Application of (Dr. Andrew McCance), 458  
 Research and the Iron and Steel Industry (Prof. F. C. Thompson), 291  
 Research in Human Nutrition : Establishment by the Medical Research Council of a Unit for, 249  
 Research on the Photographic Process, review by Prof. N. F. Mott, 632  
 Research in Social Organization, review by Dr. M. L. Johnson, 269  
 Research and Development : Colonial, 119  
 Research Expenditure : Taxation and, 542  
 Research Fellowships in Medical Sciences at the University of Sheffield to be endowed by the J. G. Graves Trustees, 739  
 Research Studies in Education, 1939-40 : Bibliography of, review by T. Raymont, 207  
 Research Workers, their Education and Place in Industry (Dr. A. P. M. Fleming), 371  
 Retinene *in vitro* : Preparation of (Dr. R. A. Morton and T. W. Goodwin), 405  
 Retting of Flax : Spore-forming Bacteria causing Soft Rot of Potato and (L. A. Allen), 224  
 Rh Antibodies in Human Sera (F. Stratton), 773  
 Rh Genotypes in Man : Recognition of a Further Common (Dr. R. R. Race, Dr. G. L. Taylor, Prof. D. F. Cappell and Marjory N. McFarlane), 52  
 Rh in Mother and Son : The Rare Gene (Dr. R. R. Race and Dr. G. L. Taylor), 560  
 Rheological Properties of Matter under High Hydrostatic Pressure : Some (Dr. R. Dow), 78  
 Rheology : Literature of, 78  
 Rheology (General and Applied) : A Survey of (Dr. G. W. Scott Blair), review by Dr. L. R. G. Treloar, 543  
 Rheology (Theoretical) : Ten Lectures on (Dr. Markus Reiner), review by Dr. L. R. G. Treloar, 543  
 Rheology Reviews, 78  
 Rhesus Reaction : Mutation and the (Prof. J. B. S. Haldane), 106 ; (Prof. R. A. Fisher, Dr. R. R. Race and Dr. G. L. Taylor), 106  
 Rheumatic Fever : War and, 220  
 Rhinology and Folk-Lore (Dr. J. D. Rolleston), 648  
 Rhizobium : A Thermolabile Accessory Growth-factor to (Dr. H. K. Chen and M. K. Hsü), 21  
*Rhizobium trifolii* : Variation in the Nitrogen-fixing Property of (J. M. Vincent), 496  
 Rhum : The Geology of (Dr. E. B. Bailey), 351 ; (S. I. Tomkeiff), 351  
 Rhythms : Brain (Prof. E. D. Adrian), 360  
 Riboflavin Deficiency in Fowls, 78  
 Riboflavine : Microbiological Assay of (Dr. Frank C. Happold, Dr. F. W. Chataway and Dr. Mary Sandford), 225 ; (S. A. Price and H. C. H. Graves), 461  
 Rice : Vernalization of, by Short Days (Dr. S. M. Sircar), 378  
 Road Accidents and Research (Lieut.-Colonel Mervyn O'Gorman), 623  
 Road Accidents and Road Structure (W. W. Davies), 330  
 Road Research, 193 ; *erratum*, 249  
 Road Safety and Road Structure (W. W. Davies), 657  
 Road Structure : Road Accidents and (W. W. Davies), 330  
 Road Safety and (W. W. Davies), 657  
 Road Transport in Britain : Rail and, 490  
 Rock and Mineral Fragments : Cellulose Acetate Mounts for (Capt. A. T. J. Dollar), 226  
 Rodil District of South Harris : Archaean Gneisses of the (C. F. Davidson), 466  
 Roots (Excised Leguminous) : Cultures of (Moira P. McGonagle), 528  
 Roots (Monocotyledon) : Multiperforate Plates in Xylem Vessels of (B. C. Kundu), 58  
 Roozeboom's Type II of Solid Solution (Prof. A. N. Campbell), 530  
 Rosa Species : Ascorbic Acid and Hip Fertility in (Dr. Ake Gustafsson and Johan Schröderheim), 196 ; (Prof. J. W. Heslop Harrison and G. A. D. Jackson, 404 ; (Dr. Ronald Melville), 404  
 Rose : Powdery Mildew of the (Wilbur D. McCellan), 162  
 Rossi Second Maximum : Banded Meson Spectrum and the (S. V. Chandrasekhar Aiyar), 375  
 Rotation in Spiral Nebulae : Direction of (Edwin Hubble), 259 ; (Lindblad and Ohman), 259  
 Rothamsted : Development of Botanical Investigations at (Dr. James Davidson), 198  
 Royal Academy, 1944 : Science and Art at the (Dr. A. T. Hopwood), 643  
 Royal Commission on Population, 310, 387  
 Rubber Plants : Competitive (G. Martin), 212  
 Rubber-like Materials : Deformation of (J. E. Moyal), 777  
 Effect of Temperature upon the Mechanical Properties of (W. P. Fletcher), 341  
 Rubber-like Materials under Constant Stress and Constant Strain Conditions : Comparison of the Behaviour of (Dr. G. W. Scott Blair and B. C. Veinoglou), 165  
 Rye-Grass : Blind Seed Disease of (E. L. Calvert and A. E. Muskett), 287
- SAGGING** on Overhead Lines : Conductor (C. O. Boyse and N. G. Simpson), 192  
 Saline Series in the Salt Range of the Punjab : Age of the (Prof. B. Sahni), 462 ; (G. M. Lees), 654 ; (Dr. A. Lahiri), 654  
 Salmon (Sea Urchin and) : Gametes from the Sperm of (Prof. John Runnström, Sven Lindvall and Prof. Arne Tiselius), 285 ; *erratum*, 649  
 Salmonella : A New Antigen of (José Julio Monteverde and Ramon Hector Leiguarda), 589  
 Salt Range of the Punjab : Age of the Saline Series in the (Prof. B. Sahni), 462 ; (G. M. Lees), 654 ; (Dr. A. Lahiri), 654  
 Santonin : Reported Asymmetric Synthesis of (Prof. Charles S. Gibson), 225 ; (J. W. Cornforth Mrs. R. H. Cornforth and M. J. S. Dewar), 317  
 Scatter of Electromagnetic Radiation : Ground and Cloud (T. L. Eckersley, G. Millington and J. W. Cox), 341  
 Scattering of Light by Small Particles (H. Zanstra), 466  
 Scepticism : A Plea for, 220  
 Schuamasse, Comet : Re-discovery by Strömberg and Lundmark, 522  
 Schoellkopf Medal for 1944 of the Western New York Section of the American Chemical Society awarded to G. D. Bagley, 614  
 Scholarship : A Challenge to (W. Mansfield Clark), review by T. Raymont, 207  
 Scholarships : Agricultural (Ministry of Agriculture and Fisheries), 431  
 Part-time Day Advanced Mining (Miners' Welfare Commission), 492  
 Pharmaceutical, for Chinese Students, 459  
 University Entrance, in England and Wales, Report on (British Association Committee on Post-War University Education), 4  
 School Hygiene in Peru, 741

- School Mathematical Syllabuses: Reform of (Mathematical Association meeting on), 535
- Schools: Sex Teaching in (National Union of Teachers), 325
- Science: Basic for (C. K. Ogden), *review* by Dr. Maxwell Garnett, 205
- Post-War Plans for (Association of Scientific Workers), 740
- Wordsworth and (Dr. V. B. Wigglesworth), 367, 560; (H. A. Scruton), 560; (L. C. W. Bonacina), 716
- Science in China: The Place of (Yap Pow-Meng), 247
- Science and Art at the Royal Academy, 1944 (Dr. A. T. Hopwood), 643
- Science and Government (Dr. H. G. Moulton), 18
- Science and Industry (J. G. Bennett), 130
- Science and Industry in Great Britain (Lectures arranged by the Manchester Chamber of Commerce), 337, 371, 458, 520
- Science and Industry at Manchester, 337, 371, 458, 520
- Science and Learning in America: The Early History of (Proceedings of the American Philosophical Society, Vol. 87, No. 1), *review* by T. Raymont, 207
- Science and Religion, *review* by the Very Rev. W. R. Matthews, 38
- Science and Research in Great Britain, 519
- Science and Society in the Modern World: Religion, (A. D. Lindsay), *review* by F. Ian G. Rawlins, 150
- Science and Technology in the North-West of China (Dr. Joseph Needham), 238
- Science and Technology in the Post-War World, 502
- Science and the War (Kansas Academy of Science symposium on), 583
- Science in the New World Order, 63
- Science Class Lecture Ciné-Films (Dr. Quintin Moore, Thos. Smith Wylie and Frank G. Conway), 784
- Scientific Approach to Housing Problems, 725
- Scientific Centenaries in 1944 (Eng.-Capt. Edgar C. Smith), 14
- Scientific Ethical Principles, *review* by J. S. L. Gilmour, 94
- Scientific Industrial Research (Report of the London Chamber of Commerce), 294
- Scientific Men in Government Service, 18
- Scientific Methods: Staff Selection by (R. C. Woods and A. S. MacDonald), 741
- Scientific Personnel in the Aircraft Industry, 49
- Scientific Personnel in Industry, 3
- Scientific Research in Great Britain, 539
- Scientific Research in India: Post-War Organisation of (Sir. J. C. Ghosh), 429
- Scientific Research and Development, 490, 519
- Scientific Research and its Practical Importance: Fundamental (Sir Edward Appleton), 520
- Scientific Terminology, 218
- Scientific Thought: An Unscientific History of, *review* by Sir Harold Spencer Jones, 67
- Influence of Newton's Work on (N. Teich), 42
- Scientific and Industrial Research in Great Britain, 293
- Scotland: The Highlands of, Proposals for Development (Hugh Quigley), 552
- Scottish Island (Western): Pioneering Farming on a, *review* by Seton Gordon, 390
- Scurvy: Relation of, to Histological Changes in the Pancreas (Dr. Sachchidananda Banerjee), 344
- Sea-Birds: White Plumage of (Dr. K. J. W. Craik), 288, 527; (Sir John Graham Kerr), 347; (Dr. M. H. Pirene and Dr. A. C. Crombie), 526; (Edward A. Armstrong), 527; (D. S. Falconer), 777
- Sea Loch: A Fish-Farming Experiment in a (Dr. F. Gross and J. E. G. Raymont and Dr. S. M. Marshall and Dr. A. P. Orr), 483
- Sea Urchin Egg: Mechanism of Formation of the Fertilization Membrane in the (Prof. John Runnström, Dr. Ludwik Monné and Miss Elsa Wicklund), 313
- Sea Urchin and Salmon: Gametes from the Sperm of (Prof. John Runnström, Sven Lindvall and Prof. Arne Tiselius), 285; *erratum*, 649
- Sea Water: Effect of Drinking Small Quantities of (Dr. W. S. S. Ladell), 385
- Searchlight Mirrors: Metallic (Lord Rayleigh), 112
- Seaweed: Flu-tuations in (Dr. E. M. Delf), 223
- Seaweed Products in Australia (E. J. Ferguson Wood and Valerie May Jones), 263
- Secondary Education: The Open Door in (Nuffield College Social Reconstruction Survey Education Sub-Committee), 17
- Secondary Education in Great Britain, 17
- Sedimentary Petrology: Statistics in (Dr. P. Allen), 71
- Seed Potatoes in a Hot, Dry Climate: Production of (Dr. J. E. van der Plank), 589
- Seeing, Lighting and: Ventilation and Heating; (Industrial Health Research Board Pamphlet No. 1), 50
- Seismic Movements: Man's Influence on, 219
- Seismology: Bibliography of (Ernest A. Hodgson), Vol. 13, No. 13, 491
- Selenium Rectifier Photocells: Fatigue in (J. S. Preston), 680
- Semiosis: Analytic Statements in (John R. Reid), 191
- Sera (Human): Rh Antibodies in (F. Stratton), 773
- Serum (Human): An 'Incomplete' Antibody in (Dr. R. R. Race), 771
- Service of Man: Geology in the (Prof. W. G. Fearnside and Dr. O. M. B. Bulman), *review* by Prof. P. G. H. Boswell, 756
- Metals in the (Arthur Street and William Alexander), *review* by Dr. S. W. Smith, 634
- Sex Teaching in Schools (National Union of Teachers), 325
- Shasta Dam: The Possible Effect of Earthquakes in the Building of the (Kenneth B. Keener), 491
- Shell Formation in the Domestic Fowl: Carbonic Anhydrase, Sulphonamides and (R. Benesh, N. S. Barron and C. A. Mawson), 138
- Shells (Molluscan): Occurrence of Strontium in (E. R. Trueman), 142
- Shock by Heat: Treatment of (A. W. Kay), 291
- Shock-inducing Agents: Organic and Inorganic Pyrophosphates as (Marian Bielschowsky and Prof. H. N. Green), 524
- Signalling: Railway, on London Transport (R. Dell), 648
- Silver in Mercury: Solubility of (Dr. D. R. Hudson), 259
- Silver Amalgams: Correlation of Thixotropic Setting with Density in (Dr. D. R. Hudson), 562
- Singlet Terms in the Spectrum of Molecular Nitrogen (Dr. A. G. Gaydon and Dr. R. E. Worley), 747
- Skokholm, *review* by Sir D'Arcy Thompson, 270
- Skull: An Early Swanscombe (Prof. M. F. Ashley Montagu), 347
- Sky: The Night, in January, 19; in February, 135; in March, 249; in April, 373; in May, 522; in June, 649; in July, 770
- Slags (Basic Open Hearth): Solubility of (B. W. Methley and H. J. Turner), 778
- Sleep: Induction of, by Simultaneous Administration of Posterior Pituitary Extracts and Water (Dr. F. Schütz), 432
- Social Biology: Summer School in (British Social Hygiene Council), 373, 708
- Social Force: The International Labour Organization as a, 415
- Social Medicine, 443
- Social Medicine based on Social Statistics (Prof. P. Sargent Florence), 363
- Social Organization: Research in, *review* by Dr. M. L. Johnson, 269
- Social Psychology in a War Factory, *review* by Prof. T. H. Pear, 178
- Social Security Planning in the United States (Eveline M. Burns), 191
- Social Statistics: A Social Medicine based on (Prof. P. Sargent Florence), 363
- Social Survey: War-time (Kathleen Box and Geoffrey Thomas), 647
- Society: Conscience and (Dr. Ranyard West), *review* by Dr. R. W. Pickford, 123
- Psychology and Problems of (Progressive League series of lectures), 649
- Society in the Modern World: Religion, Science and (A. D. Lindsay), *review* by F. Ian G. Rawlins, 150
- Sociology of Crime, *review* by Prof. Cyril Burt, 509
- Sodium (Active Phosphorus and):  $\beta$ -Radiation from (Kai Siegbahn), 221
- Sodium Sulphate as an Agent Causing the Development of the 'Chloride-secreting Cells' in *Macropodus* (C. K. Liu), 252
- Soft Rot of Potato and Retting of Flax: Spore-forming Bacteria causing (L. A. Allen), 224
- Soil as a Source of Infection of Dry Rot of Potato (Dr. T. Small), 436
- Soil (Black Cotton): Nitrogenous Manuring of (Dr. A. Sreenivasan), 55
- Soil Erosion in New Zealand: Contrasting Regional Morphology of (K. B. Cumberland), 492
- Soil Fertility: Termites and (A. M. Adamson), 531
- Soil Sterilization (Society of Chemical Industry (Microbiological Panel of the Food Group and the Agricultural Group) and the Association of Applied Biologists discussion on), 736
- Soils and Oxide Surfaces: Nitrogen Loss from (Prof. N. R. Dhar and Dr. N. N. Pant), 115
- Solar Activity: Magnetic Storms and (Dr. C. W. Allen), 452
- Solar Corona: Constitution of the (H. Alfvén), 59
- On the Distribution of Intensity within the (Dr. H. A. Brück), 452
- Solar Flares and Magnetic Storms (H. W. Newton), 452, 532
- Solar Phenomena and some Allied Geophysical Effects (Royal Astronomical Society discussion on), 452
- Solar Prominences (E. Pettit), 29
- Solar System: Origin of the (Dr. Harold Jeffreys), 140; (Lieut.-Colonel K. E. Edgeworth), 140; (Dr. A. Hunter), 255
- Solid: Influence of an Adsorbed (Inner) Layer on the Cohesion of a (Prof. Carl Benedicks and Per Sederholm), 109; (L. C. Bannister), 315
- Solid Solution: Roozeboom's Type II of (Prof. A. N. Campbell), 530
- Solids: Reaction between (H. C. Castell, S. Dilnot and Mrs. Mary Warrington), 653
- Solids and Dipole Moments: Relationship between Dielectric Constant of Liquids and (S. K. Kulkarni Jatkar), 222
- Solubility of Basic Open Hearth Slags (B. W. Methley and H. J. Turner), 778
- Solubility of Silver in Mercury (Dr. D. R. Hudson), 259
- Solubilization of Dyes in Non-aqueous Solvents (Dr. S. R. Palit), 317
- Solutions (Aqueous): Radiochemistry of (Dr. Joseph Weiss), 748
- Solutions and Suspensions: Flocculation in (Dr. E. Mardles), 746
- Solvents (Non-aqueous): Solubilization of Dyes in (Dr. S. R. Palit), 317
- Son (Mother and): The Rare Gene *Rhy* in (Dr. R. R. Race and Dr. G. L. Taylor), 560
- Song Sparrow and other Passerines: Behaviour of the (Mrs. M. M. Nice), 144
- Sow's Milk: Fat of (P. B. D. de la Mare and F. B. Shorland), 380
- Spain: Earthquakes registered during September, 163; during November, 402; during December, 431; during January, 741
- Spanish Possessions of the New World and Far East: Early, *review* by Dr. J. N. L. Baker, 299
- Sparrow: A Deluded (Dr. K. G. Britton), 559
- Sparrow (Song) and other Passerines: Behaviour of the (Mrs. M. M. Nice), 144
- Specific Heat of Metals: Determination of (H. W. Baxter), 316
- Spectra of Comets (Visual): Polyatomic Emission in the, 59
- Spectrum of Carbon Monoxide 'Cool Flame' (Dr. A. G. Gaydon), 259
- Spectrum of Molecular Nitrogen: Singlet Terms in the (Dr. A. G. Gaydon and Dr. R. E. Worley), 747
- Sperm of Sea Urchin and Salmon: Gametes from the (Prof. John Runnström, Sven Lindvall and Prof. Arne Tiselius), 285; *erratum*, 649
- Spermatzoa (Bull): Acetate Utilization for Maintenance of Motility of (Henry A. Lardy and Dr. Paul H. Phillips), 168
- Spinal Cord: Synaptic Transmission in the (Prof. John C. Eccles), 432
- Sporozoids of *Plasmodium gallinaceum*: A Method for Collecting, by Feeding Infected *Aedes aegypti* through Animal Membranes (Dr. Ann Bishop and Barbara M. Gilchrist), 713
- Spraying: Orchard, for Commercial Growers (J. Turnbull), 51
- St. John's Wort (*Hypericum perforatum* L.): The Entomological Control of (Frank Wilson), 785; (Dr. A. D. Imms), 785
- St. Louis Chapter of the Society of the Sigma Xi installed at St. Louis University, 679
- Staff Selection by Scientific Methods (R. C. Woods and A. S. MacDonald), 741
- Star Atlas and Reference Handbook (Epoch 1950), (Arthur P. Norton and J. Gall Inglis), ninth edition, *review*, 8
- Star Recognition (Flight-Lieut. Francis Chichester), *review*, 179
- Starch and its Derivatives (J. A. Bradley), second edition revised, *review*, 391
- Stars: Metals in the (Sir Harold Spencer Jones), 163
- Multi-Colour Photometry of (J. Stebbins and A. E. Whitford), 29
- Recognition of the, *review*, 179
- Stars of the Galaxy: Partition of Energy among the (—, Vyssotsky and —, Williams), 114
- Stars of Small Masses: Hydrogen Content of the Sun and of (Prof. N. R. Sen and U. Burman), 166
- Stars with Large Proper Motions (A. van Maanen), 585
- State: Fundamental Scientific Research and the, 520
- (National): The Crisis of the (Dr. W. Friedmann), *review* by Prof. George Catlin, 359

- Statistical Law in Nature (Prof. Erwin Schrödinger), 704  
 Statistical Mechanics of Fields and the 'Apeiron' (Prof. Max Born and H. W. Peng), 164  
 Statistical Methods for Government Departments, 88  
 Statistical Study of Literary Vocabulary (G. Udny Yule), *review* by M. G. Kendall, 570  
 Statistical Systems: Relaxation Processes in (Dr. N. Krylov), 709  
 Statistics: Mathematical (S. S. Wilks), *review*, 8  
 (Morbidity): A Provisional Classification of Diseases and Injuries for use in compiling (Medical Research Council, Special Report Series No. 248), 584  
 (Official): Memorandum on (Royal Statistical Society), 88  
 (Social): A Social Medicine based on (Prof. P. Sargant Florence), 363  
 Statistics of Literary Vocabulary, *review* by M. G. Kendall, 570  
 Statistics in Sedimentary Petrology (Dr. P. Allen), 71  
 Steel Industry (Iron and): Research and the (Prof. F. C. Thompson), 291  
 Steel Surfaces (Lacquered): Filiform Underfilm Corrosion of (C. F. Sharman), 621  
 Steels for Power Plant and the Factors Affecting their Magnetic Properties: A Survey of Electrical Sheet (F. Brailsford), 192  
 Stellar Morphology in Species of Dryopteris: Experimental Observations on the Relation between Leaf Development and (Prof. C. W. Wardlaw), 377  
 Stellar Companions of Small Mass, 59  
 Stenaler (Danmarks): Landnam i (Johs. Iversen), 511  
 Stereoscopic Projection (A. C. W. Aldis), 767  
 Steroid Hormones: Chemical Structure and Antifibromatogenic Activity of (Dr. Alonzer Lipschütz), 260  
 Stilboestrol Administration: Behavioural Changes in Spayed Female Guinea Pigs after (Dr. P. Bacsich and Dr. G. M. Wyburn), 346  
 Stone Age (Denmarks): Land Occupation in (Johs. Iversen), 511  
 Strain Conditions (Constant Stress and Constant): Comparison of the Behaviour of Rubber-like Materials under (Dr. G. W. Scott Blair and B. C. Veinoglu), 165  
 Streptococci upon a Simplified Medium: Importance of Pyrimidine Derivatives in the Growth of Group C (Lancefield) (Dr. H. J. Rogers), 251  
 Stress and Constant Strain Conditions (Constant): Comparison of the Behaviour of Rubber-like Materials under (Dr. G. W. Scott Blair and B. C. Veinoglu), 165  
 Strontium in Molluscan Shells: Occurrence of (E. R. Trueman), 142  
 Structure of Boron Hydrides (H. C. Longuet-Higgins and R. P. Bell), 59  
 Structure of Clouds, *review*, 96  
 Structure of the Nitrogen Peroxide Molecule (H. C. Longuet-Higgins), 408; *erratum*, 459  
 Structure, Function and Synthesis of Polysaccharides (Prof. W. N. Haworth), 785  
 Structure (Road): Road Accidents and (W. W. Davies), 330  
 Student Relief: World (James L. Henderson), 152  
 Substances (Some Pure): Growth-Inhibiting Action of (A. K. Powell), 345  
 Sulphanilamide: Inhibition of the Growth of Oat Roots: *p*-Aminobenzoic Acid and its Effect on the (R. Forbes Jones), 379  
 Sulphonamide: Treatment of a Virus Disease of Chickens with (F. D. Asplin), 253  
 Sulphonamides and Shell Formation in the Domestic Fowl: Carbonic Anhydrase, (R. Benesch, N. S. Barron and C. A. Mawson), 138  
 Sulphur-containing Amino-Acids and Jaundice (Prof. R. A. Peters, Dr. R. H. S. Thompson, Lieut.-Colonel A. J. King, Major D. I. Williams and Major C. S. Nicol), 773  
 Sun from the Earth: Measuring the Distance of the (Sir Harold Spencer Jones), 181  
 Sun and of Stars of Small Masses: Hydrogen Content of the (Prof. N. R. Sen and U. Burman), 166  
 Sun's Limb: Polarization in Fraunhofer Lines at the (R. O. Redman), 718  
 Sunflower Plants: Oil from the (E. F. Hurt), 248  
 Sunflowers as an Oil Seed Crop, 401  
 Sunlight: Reactions of Ethylenes with 1,2-Diketones in (Prof. Alexander Schönberg and Ahmed Mustafa), 195  
 Sunn Hemp Seed Proteins as Plywood Adhesives: Preliminary Note on the Use of (Dr. D. Narayanamurti, V. Ranganathan and D. C. Roy), 173  
 Sunspot Prominences, some Comparisons between Limb and Disk Appearances (M. A. Ellison), 452  
 Surface of Growing Plant Cells: Physico-Chemical Properties of the (Prof. H. Lundegårdh and G. Stenlid), 618  
 Surface Flow of Liquid Helium II and Bose-Einstein Degeneracy (Prof. D. V. Gogate and R. N. Rai), 342  
 Surgery: Thoracic (R. C. Brock), 784  
 Surgical Achievement in the U.S.S.R. during War: Medical and (E. Rock Carling), 419  
 Surgical Unit: The Airborne (C. J. Longland and L. Kessel), 429  
 Surveys: Budgetary and Dietary (Nutrition Society conference on), 306, 585  
 Surveys (Colonial Geographical): Function and Future of (Y. A. Eyles), 273; (Dr. J. D. Falconer), 409; (Imperial Institute), 582  
 Suspensions (Solutions and): Flocculation in (Dr. E. Mardles), 746  
 Swanscombe Skull: An Early (Prof. M. F. Ashley Montagu), 347  
 Sweden: A Medical Nobel Institute in, 615  
 Switching: Remote, by Superimposed Currents (J. L. Carr), 708  
 Sycamore Tree (Alexander L. Howard), 348; (Lord Brabazon of Tara), 498  
 Synaptic Transmission in the Spinal Cord (Prof. John C. Eccles), 432  
 Synthesis: A Case of Total Asymmetric (Miss K. D. Paranjape, N. L. Phlanikar, Prof. B. V. Bhide and K. S. Nargund), 141  
 Synthesis of Adenine (J. Baddiley, B. Lythgoe and A. R. Todd), 59  
 Synthesis of Ascorbic Acid (Biological): Role of Manganese in the (M. N. Rudra), 743  
 Synthesis of Polysaccharides: Structure, Function and (Prof. W. N. Haworth), 785  
 Synthesis of Santonin: Reported Asymmetric (Prof. Charles S. Gibson), 225; (J. W. Cornforth, Mrs. R. H. Cornforth and M. J. S. Dewar), 317  
 Syphilis: The Rapid Treatment of (Major James Marshall), 187  
 Systems Protected by Petersen Coils: A Modern Earth-Fault Relay Equipment for use on (L. B. S. Golds and C. L. Lipman), 469
- T**ANGANYIKA: Mineral Resources of (Sir Edmund Teale and F. Oates), 740  
 Tannic Acid and Burns (S. L. Rae and A. W. Wilkinson), 583; (R. H. Franklin), 584  
 Tattersall Memorial Fund, 521  
 Tautomerism of Cyanamide (Dr. L. Hunter and H. A. Rees), 284  
 Taxation: Industrial Research and, 76  
 Taxation and Research (Memorandum by the Parliamentary and Scientific Committee), 338  
 Taxation and Research Expenditure, 542  
 Tea: Technology of (Dr. E. B. Hughes), 339  
 Teachers: Recruitment and Training of—Primary and Secondary School Teachers, 601; Youth Leaders and Teachers in Young People's Colleges, 629; Technical Colleges and Schools, 663  
 Teachers and Youth Leaders (McNair Report on), 601, 629, 663  
 Technical Colleges and Schools, 663  
 Technical Education: Committee on, 458  
 Technical Education of the Future (Dr. D. S. Anderson), 561  
 Technique of Blood-Grouping, *review* by Dr. J. A. Fraser Roberts, 95  
 Technology: The Promise of (Dr. F. B. Jewett), 502  
 Technology of Tea (Dr. E. B. Hughes), 339  
 Technology: Science and, in the North-West of China (Dr. Joseph Needham), 238  
 Technology: Science and, in the Post-War World, 502  
 Telecommunications: International (Brig.-General Sir Osborne Mance), 567  
 Telepathy (Precognitive): Experiments in (S. G. Soal and K. M. Goldney), *review* by Dr. E. J. Dingwall, 298  
 Teletypewriter Test Set (W. Y. Lang), 161  
 Television After the War: Development of (Committee appointed by the Government), 135  
 Tellurium and Copper Carbonyls (Dr. P. L. Robinson and K. R. Stainthorpe), 2; *erratum*, 593  
 Temperature: Effect of, on the Reducing Activity of Leucocytes in Milk (C. S. Morris), 436  
 Effect of, upon the Mechanical Properties of Rubber-like Materials (W. P. Fletcher), 341  
 Tent Caterpillar in India (K. A. Rahman and A. N. Kalra), 113  
 Terminological Inexactitudes: Microphotography and Photomicrography, and other (Editor of *Photographic Abstracts*), 218  
 Terminology: Photographic, 218  
 Scientific, 218  
 Terminology of Nucleic Acids (Prof. J. Masson Gulland, G. R. Barker and D. O. Jordan), 494  
 Termites and Soil Fertility (A. M. Adamson), 531  
 Terrestrial Algae: A New Genus of (Prof. F. E. Fritsch), 620  
 Thermal Fatigue of Metals (W. Boas and R. W. K. Honeycombe), 494; *erratum*, 770  
 Thermoplastic Electric Cables (Dr. H. Barron, J. N. Dean and T. R. Scott), 248  
 Thiourea as Protective Agent for Vitamin C (E. Kawerau and W. R. Fearon), 384  
 Thixotropic Setting with Density in Silver Amalgams: Correlation of (Dr. D. R. Hudson), 562  
 Thompson (Silvanus) Memorial Lecture of the British Institute of Radiology (Prof. Sidney Russ), 588  
 Thoracic Surgery (R. C. Brock), 784  
 Thought (Scientific): Influence of Newton's Work on (N. Teich), 42  
 An Unscientific History of, *review* by Sir Harold Spencer Jones, 67  
 Thyroid Gland: Newer Knowledge of the Biochemistry of the (Dr. C. R. Harington), 312  
 Tifus Exantemático: Técnicas de Laboratorio en el (Prof. Clavero del Campo and Dr. Perez Gallardo), 537  
 Tilden Lecture for 1943 of the Chemical Society (R. P. Bell), 718  
 Tilden Lecture for 1944 of the Chemical Society (Dr. H. W. Thompson), 79, 209  
 Timber-drying Kilns: Observations on the Design of (Forest Products Research Laboratory, Leaflet No. 30), 339  
 Timbers: Some South American, 564  
 British (E. H. B. Boulton and B. Alwyn Jay), *review*, 477  
 Time Corrections by Equal Altitudes (Zinger's Method) for 1941: Ephemerides for the Determination of (Astronomical Institute of Sciences of the U.S.S.R.), 29  
 Toledo: Earthquakes registered during February, 649  
 Tomato: Mosaic Disease and Fruiting of the (Ireson W. Selman), 531  
 Tongues: The Gift of (Prof. Margaret Schlauch), *review* by Capt. T. H. Hawkins, 68  
 Topography of a Quartz Crystal Face (Dr. S. Tolansky), 195  
 Tortoise: Achilles and the (Prof. F. G. Donnan), 142, 464; (Group-Captain G. Silyn Roberts), 464  
 Toxicity of *p*-Amino-Benzene-Sulphonamide to Higher Plants and Fungi: Effect of *p*-Amino-Benzoic Acid on the (Dr. P. W. Brian), 83  
 Trade Controls, their Causes and Nature: Quantitative (Prof. G. Haberler and M. Hill), 411  
 Trade Relations between Free-Market and Controlled Economies (Prof. J. Viner), 412  
 Trade Unions: British (Mrs. Mary Agnes Hamilton), 553  
 Trade and Economics in the International Sphere, 411  
 Training of Chemists: The Education and (Report of the Chemistry Education Advisory Board), 353  
 Training for Citizenship (Report of the Advisory Council on Education in Scotland), 265; (G. E. Cleaver), 437  
 Training of a Regional Planner, *review* by Prof. A. E. Trueman, 7  
 Training and Recruitment for Public Services, 91  
 Transformation of Pneumococcal Types (Dr. W. T. J. Morgan), 763  
 Transformers (Large): Economic Flux Density in (D. J. Bolton), 19  
 Transformers (Motors and): Economic Rating of (D. J. Bolton), 282  
 Transfusion into the Bone Marrow (Hamilton Bailey), 258  
 Transmission of Very Short Radio Waves: Theory of, *review*, 124  
 Transmission-Line Problems and the Impedance Circle Diagram (Willis Jackson and L. G. H. Huxley), 319  
 Transmission Line Supports (E. C. Neate and W. F. Bowling), 679  
 Transmitting Arrays (Horizontal Dipole): The Measured Performance of (Harold Page) 312  
 Transport in Britain: Rail and Road, 490  
 Transport (London): Railway Signalling on, (R. Dell), 648



Tree : The Cedar (Alexander L. Howard), 595  
 The Oak (Alexander L. Howard), 438  
 The Sycamore (Alexander L. Howard), 348 ; (Lord Brabazon of Tara), 498  
 Trichinosis in Great Britain : A Search for Endemic Areas of (E. L. Taylor), 745  
 Trichromatic Vision : Theories of (Prof. H. Hartridge), 45  
 Tricotyledony (H. E. Holtrop), 13  
*Troides* Hübner (Lepidoptera Papilionidae) and its Allies ; Distribution and Phylogeny in relation to the Geological History of the Australasian Archipelago : Studies in the Systematics of (Dr. F. E. Zeuner), 32  
 Trout (Brown) : Nature of the Acid in Soft Water in relation to the Growth of (R. E. Sawyer), 55 ; (F. T. K. Pentelow), 464  
 Truth in Anthropology (Verrier Elwin), 624 ; (Prof. J. H. Hutton), 624  
 Trypan Blue and Growth of the Adrenal Cortex in Mice (Prof. M. K. McPhail), 460  
 Tuberculosis in Paraguay (Dr. A. R. Ginés, Dr. A. Alvarez and Dr. M. Mercado), 248  
 Tuberculosis and Pulmonary Disease (Dr. G. Lapage) 783  
 Tuberculosis Survey in Fiji, 193  
 Tubes (Vacuum) : Noise Measurement in (J. J. DeBuske), 114  
 Turgor and the Cytoskeleton of Nerve Fibres : Contraction, (J. Z. Young), 333  
 Turkey : Earthquake on February 1, 193, 554  
 Tuthankhamen's Tomb (King) : Analysis of Barley from (Dr. E. C. Barton-Wright, R. G. Booth and W. J. S. Pringle), 288  
 TV A, Adventure in Planning (Prof. Julian Huxley), review by R. Brightman, 508  
 Twentieth Century Philosophy (edited by Dr. Dagobert D. Runes), review by T. Raymont, 207  
 Typhus : Control of (Dr. G. Lapage), 536  
 Typhus in Venezuela (Dr. L. Briceno-Iragorry), 51  
 Typhus Fever in Bolivia, 162  
 Typhus Vaccine supplied to Governments in the Middle East by the United States Government, 554

**U**NDULANT Fever in Chile (Enrique Onetto), 617  
 United Nations Educational Reconstruction Plans, 520  
 United States : Building Research in the (Report of the British Building Mission), 349  
 Cerebrospinal Meningitis in, 162  
 Immunizations in Large Cities of the (Selwyn D. Collins and Clara Council), 249  
 Regional Planning and Research in the, 200  
 Social Security Planning in the (Eveline M. Burns), 191  
 United States (Canada and the) : Geophysical Exploration in, 503  
 Universe : Man and his Expanding, 459  
 Universities : The Development of the (Sir Ernest Simon), 471  
 University Developments (Association of University Teachers Report on), 471  
 University Education : Post-War (C. D. Hardie), 57 ; (Dr. Maxwell Garnett), 142  
 University Entrance Scholarships in England and Wales : Report on (British Association Committee on Post-War University Education), 4  
 University of Colorado Studies, Vol. 2 (Prof. MacKeehan), 61  
 Unstriated Muscle : Viscosity and Contraction of (Major Inderjit Singh), 591  
 Urease Activity and Ascorbic Acid (Dr. K. V. Giri and P. Seshagiri Rao), 253  
 Urine : *p*-Cresol and Oestron in (N. R. Campbell and Dr. D. H. Hey), 745  
 U.S.S.R. : Action of the Germans in the, 49  
 Newton's "Principia" for the, 75  
 U.S.S.R. during War : Medical and Surgical Achievement in the (E. Rock Carling), 419

**V**ACATION Work Scheme of the Imperial College Union, 401  
 Vacuum Freezing : Centrifugal (R. I. N. Greaves), 485  
 Vacuum Tubes : Noise Measurement in (J. J. DeBuske), 114  
 Vaporization of Lactic Acid as an Aerial Bactericide (J. E. Lovelock, O. M. Lidwell and W. F. Raymond), 743  
 Vectographs' : 'Polaroid', 458  
 Venezuela : Nutrition Problems in, 553  
 Typhus in (Dr. L. Briceno-Iragorry), 51  
 (in the Gulf of) : Earthquakes on December 21 and 23, 554  
 Ventilation and Heating : Lighting and Seeing (Industrial Health Research Board Pamphlet No. 1), 50  
 Vernalization of Rice by Short Days (Dr. S. M. Sircar), 378  
 Vertebrate Host : Biology of the Malarial Parasite in the (Dr. D. G. Davey), 110  
 Vesalius, Andreas : A Bio-Bibliography of (Harvey Cushing), review by Prof. F. J. Cole, 694  
 Vesalius and the Struggle for Intellectual Freedom (Prof. Howard W. Haggard), 707  
 Veterinarian and the Colonies : The (Major J. M. Smith), 60  
 Veterinary Education in Great Britain (A. W. Whitehouse), 227  
 Veterinary Profession : Education for the, 35  
 Veterinary Surgeons and Military Service, 19  
 Virus Disease of Chickens with Sulphonamides : Treatment of a (F. D. Asplin), 253  
 Viruses : Nature of the (Prof. B. F. Osorio Tafall), 402  
 Viscosity and Contraction of Unstriated Muscle (Major Inderjit Singh), 591  
 Visibility of Blue and Yellow (Prof. H. Hartridge), 775  
 Vision (Trichromatic) : Theories of (Prof. H. Hartridge), 45  
 Visual Process : Chemical Aspects of the (Dr. R. A. Morton), 69  
 Vitalism : Wöhler's 'Synthetic' Urea and the Rejection of—a Chemical Legend (Dr. Douglas McKie), 608  
 Vitamin Content of Beverages : Unconsidered Trifles in our Diet (Sir J. C. Drummond and Dr. T. Moran), 99  
 Vitamin A Aldehyde (Dr. R. F. Hunter and E. G. E. Hawkins), 194  
 Vitamin B Complex : New Components of the (Dr. E. C. Barton-Wright, W. B. Emery and F. A. Robinson), 771  
 Vitamin B<sub>2</sub> Complex : The Nature of the (F. A. Robinson), 478

Vitamin C : Intracellular Localization of (Dr. Geoffrey H. Bourne), 254  
 Thiourea as Protective Agent for (E. Kawerau and W. R. Fearon), 384  
 Effect of, on the Adrenaline Content of the Adrenal Glands of Guinea Pigs (Sachchidananda Banerjee), 526  
 Localization of, in *Belascaris marginata* (G. R. Hill and J. D. Smyth), 21  
 Vitamin C in Plants—'Nasturtium' (*Tropaeolum majus*) (Maurice D. Sutherland), 683 ; Iris (*Iris germanica*) (Dr. Emil J. Baumann), 683 ; Indian Gooseberry (*Phyllanthus emblica*) (Dr. M. Srinivasan), 684  
 Vitamins and Hormones (edited by Prof. Robert S. Harris and Prof. Kenneth V. Thimann), Vol. 1, review by Dr. A. S. Parks, 151  
 Vocabulary (Literary) : The Statistical Study of (G. Udny Yule), review by M. G. Kendall, 570  
 Volcano : Kilimanjaro, an Active (Dr. P. E. Kent), 454  
 Von Wright (Hr.) on the Logic of Induction (Prof. C. D. Broad), 430

**W**AR : Bacteriology, Medicine and the (N. P. Sherwood), 583  
 Employment After the (Social Credit Co-ordinating Committee Memorandum), 615  
 Medical and Surgical Achievement in the U.S.S.R. during (E. Rock Carling), 419  
 Parasitic Diseases of Man in relation to the (Dr. G. Lapage), 625  
 Science and the (Kansas Academy of Science symposium on), 583  
 Development of Television After the (Committee appointed by the Government), 135  
 War (Present) : Geology in the (J. C. Frye and C. P. Kaiser), 583  
 War and Rheumatic Fever, 220  
 War Camouflage (Sir John Graham Kerr), 347  
 War Effort : Chemistry and the (J. W. Greene), 583  
 The Place of Food in the (L. E. Cull), 583  
 The Place of Physics in the (J. H. McMillan), 583  
 Some Contributions of Psychology toward the (H. B. Reed), 583  
 Relation of Zoology to the (J. Breukelman), 583  
 War Factory : Social Psychology in a, review by Prof. T. H. Pear, 178  
 War Injured : Rehabilitation of the (edited by Dr. William Brown Doherty and Dr. Dagobert D. Runes), review, 329  
 War Wounds : The Use of Penicillin in Treating (Medical Research Council War Memorandum No. 12), 767  
 War Years : Canadian Mortality in, 282  
 War (Peace and) : Muscular and Mental Relaxation in (Dr. E. J. Boome), 547  
 War-time : Australian Forestry in, 490  
 The Role of Botany in (P. B. Sears), 583  
 Cerebrospinal Meningitis in, 162  
 Women's Health in, 77  
 War-time Social Survey (Kathleen Box and Geoffrey Thomas), 647  
 Water (Soft) in relation to the Growth of Brown Trout : Nature of the Acid in (R. E. Sawyer), 55 ; (F. T. K. Pentelow), 464  
 Water (Electrolysis of) : The Production of Hydrogen and Oxygen by the (C. E. Bowen), 78  
 Water (Posterior Pituitary Extracts and) : Induction of Sleep by Simultaneous Administration of (Dr. F. Schütz), 432  
 Water (Sea) : Effect of Drinking Small Quantities of (Dr. W. S. S. Ladell), 385  
 Water Contents of Last-stage Larvæ, Pupæ and Adults of the Meal Moth (Dr. Ludwig Auber and J. E. G. Raymont), 314  
 Water Moulds : Species of Phytophthora as (Elizabeth Blackwell), 496  
 Water Policy : A National (White Paper on), 581  
 Water Resources of Great Britain (H. U. Willink), 219  
 Water Supplies : The Purification of (George Bransby Williams), review by Dr. H. T. Calvert, 544  
 Water Supply in Great Britain, 581  
 Wave Filters (Dr. L. C. Jackson), review by Dr. L. E. C. Hughes, 635  
 Weather Phenomena : Clouds and (C. J. P. Cave), second edition revised, review by Prof. D. Brunt, 237  
 Weatherwise (John H. Willis), review by E. G. Bilham, 756  
 Wellcome-Marston Excavations at Lachish, Palestine (Olga Tufnell), 545  
 Western Electric Fastax High-Speed Motion-Picture Camera (H. J. Smith), 77  
 Whales (Whalebone) : The Southern Stocks of (Dr. N. A. Mackintosh), review by F. C. Fraser, 569  
 Wheat : Inheritance of Awn Barbing in (P. F. Knowles), 258  
 Hessian Fly Resistance in (W. B. Noble), 465  
 Wheat and Wheat Hybrids : Branched Heads in (Dr. B. C. Sharman), 497  
 Wheat Rust : Inheritance of a Mutation in (T. Johnson and Margaret Newton), 319  
 Wheat Varieties : Reaction of, Grown in Britain to Erysiphe (Dr. S. Ellerton), 776  
 Wheat-Puccinia Relationships (F. S. Thatcher), 28  
 Wheats : Synthesis of New Species of (Dr. Anton Zhebrak), 549  
 Wind and Bird Migration (Dr. Norman H. Joy), 135  
 Wöhler's 'Synthetic' Urea and the Rejection of Vitalism—a Chemical Legend (Dr. Douglas McKie), 608  
 Wollaston Fund of the Geological Society awarded to A. G. Brighton, 134  
 Wollaston Medal of the Geological Society awarded to Prof. V. M. Goldschmidt, 134  
 Women with Colour-Blind Relatives (Dr. R. W. Pickford), 409  
 Wood : Cattle Fodder from, 249  
 Transmutation of, 552  
 Wood Preservatives : Testing (J. Leutritz), 441  
 Woodlouse *Armadillidium vulgare* (Latr.) : Reproduction of the (Dr. Walter E. Collinge), 776  
 Wordsworth and Science (Dr. V. B. Wigglesworth), 367, 560 ; (H. A. Scruton), 560 ; (L. C. W. Bonacina), 716  
 Work, the Future of British Industry (Report by the Sub-Committee on Industry of the Conservative Central Committee on Post-War Problems), 355  
 World We Mean to Make and the Part of Education in Making It (Dr. Maxwell Garnett), review by Prof. R. A. C. Oliver, 775  
 World : Planetaria of the (Roy K. Marshall), 191, 616  
 Poisonous Reptiles of the (Doris M. Cochran), 135  
 World (Modern) : Religion, Science and Society in the (A. D. Lindsay), review by F. Ian G. Rawlins, 150  
 World (New) : Invasion of the, by *Anopheles gambiae* (Dr. John Smart), 765

- World (New) and Far East : Early Spanish Possessions of the, review by Dr. J. N. L. Baker, 299
- World (Post-War) : Science and Technology in the, 502
- World Order (New) : Science in the, 63
- World State : Education and the, review by Prof. R. A. C. Oliver, 755
- World Student Relief (James L. Henderson), 152
- Women's Health in War-time, 77
- Wound Dressings : Red Blood Cells as (J. J. Moorhead and L. J. Unger), 340 ; (T. H. Seldon and H. H. Young), 340
- Wounds (War) : The Use of Penicillin in Treating (Medical Research Council War Memorandum No. 12), 767
- X**-RAY Analysis in Industry (X-Ray Analysis Group of the Institute of Physics conference on), 51, 533
- X-Ray Crystallography of Gliotoxin (Dr. D. Crowfoot and B. W. Rogers-Low), 651
- X-Ray Divergent-Beam Photography as a Test of Crystal Perfection (Dr. Kathleen Lonsdale), 433
- X-Ray Photography : Divergent-Beam (Dr. Kathleen Lonsdale), 22
- X-Ray Powder Photographs : Detection of the  $K\alpha$  Satellites on (Mme. Margaret C. M. Farquhar and Miss Adrienne R. Weill), 56
- X-Rays on Erythrocytes Irradiated *in vitro* : Effects of (Dr. L. Halberstaedter), 683
- X-Rays on the Movements of Larvæ and Pupæ of Mosquitoes : Immediate Effect of (G. Goldhaber and B. Feldman-Muhsam), 528
- Xylem Vessels of Monocotyledon Roots : Multiperforate Plates in (B. C. Kundu), 58
- Y**EAST (Baker's) : Effect of Carbon Dioxide and Carbon Dioxide Fixation in (Dr. Knut M. Brandt), 343
- Yeast (Ordinary Baker's) : Formation of Hydrogen Ions in High Concentration by (Prof. E. J. Conway and E. O'Malley), 652
- Yeast Fermentation (Short Period) : Nature of the Cation Exchanges during (Prof. E. J. Conway and E. O'Malley), 555
- Yellow (Blue and) : Visibility of (Prof. H. Hartridge), 775
- Yorke (Warrington) Memorial Fund, 521
- Young People's Colleges : Youth Leaders and Teachers in, 629
- Youth Leaders : Teachers and (McNair Report on), 601, 629, 663
- Youth Leaders and Teachers in Young People's Colleges, 629
- Z**ODIACAL Light : Origin of the (V. G. Fessenkoff), 114
- Zoological Teaching in Trinity College, Dublin : Centenary of (Prof. J. Brontë Gatenby), 723
- Zoology : Relation of, to the War Effort (J. Breukelman), 583



76 1011

BIBLIOTEKA  
Instytut Techniczny  
Uniwersytetu  
we Wrocławiu

# NATURE

*"To the solid ground  
Of nature trusts the Mind that builds for aye."—Wordsworth*

Vol. 153, No. 3872

SATURDAY, JANUARY 15, 1944

ONE SHILLING & SIXPENCE

## NEWTON INSTRUMENTS

Although our production resources are very largely occupied by National demands, we are servicing, as far as possible, existing Newton equipment, and maintaining a limited supply of new instruments

ESTABLISHED **NEWTON & CO. LTD.** Telephone:  
OVER Manufacturers of Optical Lanterns WELBECK  
200 YEARS and Slides 4131  
**72 WIGMORE STREET, W.1** (a line)



**CHANCE-PARSONS OPTICAL GLASS**  
Optical glass plates with the edges polished preparatory to inspection  
**PLATES AND MOULDED BLANKS FOR PRISMS AND LENSES OF FINEST OPTICAL QUALITY**  
UNWORKED COLOURED GLASS FOR CONTRAST FILTERS  
SEXTANT SHADE GLASSES · DIDYMIUM AND URANIUM GLASS  
**CHANCE BROTHERS LIMITED** SMETHWICK · BIRMINGHAM



ESTAB. 1765

## URGENTLY WANTED

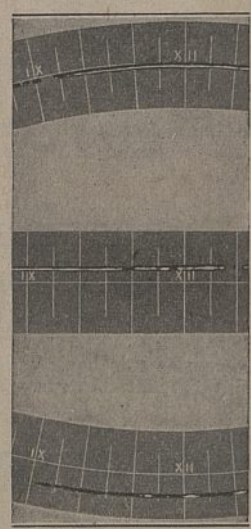
MICROSCOPE OBJECTIVES and OPTICAL ACCESSORIES, also EPISCOPES and EPIDIASCOPES

You can help the war effort by releasing the above unwanted apparatus, which is urgently required by many firms engaged on work of national importance. We will promptly pay good cash prices for modern instruments.

### ACT TO-DAY

If articles are sent from a distance, see they are carefully packed.

**C. BAKER, 244 High Holborn, LONDON, W.C.1**  
Member Scientific Instrument Manufacturers' Assn. of Gt. Britain



## Sunshine

records from the "Campbell-Stokes" Sunshine Recorder

Particulars on request

**NEGRETTI & ZAMBRA**  
122 REGENT STREET  
LONDON - W.1

# OXFORD BOOKS

## THE CHEMICAL ASPECTS OF LIGHT

By E. J. BOWEN 12/6 net

'Lecturers and students will be grateful to Mr. Bowen for writing a book of which the need has been apparent for so long. In presenting a complete outline of the present state of our knowledge of the interaction of light and matter, the book will also be valuable to the non-specialist and the advanced student, whose sense of perspective is liable to be obscured by detailed study of parts of the subject.'

—*Nature*

## MODERN THEORIES OF ORGANIC CHEMISTRY

By H. B. WATSON *Second Edition 1941* 17/6 net

Since the first edition appeared in 1937 a great deal of new evidence has become available and Dr. Watson has included this in the second edition, which is much enlarged and has been entirely reset. 'A most readable book.'—Dr. J. KENYON in *Nature*

## ACID-BASE CATALYSIS

By R. P. BELL 12/6 net

'It is certain that no one else could write a better book on Acid-Base Catalysis.'

—*Transactions of the Faraday Society*

'Should be in the hands of every chemist whose work touches upon it.'—*Chemical Age*

## THE KINETICS OF CHEMICAL CHANGE

By C. N. HINSHELWOOD 15/- net

'The treatment of the subject in the present volume is by far the most satisfactory and interesting that has yet been written.'—Professor ERIC K. RIDEAL in *Nature*

## VOLES, MICE, AND LEMMINGS

Problems in Population Dynamics

By CHARLES ELTON 30/- net

'Mr. Elton should find many readers; his subject, many students. It is, in the strict sense of the adjective, a fascinating subject, giving scope for technical knowledge of many disciplines.'

—*British Medical Journal*

'The publication of this book constitutes an important contribution to a phase of ecology in which Elton has pioneered and of which he is the leader.'—*Canadian Field-Naturalist*

## A NATURALIST ON RONA

Essays of a Biologist in Isolation

By F. FRASER DARLING *Illustrated* 7/6 net

'It would be hard to overpraise this book as literature or as a contribution to our knowledge of the wild life of our coasts and the seas that surround these coasts.'—*Time and Tide*

# OXFORD UNIVERSITY PRESS

# MOBILE PUMPING UNITS FOR VACUUM OR PRESSURE



These units, which supply a high vacuum or moderate pressure from several points, were originally introduced by us to meet certain needs for small-scale vacuum or pressure work. Improvements have been made as a result of experience gained and the latest types are the most efficient and inexpensive available. They are always ready for working, do not obstruct bench space and can be wheeled to any convenient corner after use. Different pumps can be fitted according to individual needs.

*Write for details.*

**W. EDWARDS & CO. (London) LTD.**

*Makers of apparatus for the Production, Utilization and Measurement of High Vacuum*

**KANGLEY BRIDGE ROAD, LOWER  
SYDENHAM, LONDON, S.E.26**

'Phone: SYDenham 7026

'Grams: Edcohivac, Phone, London

## STEREOGRAPHIC SCALE

With the aid of this inexpensive device many problems usually left to the expert—such as correct orientation, duration of sunlight, determination of time, distance and true bearing between one point and another on the earth's surface, identification of stars—can be solved by plane geometry in simple constructions on ordinary paper, the method having the special advantage of presenting to the eye a natural diagram of what is given or to be found.

*A descriptive pamphlet arranged and illustrated in such a way as to bring the constructions under a few rules for easy reference will be supplied on application.*

Plain Boxwood 4/6

Celluloid Edged 9/-

Postage in  
Great Britain 3d.

**C. F. CASELLA & CO. LTD,**  
**Regent House, Fitzroy Square, W.1**

*Members Scientific Instrument Manufacturers' Association of Great Britain*

Important Books**TIME BASES (Scanning Generators)**

Their Design and Development ; with notes on the Cathode Ray Tube

By O. S. PUCKLE, A.M.I.E.E.,

Research Department, Messrs. A. C. Cossor, Ltd. ; Fellow and Member of Council of Television Society.  
Demy 8vo. xii + 204 pages. 124 figures. **16s. net**

Foreword by E. B. MOULLIN, M.A., Sc.D., M.I.E.E.  
REPRINTING—READY SHORTLY

**ISOMERIZATION OF PURE HYDROCARBONS**

By G. EGLOFF, G. HULLA and V. L. KOMAREWSKY

9 × 6. 499 pages. Numerous figures and tables.

**54s. net**

**OUR NATURAL RESOURCES AND THEIR CONSERVATION**

SECOND EDITION

By A. E. PARKINS and J. R. WHITAKER

9 × 6. xiv + 647 pages. 119 illustrations.

**30s. net**

**MAP READING AND AVIGATION, An Introduction**

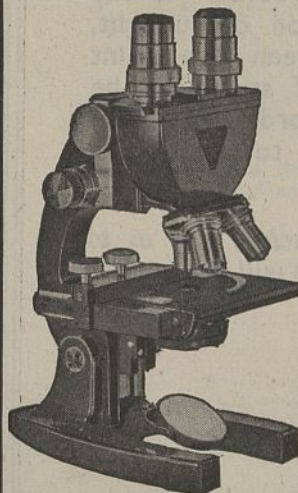
By R. M. FIELD, Princeton University, and H. T. STETSON, Mass. Inst. of Technology.

Demy 4to xiii + 129 pages. 84 illustrations.

**15s. net**

CHAPMAN & HALL, LTD., 11, HENRIETTA STREET, LONDON, W.C.2

*Bausch & Lomb*

**BINOCULAR  
LABORATORY MICROSCOPES**

Confidence in an instrument increases efficiency.

The full guarantee given with all B. & L. microscopes gives you this confidence.

They are optically and mechanically dependable.

**Bausch & Lomb Optical Co. Ltd.**  
Africa House  
KINGSWAY LONDON, W.C.2

**WE APOLOGISE**

if we are unable to meet your requirements at the present time, but feel sure you appreciate we are sending our **PRECISION BALANCES** where the need is greatest.

Later, you will once again be able to get **BALANCES**, of Improved Design and Finest Craftsmanship, from

**William A. Webb, Ltd.**

4 & 5, SKINNER STREET  
LONDON, E.C.1

# NATURE

No. 3872 SATURDAY, JAN. 15, 1944 Vol. 153

## CONTENTS

	Page
Science in the New World Order . . . . .	63
Life and Mentality of the Chimpanzee. By Dr. S. Zuckerman, F.R.S. . . . .	65
The Study of Morale. By Dr. Joseph Geoghegan . . . . .	66
Fluctuation in Animal Populations. By Dr. B. P. Uvarov . . . . .	66
An Unscientific History of Scientific Thought. By Sir H. Spencer Jones, F.R.S. . . . .	67
Language in the Making. By Capt. T. H. Hawkins . . . . .	68
Chemical Aspects of the Visual Process. By Dr. R. A. Morton . . . . .	69
Statistics in Sedimentary Petrology. By Dr. P. Allen . . . . .	71
Obituary : Dr. H. D. S. Honigmann. By Dr. Otto Lowenstein . . . . .	74
News and Views . . . . .	74
Letters to the Editors : Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and Foam consisting solely of Liquids.—Prof. Carl Benedicks and Per Sederholm . . . . .	80
Interpretation of Patterson Diagrams.—Prof. G. Hägg . . . . .	81
A New Type of Microphotometer.—R. W. Pringle . . . . .	81
Meiosis of a Triple Species Hybrid in <i>Gossypium</i> .—S. G. Stephens . . . . .	82
Development of Gametocytes from Extra-erythrocytic Forms in <i>Plasmodium gallinaceum</i> .—Prof. S. Adler and I. Tchernomoretz . . . . .	83
Effect of <i>p</i> -Amino-Benzoic Acid on the Toxicity of <i>p</i> -Amino-Benzene-Sulphonamide to Higher Plants and Fungi.—Dr. P. W. Brian . . . . .	83
Mathematics of Biological Assay.—Eric C. Wood . . . . .	84
Relation between Dissonance and Context.—Dr. R. W. Pickford . . . . .	85
Future of Quaternions.—Prof. W. Peddie . . . . .	85
Society of Agricultural Bacteriologists . . . . .	86
Measurement of Hearing and Deafness . . . . .	87
Statistical Methods for Government Departments . . . . .	88
A Gas-Tube Harmonic Generator . . . . .	89
Biological Results of the Last Cruise of the <i>Carnegie</i> . . . . .	89

Editorial and Publishing Offices

MACMILLAN & CO., LTD.,

ST. MARTIN'S STREET, LONDON, W.C.2.

Telephone Number : Whitehall 8831

Telegrams : Phisus Lesquare London

Advertisements should be addressed to

T. G. Scott & Son, Ltd., Talbot House, 9 Arundel Street, London, W.C.2

Telephone : Temple Bar 1942

The annual subscription rate is £4 10 0, payable in advance. Inland or Abroad. All rights reserved. Registered as a Newspaper at the General Post Office

## SCIENCE IN THE NEW WORLD ORDER

THE special meeting of the Royal Society held in India on January 3, was the occasion of a message from the Prime Minister to scientific workers which should be given wide publicity. It will be remembered that, at the anniversary meeting of the Royal Society on November 30, Sir Henry Dale referred in the course of his presidential address to the visit to India of Prof. A. V. Hill, and to a proposed special meeting of the Society to be held in that country at which Prof. Hill would be able formally to admit to the Society those Indian fellows who had not hitherto been able to sign the Charter Book. The meeting took place on January 3. On that day, in the hall of St. Stephen's College, Delhi, the Indian Science Congress Association opened its annual meeting. The inaugural ceremony was preceded by a short address by Prof. Hill, who declared the great gathering to be a meeting of the Royal Society. Dr. H. J. Bhabha and Sir Shanti Bhatnagar were duly admitted and subscribed to the fellow's obligation on a sheet of parchment to be included later in the Charter Book.

With that simple ceremony, this short special meeting of the Royal Society was brought to a close; but it is safe to predict that it will long be remembered in scientific circles in India and elsewhere. H.M. the King, as Patron of the Society, was represented by His Excellency the Viceroy, who afterwards delivered an address. Prof. Hill himself reminded his audience that this was the first occasion on which the Royal Society had held a meeting outside England, and that its purpose was to convey the greetings and goodwill of the Society to the scientific workers of India. He quoted from a letter by Sir Henry Dale to the president of the Indian Science Congress Association, suggesting this special meeting, in which Sir Henry said: "There is a general desire among the men of science in Britain for a more intimate collaboration with those in India who are working for the advancement of knowledge in the same fields of research", and concluding by expressing the hope that Prof. Hill's visit "will strengthen the bonds of understanding and true comradeship between Indian and British men of science".

The same notes of greeting and comradeship sounded in messages sent to Prof. Hill on the eve of his departure for India. Sir Richard Gregory, president of the British Association, the sister body of the Indian Science Congress Association, said that the "place of a country among the nations of the world to-day depends on the extent to which use is made of its resources in men and material. . . . The mission of science is the discovery of truth, to whatever consequences it may lead. The urgent duty of scientists to-day is to ensure that the message is interpreted rightly for the good of mankind." General Smuts also referred to the paramount importance of scientific research in relation to industry, agriculture, war and in other directions; and he continued, "In the great forward movement of India in our day, which is so universally acclaimed, there

is nothing more outstanding than the part her sons are taking in science and scientific research, and some of the most notable advances in physics, mathematics and the biological sciences have come from Indian workers."

Finally, Prof. Hill read the following message from the Prime Minister:

"I am very glad to have the opportunity to send through you my greetings and good wishes to Indian men of science and especially to the six Indian Fellows of the Royal Society, of which I am honoured to be myself a Fellow. It is the great tragedy of our time that the fruits of science should by a monstrous perversion have been turned on so vast a scale to evil ends. But that is no fault of science. Science has given to this generation the means of unlimited disaster or of unlimited progress. When this war is won we shall have averted disaster. There will remain the greater task of directing knowledge lastingly towards the purposes of peace and human good. In this task the scientists of the world, united by the bond of a single purpose which overrides all bounds of race and language, can play a leading and inspiring part."

There should be cause for deep satisfaction to scientific workers in these words from Mr. Churchill, because they carry a significance far beyond the occasion for which they were written. It is a truism to state that the fruits of science have been misused, and that on a vast scale. They have been misused in the past; each new discovery seems to have been matched with an evil mind ready to turn it to personal advantage at the cost of human suffering, until with the present War we have reached a climax. But, the Prime Minister goes on, "that is no fault of science". These words should be proclaimed throughout the world. Year in and year out, scientific men have been at pains to show by the written word and otherwise that scientific research is the search for truth and for the understanding of the workings of Nature, and in these columns we have continually striven to drive home their arguments. So far as men of science were concerned, we were in large measure 'preaching to the converted'; but the continued lack of appreciation of the position among those who had not had training in scientific methods justified the effort.

With the increasing utilization—intrusion some have called it—of science in industry, transport, agriculture and practically every other phase of human activity witnessed during the twentieth century, there has been a growing tendency to put the blame for every man-made disaster, from wars downwards, on science. Both the War of 1914-18 and the present War have been notorious for the use that has been made of science for destructive purposes.

In consequence, there is still a widespread feeling among laymen that science is always and everywhere an agent of destruction, and its great gifts to mankind are overlooked or forgotten. If anyone doubts this, let him study the correspondence printed in the daily Press, or take the views of the generation now serving in the Armed Forces, on whom the build-

ing of the new world order will depend. When confronted with a modern development such as the aeroplane, it is perhaps not to be wondered at that the superficial observer may think only of the destruction that has been wrought by man's misuse of this wonderful means of transport, by means of which even the natural barriers imposed by the physical features of the earth's surface can be surmounted quickly and comfortably. The spate of propaganda that has been spilled over the world since radio-telephony became possible has made it easy to forget that broadcasting could be used equally well to bring the nations together through the exchange of cultural knowledge. 'War gases' is a common phrase, on which the comment, so well known to scientific men, that not one of the gases used or suggested for this purpose was discovered in the course of investigations directed to this end, cannot be too often repeated. Under the stress of war, little thought is given to the relief of suffering brought about by the discovery of insulin, the sulphur drugs and now penicillin, except in relation to war injuries.

The examples could be multiplied almost indefinitely, as every scientific worker knows; what he does not realize clearly enough is that the general public still requires instruction. In spite of the growth of science teaching in schools, the young people of to-day, unless they happen to be interested professionally in science, seem incapable of seeing the scientific facts they acquired at school as parts of the larger problems of modern life; their education is clearly incomplete. Here scientific workers can play a useful part; for although we cannot at present prevent man from utilizing science for destructive purposes, we can at least attempt to make him see the folly of ignoring the gifts that science offers as contributions to his happiness and welfare. Every man of science should regard himself as a prophet of the scientific era, working actively for a better understanding of the meaning of science and scientific discovery among his fellow-men.

But the Prime Minister did not stop at the exoneration of science from the blame for wars. He pointed to the future, and to "the greater task of directing knowledge lastingly towards the purposes of peace and human good". In the new world order towards which the United Nations are striving, science will be of increasing importance. To fulfil the letter and the spirit of the Atlantic Charter, great stores of knowledge about the resources of the world must be gathered in, classified and utilized with due regard to the many human factors involved. In doing this, every conceivable branch of science will be involved, and men of science of all nations, acknowledging in their work only an allegiance to the search for truth, can, in the words of the Prime Minister, "play a leading and inspiring part" in the building up of a stable civilization.

Mr. Churchill's brief message will inspire scientific men to attack the innumerable problems awaiting them during the War and afterwards with redoubled vigour and a new confidence that their work will not be in vain.



## LIFE AND MENTALITY OF THE CHIMPANZEE

### Chimpanzees

A Laboratory Colony. By Prof. Robert M. Yerkes. Pp. xv+321+63 plates. (New Haven, Conn.: Yale University Press; London: Oxford University Press, 1943.) 33s. 6d. net.

CHIMPANZEES are scarcely common experimental animals. In so far as they have been investigated under laboratory conditions at all, the credit is very largely due to Prof. R. M. Yerkes, until lately in charge of the Yale Laboratories of Primate Biology. It was Prof. Yerkes's insistent belief in the necessity for studying these near-human animals, and his patience in stating the case, that finally resulted in the munificent endowment by the Rockefeller Foundation of laboratories in New Haven, Connecticut, and of an anthropoid experimental station in Florida. As fast as the material facilities grew, research students were attracted. Their work over the fifteen years or so that the laboratories have been in operation forms the subject-matter of a large number of papers dealing with anthropoid psychology and physiology. Yale proved very fruitful soil for such investigations. Side by side with Prof. Yerkes's department there grew up, under Prof. J. F. Fulton, another department which is mainly concerned with the study of primate physiology, and in particular with the study of neurological mechanisms in apes and monkeys. A little later Prof. Edgar Allen joined the band, and developed in the associated department of anatomy a wide field of research into the reproductive mechanisms of Rhesus monkeys—a field which was also being covered by Dr. G. Van Wagenen in a neighbouring laboratory. These three laboratories, housed more or less under the same roof, have in the past fifteen years been the world-centre for studies of primate biology. Prof. Yerkes has only recently come to the end of his term as head of the laboratory he founded. Under the tutelage of its new director, Prof. Lashley (one of the foremost world-authorities on psycho-physiology), the future of the department is more than assured.

Prof. Yerkes has given students of primate biology a number of comprehensive works on the behaviour of apes. The best known is his reference book "The Great Apes", a compilation of all recorded observations on the lives of these animals. In his new book "Chimpanzees: a Laboratory Colony", he does not provide a general account of knowledge about chimpanzees since, as he puts it, his book is neither comprehensive nor historical; nor does he provide an epitome of studies made in the laboratories under his directorship. What he has given us is an excellently illustrated book, written primarily from personal experience and from a personal point of view, which records various facts relating to the general behaviour, social behaviour, mentality and handling of chimpanzees in captivity.

The book opens with a brief account of the natural habitat of chimpanzees and with a statement about the means by which they are captured and the uses to which they are put in captivity. Then comes a general description of their mercurial changes in attitude and behaviour and of their different temperaments and individualities. The chapter which follows is a somewhat more detailed account of social interactions between ape and ape. This is succeeded by a careful record of the growth phases and repro-

ductive physiology of the chimpanzee and of sexual relationships. All this constitutes Part 1 of the book. Part 2 is devoted to the subject of chimpanzee mentality. Perceptual capacities, ideational behaviour, learning, memory and symbolism are each discussed in detail. Part 3 is a unique statement of the best ways to house, feed and breed the animals under laboratory conditions. The material it incorporates has never before been put together in so useful a form, and it should prove of immense value to other students of primate biology.

Two central themes which Prof. Yerkes deals with at length are the part played by the striving for dominance in the social lives of these animals, and the level of their mental evolution. Dominance is defined in terms of the dominant individual—"one who takes priority of response over its companion and is able to satisfy its needs, desires, or whims to the total or partial exclusion of another's rights". This characteristic develops in childhood and is, as Prof. Yerkes shows, a major, almost the major factor in the life of the mature animal. Prof. Yerkes is, however, inclined to regard the principle of dominance not so much as placing a premium on selfishness but as an insurance against individual ineffectiveness. Whether dominated animals would take the same view, or be assuaged by the occasional instances in which a dominant ape shows kindness, could only be answered by the animals themselves.

Prof. Yerkes indicates that chimpanzees can be trained to act co-operatively in a task the reward of which is, say, a piece of fruit—although in such situations the animal of "superior social status will try to encourage and direct the assistance of its subordinate companion and also do its best to monopolize the reward". In Nature almost the only truly co-operative activity of chimpanzees is mutual grooming. All this leads Prof. Yerkes to define the outstanding social characteristics of the species as "infantile social dependence, with its urge to cling; childish social attachment, with its insatiable craving for companionship; and adolescent or mature dominance, with its persistent drive for social status—a higher place in the social hierarchy". This is a very fair statement of the position.

The drive for dominance in general puts the male above the female socially. Scales of dominance, however, are not permanent. When a female is on heat and sexually desirable she becomes less subordinate—largely through what may be generally described as sexual prostitution. "The mature and sexually experienced female trades upon her ability to satisfy the sexual urge of the male. Sexual accommodation is or may be habitually exchanged for such material or personal advantages as the possession of food, desired objects, comfortable quarters, opportunity for initiative, leadership, or freedom of action". In all this the chimpanzee appears to behave in very much the same way as the baboon.

In 'mentality' and the ability to deal with experimental problems, the chimpanzee appears, however, to be superior to baboons and other monkeys, although fundamentally, as Prof. Yerkes writes, there are no "significant contrasts" in their behaviour. Essentially chimpanzees differ from monkeys in their "readiness and degree of response to training, general adaptation to experimental and other requirements, ability to learn to co-operate with each other or with Man".

The mental gulf between chimpanzee and man is, of course, much wider than that between chimpanzee and monkey. For no amount of similarity in funda-

mentals of behaviour can make up for the ape's lack of articulate speech and symbolic processes.

Prof. Yerkes's book is a great achievement and a rich contribution to the literature of the Primates. Students of the subject once again stand deeply in his debt.

S. ZUCKERMAN.

## THE STUDY OF MORALE

### The Structure of Morale

By Dr. J. T. MacCurdy. Pp. vii+224. (Cambridge: At the University Press, 1943.) 8s. 6d. net.

**I**N the speaking and writing on current problems of which there is to-day such an increasing spate, discussion of values of a non-material nature frequently introduces the use of the word 'morale'. It is then employed in a loose, indefinite fashion to cover a diversity of meanings. A serious study of the whole subject by a writer of standing, qualifications and experience comes very apt to the moment.

Warren, in his "Dictionary of Psychology", allows the more general application of the term to the attitude of the group, though permitting its use in speaking of the individual, and considers that it marks the degree of confidence, perseverance in work, and adherence to ideals. The behaviour of man as a human being has long since ceased to be that of an isolated unit and to an increasing extent become that of a member of a community. According to McDougall, the positive side of the group spirit depends on the existence in the mind of each component of a clear knowledge of the group, of his place in it, and of a sentiment of devotion to it. It is important to recognize that there is an inward source of authority based on the herd instinct, leading to social cohesion and co-operation.

Dr. MacCurdy is a university lecturer on the subject of psycho-pathology; called upon in the earlier days of the War to lecture on problems of morale to selected personnel, he has wisely chosen to be practical, concrete and direct rather than theoretical and discursive. Discussion of the multiple facets of this subject has required some explanation of the common psychological urges with particular reference to the group-mind and the implications of the part played by the herd instinct in the feeling, thinking and willing of mankind. To do so he has, of course, had to cover elementary ground, to re-state the trite and to enlarge the commonplace. But Dr. MacCurdy is never dull; he always has an appositeness of remark and a convergent simplicity interesting to the informed and instructive to the ordinary man.

This very broad approach is dealt with systematically by the author. First of all he gives some attention to the place of the individual, and has taken for this purpose the nature and effects of fear. He explains the factors incident upon the individual in his dual reactions as a unit and as a member of a community, showing neatly how a man can be both frightened and brave at the same moment. Stress is rightly laid on the identification of the self with the ideal of the group, the striving urge in this direction, and the increasing pride, nay pleasure, in the acceptance of another and higher responsibility.

Perhaps the most attractive chapters in the book come in the second section, which deals with the basic principles of social life. It is to be remembered that the feelings seeking expression in the face of any given event are not the mere outcome of a momen-

tary impulse; they represent the focus, the apex, of a wealth of interlocking, often contradictory factors stretching far back into the heredity and history of the individual. All sorts of influences—education, tradition, climate, geography, health, contacts, etc.—provide threads reaching down to and governing the immediate response. In considering all these qualities involved in the make-up of morale, Dr. MacCurdy is able to discuss the variables, such as national and religious sentiments, different scales of values, loyalties, leadership, moralities and so on. He has some very apposite remarks to make on the growth and development of national differences and tendencies in this respect, cultivated and shown consciously or not. Though he is quite ready to criticize details of our own national traits and aspirations, it is satisfying to find that he is able to come to a dispassioned judgment against the fundamentals of the German.

That confidence in the outcome which is a constituent part of morale depends very largely upon the feeling about the organization behind the effort. This again in many if not all of its details has implications of importance. In the third section of his book Dr. MacCurdy takes up the various aspects coming under the head of organization, liaison, departmentalism, caste, science and its place, democracy, dictatorships, public service: many, in short, of the difficulties inherent in the mere necessity of some sort of co-ordination for mutual and common ends. He is thus able to separate out and dissect in detail, but always in relation to the common factor, the multiple problems involved in our relations with our fellow-men calling for collective and accepted arrangement.

The "Structure of Morale" is a sound and competent piece of work. Written by a man of special experience and opportunities, it succeeds, though dealing largely with subjects of a strong technical flavour, in explaining with clarity and instructing with interest upon the changing values of a changing world. It is full of common sense and clear thinking. It will be read with advantage by everyone, from chief executive to railway clerk, who has any vision for things beyond the close horizon of his petty personal interests. Even these are involved, for they can never be quite disentangled from what R. L. Stevenson has so aptly called "a municipal fitness".

JOSEPH GEOGHEGAN.

## FLUCTUATION IN ANIMAL POPULATIONS

### Population Dynamics and Adaptive Evolution of Animals

By S. A. Sewertzoff. (In Russian.) Pp. 316. (Leningrad: Academy of Sciences U.S.S.R. Moscow, 1941.) 11 roubles.

**P**ROBLEMS of fluctuation in numbers in animal populations are of direct interest both to those concerned with the exploitation of natural animal resources (fish, game, fur-bearing animals), and to students of evolution. Theoretical research on these problems is visualized by the author mainly as investigation of facts illustrating the Darwinian theory of the struggle for existence. According to him the overwhelming importance of the struggle for existence is overlooked by the majority of theoretical biologists, and this accounts for the spread of such idealistic theories as hologenesis, Lamarckism, nomo-

genesis, etc., while a tendency to ignore Darwinian ideas is characteristic of 'bourgeois science'. Such a view of Western biology may cause some surprise, as it is scarcely justified by the modern trends in its development, which appear to have remained largely unknown to the author. In fact, when discussing evolutionary theories later in the book, he directs his polemics against O. Abel and Beurlen, neither of whom can be called very modern, or typical of Western science.

The first part of the book is introductory and contains a review, which is not very up to date, of the basic principles of population dynamics, such as the curves of population growth; specific constants of reproductive ability; longevity curves; etc. The second part, occupying nearly half the book, is the most interesting one, as it comprises detailed analyses of fluctuations observed in populations of various game birds and animals, mainly in the Gatchina game reserve, where exact records of the game bred and shot have been kept for twenty-five years (1884-1909). Other data are those on the dynamics of the bison and other game in the Bialowiezh forest in the period 1809-1916; of the seal population in the Pribyloff and the Komandor islands in 1912-1932; of wolves in Central Russia in 1917-1924; of squirrels in 1891-1908; of hares in Russia in 1825-1898; of voles and other rodents; etc.

The third part is closely linked with the second, as it is given to the discussion of the theories of population dynamics. The curves of increase in populations and of mortality of every species are, according to the author, as characteristic of the species as its morphology or physiology. Fluctuations in populations are due to a gradual increase, regulated by the action of predators, which, however, can only influence the length of the cycle but are never able to overtake the increase in the population of the prey, and thus to cause the collapse of a cycle. The collapse is always sudden and is usually caused by an epizooty, in the spread of which the density of the population is a most important factor; in less frequent cases, the collapse may be due to a climatic catastrophe. This sudden reduction in the prey population causes a reduction in the number of predators due to lack of food, and this makes a new increase of the prey possible. The author's theory, therefore, only partly coincides with those of Volterra and of Elton; a possible direct correlation between population cycles and climatic cycles is rejected by the author, practically without argument.

The fourth part, entitled "Ecology and the Evolution Theory", begins with an attempt to analyse the facts of population dynamics against the background of the Darwinian struggle for existence, and the well-known conceptions of life-form, ecological niche, biotic potential, etc., are discussed. This leads the author to consider the evolution of species in their relations to environment, but instead of analysing this problem with concrete ecological data, he transfers the discussion to the question of adaptations, not of individual species, but of large phyletic groups, and many pages are devoted to Osborn's and A. N. Sewertzoff's theories of adaptive radiation and evolution. This chapter is followed by one dealing with the problem of longevity and mortality in different groups, and a conclusion is reached that long-lived species are less fertile than the short-lived ones, but their mortality is also lower and their numbers less subject to fluctuations. This interrelation permitted the author to develop a mathe-

matical formula showing that the fertility of a species is a logarithmic function of its longevity. The formula has enabled him to construct a series of species of mammals, birds, reptiles and fishes, which make it possible to arrive at definite conclusions with regard to the relative intensity of the struggle for existence in these classes. A special chapter is devoted to checking the general conclusions on mammals; the evolutionary history of the class is recapitulated and found in harmony with the author's theories. In the concluding chapter the author rather suddenly reverts to the practical aspect of the subject and supplies a somewhat sketchy account of the influence of man on populations of wild animals, and also points out the importance of a knowledge of the laws of population dynamics for those concerned in fisheries, game-keeping, etc.

The book leaves a very mixed impression. Its purely ecological chapters are most interesting because of the author's dynamic approach and his masterly dialectical analysis of a mass of valuable data from Russian sources, but his attempt to justify the life-long morphogenetic and phylogenetic work of his brilliant father, A. N. Sewertzoff, by its somewhat remote connexion with purely practical problems, appears scarcely necessary. Unusual features of the book are an almost complete lack of reference to the genetic aspect of population dynamics and of evolution; and repeated protestations of the Darwinian orthodoxy of the author's views. The bibliography is rich in Russian references of great value to ecologists and population students, but there are no references to publications in other languages after 1937.

B. P. UVAROV.

## AN UNSCIENTIFIC HISTORY OF SCIENTIFIC THOUGHT

From Copernicus to Einstein

By Hans Reichenbach. Translated by Ralph B. Winn. Pp. 123. (New York: Philosophical Library, Inc., 1942.) 2 dollars.

ON the jacket of this book the publisher states that "this is a simple but scientific history of ideas and discoveries that have led to the formulation of the theory of relativity. . . . The wealth of ideas contained in it tend to make it a distinguished contribution to scientific thought. It is well illustrated with charts and diagrams. The book is especially intended for the scientific as well as amateur astronomer and physicist." The reader will soon discover that these statements are quite unjustified; that the book abounds with erroneous statements, that the historical perspective is often wrong, that the wealth of ideas is conspicuous by its absence and that the translation is so bad that it is sometimes impossible to understand what is meant. The illustrations consist of eleven crude diagrams.

In the first few pages, for example, views are ascribed to Ptolemy that are much earlier in point of time. The author states that the "De Revolutionibus" of Copernicus appeared in 1546, after the death of Copernicus, and that Copernicus read the proofs on his death-bed; Copernicus never saw the proofs, and the book appeared in 1543, a copy reaching him a few days before his death. It is not correct that "the Copernican theory offers a very exact calculation of the apparent movements of the planets", nor that this was one of the reasons that led to its accept-

ance; Copernicus himself said that he would be delighted if he could make his theory agree with observation within 10'. It is not true that Copernicus was able to break with an old belief "only because he had at his disposal a considerable amount of accumulated scientific thought and scientific data". The statement that with the astronomical instruments of to-day angles can be measured "within one hundredth of a second of the arc" shows a lack of appreciation of the errors of observation. It is not correct to state that Copernicus "was of the opinion that the solar system virtually exhausted the space of the Universe"; Copernicus asserted that the stars were at an immense distance, but left the question whether the world was infinite and without bounds for philosophers to discuss.

The account of the work of Tycho Brahe and Kepler is misleading. Kepler was able to prove that the orbits of the planets are elliptical because Tycho had not restricted his observations of the planets, as his predecessors had done, mainly to the times near opposition, but had observed them right round the heavens; this is not mentioned. The statement that Kepler "discovered through mere measurement also other laws of planetary motion, called after him 'the Kepler's laws'" gives a poor idea of Kepler's long and laborious investigations. It is not correct that to Copernicus and Kepler the stars "were tiny dots in the sphere of heavenly matter". Giordano Bruno was not the first person to assert that the firmament was infinite; this was stated by Thomas Digges, from whom Bruno probably adopted the conception. Galileo did not make the first serviceable telescope, and he did not see Venus as a sickle-like shape, but as a crescent. He did not designate the major satellites of Jupiter as the "medizeic planets". To state that he discovered that "all bodies fall equally fast" is inaccurate. The statement that "fate allotted to the English physicist Isaac Newton an outstanding role in the history of the natural sciences of the described period" is a poor tribute to the genius of Newton.

A few specimens of the translation will suffice to show its crudeness. "Electrical waves are advancing fields which should not be regarded as bound to a material medium. They are waves in which electricity continually alternates between positive and negative. Yet they are not dependent on the ups and downs of small material particles, but move quite independently through space. They thus have qualities found by the science of optics in the slow course of experimentation with light." "Such reflections were entertained with regard to ether and in connection with astronomical relations. As light traverses the world's space, ether must fill it like a great mass of water in which [planets float like isles. Insofar as planets move around the sun, they must be characterised by a different state of motion from that of ether. Thus one comes to the assumption that the velocity of light, as measured on a planet like the Earth, must vary with direction, simply because ether is understood as a substratum of light waves and only with regard to it can the velocity of light receive its natural value". "What is maintained by Einstein with regard to light goes, therefore, for all electrical waves of which light is but a representative. But according to our knowledge of the internal structure of all substances, there are basically only two ways of transferring power from body to body; gravitation and the electrical wave. Every other manifestation of force is composed of them. If they both move

with the velocity of light, as Einstein contends, then a slowing up may occur within the atoms of the body, when the power runs in a zig-zag course; but it can never be accelerated. Einstein's law of the limit character of the light-velocity means thus nothing other than a formulation of the fact that light represents one original form of the transfer of action, the other representing an equal speed limit".

The quotations will suffice to show that the book cannot be recommended. H. SPENCER JONES.

## LANGUAGE IN THE MAKING

### The Gift of Tongues

By Prof. Margaret Schlauch. Pp. ix+342. (London: George Allen and Unwin, Ltd., 1943.) 12s. 6d. net.

MARGARET SCHLAUCH is a professor of English at New York University and teaches Chaucer, medieval literature and language. In the "Gift of Tongues", however, she has directed attention to the study of linguistics for the layman. The matter is so varied in style and content that it is difficult to comment on the book as a whole. Generally, it is well written and reads easily; much of the reader's enjoyment comes from a liberal sprinkling of sly humour which never obtrudes. Among the many subjects dealt with by Prof. Schlauch are the early origins of language, the use of names in magic, the evolution of written language through pictographs, ideographs and hieroglyphs to fixed alphabets and the study of semantics.

The possibilities of basic English as an international language is discussed in a chapter dealing with the history of the English language. A section on grammar gives a brief outline of the principles of sentence construction in the Aryan family of languages and then proceeds to show that our own system is, after all, but one system, based largely on Latin. An interesting account of the emotive qualities of words leads on naturally to the use and need of linguistic knowledge in studying some modern poets like James Joyce, Gerard Manley Hopkins, Gertrude Stein, Hart Crane and others whose works are reputed to be 'difficult' because of their deliberate use of verbal distortions, puns, overtones and double shades of meaning. The work of modern poets in using words in their original meanings and free from the impediments which have obscured their original meanings is also considered.

Men of science, as well as Mrs. Malaprop and other *arrivistes* in language, would find much to interest them in the chapter concerned with the social aspects of language and its significance in class, superstition, and politics. In this connexion it is easy enough to agree with Prof. Schlauch that "linguists will gain and give most when they unite the traditional scrupulous regard for scientific method with vivid and realistic awareness of social milieu and its challenging problems. To do this they will have to receive help from, as well as give it to, other disciplines such as sociology and psychology", as well as her further remark that "no part of language study offers better occasion for scientific collaboration than the investigation of meanings against a social back-ground".

The book is thoroughly annotated and contains a well-ordered and lengthy bibliography. The series of questions and illustrations at the end would be useful as diversion for the layman and exercise for the student.

T. H. HAWKINS.

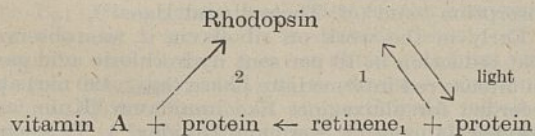
## CHEMICAL ASPECTS OF THE VISUAL PROCESS

By DR. R. A. MORTON

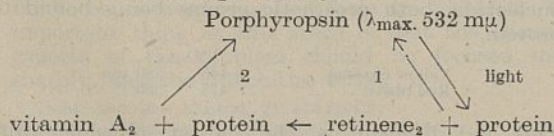
University of Liverpool

THE chemistry of photo-reception remains obscure in spite of a vast literature, particularly rich in biophysical data; indeed it is doubtful whether on the chemical side present theories are more than the merest scaffolding. Recent statements by well-known workers display a confidence about the nature of visual purple (rhodopsin) which it is not easy to share. It is said to be "safe to assume that visual purple is a conjugated carotenoid-protein" (Hecht<sup>1</sup>); rhodopsin "is a conjugated protein with a carotenoid prosthetic group called retinene; it is estimated that one molecule contains 10 prosthetic groups and that each such group contains one molecule of vitamin A" (Mitchell<sup>2</sup>). "Rhodopsin is a rose-coloured carotenoid-protein, in aqueous solution its absorption spectrum consists of a single broad band maximal at 500  $m\mu$ . In light it bleaches in a succession of photochemical and thermal reactions to orange and yellow products, liberating in the process the carotenoid retinene" (Wald<sup>3</sup>). "No doubt, therefore, the A vitamins are of importance for the formation of the chromophoric group of the visual purple molecule, even though it may not be possible at present to describe the nature of this relationship" (Granit<sup>4</sup>).

The existence of retinene was revealed by the work of Wald. It is defined by him as the substance which gives rise to a blue-green colour with chloroformic antimony trichloride, characterized by a sharp absorption band at 664  $m\mu$ . Retinene disappears when intact dark-adapted retinas are illuminated and is replaced by vitamin A ( $\lambda_{\max}$  620  $m\mu$  in the antimony trichloride colour test). The cycle:



plausibly summarizes the role of vitamin A in preventing abnormally slow adaptation to dim light (scotopic vision). The discovery of vitamin A<sub>2</sub>, and of the pigment porphyropsin in the retinas of freshwater fishes, led to the idea of a parallel cycle:

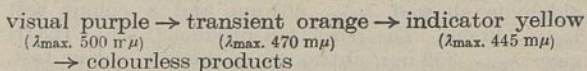


With the antimony trichloride reagent, vitamin A<sub>2</sub> gives a colour with  $\lambda_{\max}$  693  $m\mu$  and retinene<sub>2</sub> a colour with its maximum absorption at 706  $m\mu$ . Direct absorption spectra of solutions containing retinene<sub>1</sub> and retinene<sub>2</sub> reveal maxima at 387 and 405  $m\mu$  respectively, which are plausibly but not conclusively attributed to these substances.

Wald's observations created an interesting and promising situation, but as has happened before in visual purple research, progress appears to have halted. The reason is probably a lack of working hypotheses. No suggestion has been hazarded as to the chemical relationship between the vitamins A and the retinenes. No mechanism has been advanced to account for the conversion of vitamin A ( $\lambda_{\max}$ .

325  $m\mu$ , practically colourless in dilute solution) to the rose-coloured visual purple. No explanation is available of the fact that in studying the photo-decomposition of visual purple solutions, vitamin A could not be found at any stage (Krause and Sidwell<sup>5</sup>, Wald<sup>6</sup>).

Vitamin A, a fat-soluble alcohol C<sub>20</sub>H<sub>29</sub>OH, is not known to form pH-sensitive derivatives: yet visual purple undergoes photo-decomposition to yield a succession of products, all of which are pH-sensitive:



(Lythgoe and Quilliam<sup>7</sup>, Wald<sup>6</sup>).

According to Wald, a succession of changes occurs, and though the spectrum of rhodopsin itself is unaffected by pH changes, the spectra of all stages of bleaching are highly pH-labile. "Rhodopsin apparently does not possess an acidic or basic grouping in close association with its chromophore, but such a grouping is exposed as a first result of irradiation (cf. Lythgoe). The effects of pH change on the absorption spectra of bleached products are in some cases large and peculiar, probably because they involve complicated mixtures of pigments."

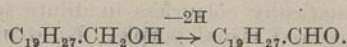
It has been shown that the quantum efficiency of the primary photochemical process in the decomposition of visual purple is about unity and the molar extinction coefficient (at 506  $m\mu$ ) is  $2.3 \times 10^4$  (Dartnell, Goodeve and Lythgoe<sup>8</sup>).

In itself this is scarcely consistent with a 'carotenoid' prosthetic group, since  $\epsilon_{\max}$  is  $5 \times 10^4$  for vitamin A and  $1 \times 10^5$  for  $\beta$ -carotene.

Vitamin A deficiency not only delays dark adaptation in scotopic (rod) vision but also very definitely affects photopic (cone) vision. The duplicity theory is firmly established and vitamin A is concerned in both mechanisms. Nothing, outside the problems of vision, is known about vitamin A or its derivatives to indicate abnormal photo-sensitivity, and the idea that the chromophoric group of visual purple is retinene or any other vitamin A derivative does not compel assent. The chromophoric or prosthetic group may well be entirely different; it may be an unknown or a known substance.

In fact, it has already been suggested that riboflavin (or a related compound), which is known to occur in relatively large amount in the eye, may "take part in the visual processes by means of its photo-chemical properties such as fluorescence and light-sensitivity" (Adler and v. Euler<sup>9</sup>). The photo-chemistry of riboflavin, of its phosphate and of the yellow enzymes is complex; there is a sequence of changes, pH-sensitive and oxygen-sensitive products being formed. "If the flavin of the retina is associated with colour vision, it is thought probable that the change of the flavin to a primary photo-body furnishes the nerve stimulation. The irreversible change of the photo-body to deuterio-riboflavin, which would be a loss of valuable flavin is prevented by O<sub>2</sub> in the retina" (Theorell<sup>10</sup>). That flavin is in some way connected with the visual process seems clear from Pock-Steen's report that twilight blindness in 'leiodystonia' and sprue was alleviated by riboflavin but not by vitamin A. No attempt seems to have been made to reconcile the 'flavin' and 'vitamin A' hypotheses.

Of the possible changes which vitamin A (delivered to the eye via the blood stream as free alcohol C<sub>19</sub>H<sub>27</sub>.CH<sub>2</sub>OH) could undergo, the first to be considered is clearly:



This change is physiologically plausible. Unfortunately, vitamin A aldehyde has not been prepared, although Heilbron and his colleagues<sup>11</sup> tried to make it from the alcohol by the use of Oppenauer's method. Instead, they obtained  $C_{23}H_{32}O$ , probably  $C_{19}H_{27}CH=CH.COCH_3$  ( $\lambda_{max}$ . 401 m $\mu$ , antimony trichloride colour test 646 m $\mu$ ) and  $C_{19}H_{25}CHO$  (one additional double bond in the terminal six-membered ring). The aldehyde showed  $\lambda_{max}$ . 401 m $\mu$  and a colour test  $\lambda_{max}$ . 740 m $\mu$ . The reduction product  $C_{19}H_{25}.CH_2OH$  gave  $\lambda_{max}$ . 359 m $\mu$ , antimony trichloride colour test, 728 m $\mu$ . In attempting to judge whether the retinenes resemble the hypothetical vitamin A or  $A_2$  aldehydes, it is necessary to recall a peculiarity of the colour tests. Vitamin A with antimony trichloride shows  $\lambda_{max}$ . 620 m $\mu$  with a pronounced inflexion near 583 m $\mu$ . Colour-test inhibitors (for example, 7-methyl indole) suppress the 620 m $\mu$  band, and the 583 m $\mu$  maximum is revealed. Similarly, the vitamin  $A_2$  colour test shows absorption maxima at 693 m $\mu$  and 650 m $\mu$  under certain conditions. The ease with which vitamins A and  $A_2$  can be made to exhibit either of two maxima in the colour test at once raises the question whether the observed maxima for retinene<sub>1</sub> and retinene<sub>2</sub> are respectively comparable with the longer or shorter wave-length maxima:

	$\lambda_{max}$ , m $\mu$	Antimony trichloride colour test maxima
Vitamin A <sub>1</sub> .. .. .	325	620 and 583 m $\mu$
Vitamin A <sub>2</sub> .. .. .	350	693 and 650
Retinene <sub>1</sub> .. .. .	387	664
Retinene <sub>2</sub> .. .. .	405	706
$C_{19}H_{27}CH=CH.COCH_3$ .. .. .	401	646
$C_{19}H_{25}CHO$ .. .. .	401	740
$C_{19}H_{25}CH_2OH$ .. .. .	359	728

Two points emerge: first, the importance of preparing vitamin A aldehyde; and second, the need for a full study of the colour test. The ultra-violet maximum for the aldehyde might be expected to fall near 360-370 m $\mu$ .

I have observed a 664 m $\mu$  chromogen (a) in extracts from aged processed human blood plasma and (b) in a fraction from bovine serum. In both cases the chromogen was probably an artefact. It has also been obtained by the oxidation of pure vitamin A but much contaminated with other products. Optimum conditions are elusive, but three workers (T. W. Goodwin, R. H. Creed and myself) have repeatedly seen the band, using  $CrO_3$  or  $KMnO_4$ . Pure vitamin A (0.05 per cent) in cyclohexane rapidly decolorizes aqueous  $KMnO_4$  (0.25 per cent in amounts up to 30 per cent of the volume of vitamin solution) on shaking in the cold in the presence of a little 5 per cent  $H_2SO_4$ . The supernatant cyclohexane solution is pipeted off and tested with the  $SbCl_5$  reagent. With small amounts of permanganate the blue colour is greatly weakened; with increasing amounts the colour changes through purple to blood-red. Using sufficient of the cyclohexane solution, colour-test maxima at 664, 615 and 565 m $\mu$  can be seen, with a further band at 642 m $\mu$  appearing slowly. The first band is not always easy to obtain, but its detection fits into the pattern of facts. Acknowledgment is made to Prof. T. B. Davie and to Drs. F. H. Carr and T. H. Mead for material and to Prof. T. P. Hilditch for suggestions.

The possibility that vitamin A might be dehydrogenated to the aldehyde under physiological conditions is not unreasonable in the light of what is known of such enzyme systems as those involving di- or tri-phosphopyridine-nucleotides, but it affords

of itself no hint as to the origin of colour in rhodopsin. On the other hand, it possibly fits the failure to find vitamin A in the decomposition products of visual purple solutions. Suppose that in the intact retina, vitamin A in equilibrium with its aldehyde occurs as a part of, or in proximity to, visual purple. The process of extracting pigment or hardening the retina would 'freeze' the equilibrium. In the dark-adapted retina this might well be very much on the side of the aldehyde, and in the absence of functioning enzyme systems the aldehyde might be expected to decompose slowly but irreversibly by oxidation.

Now the 'main chemical alteration which occurs in the retinal tissues on exposure to light is a general tendency to become acid. . . . The degree of acidity varies directly with the intensity and duration of the exposure to light and is greatest with yellow-green light' (Duke-Elder<sup>12</sup>). Irradiation involves the formation of phosphoric acid which disappears in the dark (Olmsted<sup>13</sup>). The identification of phosphoric acid as a part of the photochemically initiated sequence of changes is a further complication to the 'carotenoid-protein' hypothesis.

If there are objections to ascribing the visual purple absorption curve to a 'carotenoid', there are also difficulties in the suggestion that the chromophore is a flavin. The various yellow enzymes (containing alloxazine-nucleotides) all show maxima near 465, 380 and 275 m $\mu$ , but the visible absorption is too low both in respect of  $\lambda_{max}$  and  $\epsilon_{max}$  to fit the prosthetic group of visual purple.

Absorption maxima of yellow enzymes.		
Cytochrome reductase .. .. .	275, 385, 455	m $\mu$
'Old' yellow enzyme .. .. .	275, 380, 465	
'New' yellow enzyme .. .. .	275, 377, 455	

(Haas, Horecker and Hogness<sup>14</sup>). There is, however, no doubt that a marked inflexion occurs near 490-495 m $\mu$ , corresponding with a somewhat masked absorption band (cf. Theorell and Haas<sup>15</sup>).

Early in the work on riboflavin it was observed that reduction in 10 per cent hydrochloric acid gave an intense red intermediate phase ( $\lambda_{max}$ . 490 m $\mu$ ) also recorded for alloxazines like lumiflavin (Kuhn and Wagner-Jauregg<sup>16</sup>; Stern and Holiday<sup>17</sup>). This semi-quinone formation has also been shown to occur under much more physiological conditions when yellow enzyme is reduced in the presence of a large excess of tri-phosphopyridine-nucleotide (Haas<sup>18</sup>). The red ferment is thus probably a flavin-pyridine-nucleotide, both prosthetic groups being bound to protein.

	$\lambda_{max}$ .	
Yellow enzyme .. .. .	465	380 m $\mu$
Red phase .. .. .	475	360

This red ferment is the closest physiologically plausible analogue of visual purple which is so far known. It requires, however, a reducing agent which shall effect an easily reversible partial reduction at the alloxazine ring. The 'flavin' and 'carotenoid' functions can be married by attributing this reduction to vitamin A aldehyde. On this basis the aldehyde, accumulating sluggishly through the action of, for example, tri-phosphopyridine-nucleotide on vitamin A, conditions the speed of visual purple regeneration. The primary photochemical process will not be a reversal, but a partial direct oxidation to yellow enzyme, and vitamin A aldehyde will not be affected. Hence retinene could be obtained from dark-adapted retinas, and in visual purple solutions would be oxidized away. The alloxazine-nucleotide, oxidation-

reduction system, moreover, affords a rational basis for electron liberation.

Any adequate working hypothesis for the visual process requires *stages* in the oxidation-reduction system. According to the work of Kuhn and Ströbele<sup>19</sup>, such stages are demonstrable with arboflavin:

		Oxygen uptake in regenerating 1 mol. flavin
Flavin	yellow	0
Verdoflavin	bronze-green	0.25
Chloroflavin	grass-green	0.50
Rhodoflavin	carmine-red	0.75
Leucoflavin	colourless	1.0

In the case of "photo-hepato-flavin", Stern and Holiday record:

		$\lambda_{max}$
Holoquinone	neutral	364, 440 m $\mu$
"	in 0.2 N HCl	267, 385 m $\mu$
"	in 0.2 N NaOH	263, 352, 442 m $\mu$
Semi-quinone	in 0.2 N HCl	358, 490 m $\mu$

It is conceivable that the 387 m $\mu$  maximum recorded by Wald for retinene is really due to a flavin concomitant and not to the 664 m $\mu$  chromogen. It is a curious fact that the lens emits a pale greenish-yellow fluorescence, the most effective spectral region for its production being 370–390 m $\mu$ , maximum 385 m $\mu$  (Hoffmann, quoted by Duke-Elder<sup>20</sup>). I have obtained from horse lenses a chloroform-soluble material absorbing in this region and giving a strong sky-blue fluorescence (possibly due to dimethylalloxazine).

Vitamin A aldehyde could be replaced by vitamin A<sub>2</sub> aldehyde without fundamentally affecting the 'flavin' mechanism for scotopic vision. It could likewise function in photopic vision. Here it is not irrelevant that the optical properties of planar molecules are known to be susceptible to change with dimer and polymer formation, and with molecular orientation both with respect to surfaces and molecular axes.

To summarize this discussion, an attempt has been made (1) to account for the evidence that poor scotopic vision may follow from avitaminosis-A or -B<sub>2</sub>; (2) to suggest a mechanism for the intervention of vitamin A (or A<sub>2</sub> in freshwater fishes); (3) to explain why vitamin A is not obtainable from visual purple solutions; and (4) to devise a mechanism which allows vitamin A to participate, albeit indirectly, in both photopic and scotopic vision, without leaving the photochemical problem in mid-air.

The whole range of trustworthy data on visual processes and perhaps even of bioluminescence will need to be fitted into an acceptable theory. It is of small consequence if the suggestions now made turn out to be inadequate as new facts are gathered. The important thing at this stage is that the chemical aspects of the problem should be focused more sharply, and the difficulties faced.

<sup>1</sup> Hecht, *Ann. Rev. Biochem.*, **11**, 476 (1942).

<sup>2</sup> Mitchell, "Vitamins and Hormones", **1**, 167 (1943).

<sup>3</sup> Wald, "Vitamins and Hormones", **1**, 215 (1943).

<sup>4</sup> Granit, *NATURE*, **151**, 631 (1943).

<sup>5</sup> Krause and Sidwell, *Amer. J. Physiol.*, **121**, 215 (1938).

<sup>6</sup> Wald, *J. Gen. Physiol.*, **21**, 810 (1938).

<sup>7</sup> Lythgoe and Quilliam, *J. Physiol.*, **94**, 399 (1938).

<sup>8</sup> Dartnell, Goodeve and Lythgoe, *Proc. Roy. Soc., A*, **156**, 158 (1936); *A*, **164**, 216 (1938).

<sup>9</sup> Adler and v. Euler, *NATURE*, **141**, 790 (1938).

<sup>10</sup> Theorell, *Biochem. Z.*, **279**, 186 (1935).

<sup>11</sup> Heilbron *et al.*, *J. Chem. Soc.*, 175 (1938); 128 (1939).

<sup>12</sup> Duke-Elder, "Text Book of Ophthalmology", **1**, 830.

<sup>13</sup> Olmsted, *Ann. Rev. Physiology*, **1**, 453 (1939).

<sup>14</sup> Haas, Horecker and Hogness, *J. Biol. Chem.*, **136**, 747 (1940).

<sup>15</sup> Theorell and Haas, *Biochem. Z.*, **298**, 378 (1937).

<sup>16</sup> Kuhn and Wagner-Jauregg, *Ber.*, **67**, 361 (1934).

<sup>17</sup> Stern and Holiday, *Ber.*, **67**, 1352 (1934).

<sup>18</sup> Haas, *Biochem. Z.*, **290**, 291 (1937).

<sup>19</sup> Kuhn and Ströbele, *Ber.*, **70**, 753 (1937).

<sup>20</sup> Duke-Elder, "Text Book of Ophthalmology", **1**, 820.

## STATISTICS IN SEDIMENTARY PETROLOGY

By DR. P. ALLEN

University of Reading

RECENT publications show that at long last there is a flood-movement in British geological research towards the accumulation of increasingly precise quantitative data. The transition from the qualitative phase, painfully slow at first, has lately been accelerated in most branches of the science. This limited progress is especially marked in sedimentary petrology, where Fleet, Butterfield, Smithson and Walder have raised a banner which all must surely follow.

Without a doubt this vigorous movement marks only a beginning. Already some of its protagonists, wallowing in a mire of seemingly endless figures, are beginning to question the wisdom, and indeed the reliability, of their laborious endeavours. Attempts at extrication by crude mathematical methods (concerning the reduction and not the reliability of data) have met with little success. Other petrographers, less desirous of reaching immediate conclusions, are content merely to amass information of unqualified precision in the hope that one day it may prove useful.

All the present difficulties and discrepancies have one common underlying cause. They are due entirely to the widespread inability of geologists first to recognize, and secondly to deal with, the various types of population commonly encountered in petrological research. No matter if these populations are finite or infinite, and irrespective of which sedimentary variates they concern, their behaviour and its repercussions remain uninvestigated and almost completely ignored. Yet, to quote the most fundamental example, all petrological work, even that concerned with the smallest finite populations, relies on sampling for its practicability. Consequently, though the distinction between some of the statistics actually used, and the parameters estimated, may often be recognized, no allowance is ever made for it—the penumbra of error darkening our petrological morass are left well alone! Yet it is idle merely to record the useless fact that zircon reaches a mean size of "50  $\mu$ " in a certain locality; statement of the statistic in conjunction with its (qualified) standard error—as "50  $\mu \pm 3 \mu$ "—conveys information of considerable geological value.

In consequence of the shortcomings outlined above, interpretations drawn from quantitative petrographical data usually either do not justify the laborious methods used, or (especially when 'conclusive') are largely unwarranted. The former situation involves waste of data and both involve waste of time. Indeed, I know of no geological work (published in Britain) that contains one conclusion stated as an honest mathematical probability. I am also unaware of any paper devoted mainly to quantitative information which is enlightened by a really comprehensive account of the sampling and analytical techniques employed. Truly, appraisal by the sceptic is normally quite impossible. Consistently with this state of affairs, investigations planned to achieve desired degrees of precision—indeed degrees of precision themselves—are practically unknown in British geology. The present difficulties are all the more surprising when we consider that the mathematical techniques necessary for their removal have existed

for some time. One can only conclude that for three decades most geologists have worked in complete oblivion of the progress of statistical science.

During the past five years, much work in the Department of Geology at the University of Reading has been devoted to the application of statistical methods to geological problems, especially those of a petrological and stratigraphical nature. In the sphere of sedimentary petrology the mathematical techniques have already more than justified their adoption.

### Selection of Fields of Study

Statistical control exerts its first influence in the selection of fields of study. The preferable fields are those which permit detailed investigation of (1) the areal petrographical characters of widespread but thin horizons (less than 6 in. thick), and (2) the vertical petrographical successions in single localities. By the first approach an attempt is made to treat certain selected geological 'moments' separately throughout their accessible extents, and so to elucidate the *spatial* distributions of their petrographical characters. By the second, the distributions *in time* of petrographical characters are studied at selected points. In such a manner the invalidating effects of the two types of distribution upon one another may be minimized each in turn. Unfortunately, the nature and number of actual and potential exposures very often leave the sedimentary petrologist no choice but to concentrate largely upon one or other of the two viewpoints. When quarries and other sites are normally small but very numerous (as in the Wealden rocks of south-east England), horizontal studies often yield the more valuable results; when they are extensive but few (as in the Tertiaries of the Isle of Wight, now being studied by my colleague Miss P. S. Walder) investigation of the petrographical sequence in time frequently appears to be the more promising. I recently completed an areal study of the Top Ashdown Pebble Bed<sup>1</sup> in the Weald of Kent, Surrey and Sussex, using an arbitrary 2-in. horizon situated 4 in. down in the underlying sandstone as 'control'. Since the efficacy of statistical methods has been most fully tried out on this sediment, particular reference thereto is made in the present outline.

If a horizontal study has been decided upon, the petrologist should next ensure that the sampling on which it is to be based will be as nearly random as possible. The distribution of satisfactory exposures usually limits him in this respect, because, being controlled by factors other than chance, it is not necessarily a random one. Secondary sampling from them at random is seldom possible either, for the exposures at any one widespread horizon less than 6 in. thick are usually all too few at the start. The sandpits and openable sites at the Top Ashdown Pebble Bed horizon were apparently distributed according to factors quite unrelated to the petrographical characters of the bed. The risks inherent to an assumption of randomness, being therefore considered minimal, were ignored, and attention was merely focused upon ensuring random sampling within the sites located.

### Choice of Statistics

Preliminary analysis of a few field samples (by the usual methods of gravity separation, and counting of *entire* residues) indicates the range of statistical values likely to be necessary for the subsequent sample and horizontal characterizations. In general, the constituents of sediments are found to be most easily dealt with through separate consideration

of two or three fractions, namely, (1) the allogenic pebble suite (when present), (2) the allogenic light and heavy grain suites, and (3) the authigenic light and heavy suites. The minimum quantitative requirement is that in every field sample each of these five suites shall be fully characterized by statistics relating to frequency, abrasion, grade size and sorting. The frequencies (expressed as percentages) of all pebble and mineral grain species, varieties and other distinctive types, should be determined, together with their 'errors'. The degrees of abrasion are best expressed as the percentages of euhedral, subangular, angular and rounded individuals (suitably defined), average size as their arithmetic mean sizes (based on measurements of intermediate axes), and degrees of statistical sorting as the coefficients of variation derived from the data yielding their means. Calculation of errors is of course necessary in all cases.

During the study of the Top Ashdown Pebble Bed, the determination of the grade sizes and degrees of sorting of all the species, varieties, etc., in every subsample was found to be too time-consuming. This difficulty was overcome in the case of the allogenic heavy suite by using the values pertaining to zircon (probably the most stable mineral) as indexes typifying the whole suite. The validity of the method was confirmed by replicate analysis and by detailed comparisons with other species. The allogenic heavy grain suite of each Ashdown field sample was thus finally characterized at least by (1) complete frequency analysis, (2) the 'zircon abrasion index' (equals per cent of euhedra among the zircons), (3) the 'zircon size index' (equals the mean size of zircon), and (4) the 'zircon statistical sorting index' (equals the coefficient of variation of the zircon grain-size distribution).

### Estimation of Minimum Subsample Size and Standard Errors

The field sampling and characterization designs having been settled, it is necessary to estimate the minimum number of pebbles or grains in the subsamples pertaining to each suite which will be necessary to achieve sufficient accuracy for studying the variations anticipated in the various populations of the sediment. Analysis of a few subsamples of arbitrary sizes from widely different sedimentary grades usually suffices for a provisional estimate. In the case of the Top Ashdown Pebble Bed, the subsample sizes were standardized at greater than 200 for pebbles and greater than 1,000 for grains.

In order to establish the degrees of significance of the chosen statistics and to recognize when significant differences exist between them (within the aims of the investigation), the petrologist must be able to estimate their associated 'errors'. Because these (best expressed in the form of standard errors) necessarily always embody components due to random sampling ( $SE_r$ ) and experimental treatment ( $SE_e$ ) they may be termed 'total standard errors'. Their magnitude will vary with the project and the consequent unit of comparison—normally either the subsample, the 'patch' or the 'locality'.

1. *Standard Errors of the Subsample ( $SE_s$ )*. During the preliminary work it is convenient first to investigate the total standard errors ( $SE_t$ ) of statistics referring to the adopted subsample alone. Values for these, in terms of their component sampling errors, may be obtained from series of replicate analyses of homogenized material drawn at random from the known grade-size range of the sediment. For pur-



poses of improvements in laboratory technique,  $SE_e$  may also be calculated for each species from the data. In the case of frequencies, significant differences between the total and the sampling errors within series are best tested by  $\chi^2$ , using Brandt and Snedecor's formula<sup>2</sup>. Graphed against frequency, the values ( $k_e$ ) of the ratio  $SE_e/SE_p$  determined for each species may be used in the subsequent assay as a basis for estimating the total errors from the sampling errors of single values. In this way the otherwise inevitable replication of each sample in the main investigation is obviated.  $SE_e$  is most necessary for use in the tests of significance involved during the study (by concentrated sampling) of local small-scale petrographical variation, or 'patchiness'.

2. *Standard Errors of Patchiness ( $SE_p$ )*. Combined with the thin sampling normally forced upon petrologists,  $SE_e$  is not, unfortunately, necessarily large enough to deal with the establishment of more widespread changes, such as the recognition of minor petrographic 'regions'. Estimation of a sufficiently comprehensive error, the 'standard error of patchiness' ( $SE_p$ ), allowing for small-scale variation within the sediment, may be conducted in the same general way as that of  $SE_e$ , but using instead the ratios ( $k_p$ ) derived from random series of replicate samples of *unmodified* material, the latter being taken at random from small horizontal areas of constant size. For the Top Ashdown Pebble Bed these areas were fixed at  $\frac{1}{2}$  sq. ft.

3. *Standard Errors of Locality ( $SE_l$ )*. When horizontal sampling is thin, and broad petrographic regions are to be established, the unit of comparison strictly becomes the locality, and an error even more comprehensive than  $SE_p$  is needed. One such, the 'standard error of locality' ( $SE_l$ ), may be estimated as before from its component sampling error by means of specific factors ( $k_l$ ) obtained from preliminary replicate sampling within 'localities'. During the study of the Top Ashdown Pebble Bed, a 'locality' was defined as a quarry of a certain size. Unexpectedly, however, analysis of variance showed that none of the values obtained for  $k_l$  significantly exceeded the corresponding  $k_p$ 's, and  $SE_l$  was consequently taken as approximately equal to  $SE_p$ .

### Manipulation of Standard Errors

The three standard errors may be manipulated during the subsequent work in the usual way, the particular error used and the level of significance chosen varying with the aims in view and the sampling concentrations achieved. The assumption that the distributions of the variates concerned are normal must necessarily be provisional until they are more extensively investigated.

Much arithmetical labour may be avoided in the large numbers of frequency comparisons afterwards carried out, by preparing beforehand curves of significant differences based on the various  $k$ -factors and the chosen level of significance. The level of significance adopted during the Ashdown work was  $P < 0.05$ , and since all grain counts either equalled or exceeded 1,000 individuals, a frequency  $p_1$  per cent of a mineral was considered to be significantly different from that ( $p_2$  per cent) in another sample only when

$$p_2 > \frac{50(5p_1 + k^2) + k\sqrt{2500k^2 + 100(k^2 + 500)p_1 - (k^2 + 500)p_1^2}}{250 + k^2}$$

where  $k$  was the value of  $k_e$ ,  $k_p$  or  $k_l$  appropriate to the mean of  $p_1$  and  $p_2$ . Curves were therefore prepared for the above relation as an identity (graphing  $p_2$  against  $p_1$ ) when  $k = 1, 1.5, 2, 2.5, \dots, 6.5, 7$ . From these, the status of a large majority of differences could be read off at sight.

The pebble counts were treated in the same general way.

### Mapping of Statistics

The kinds of statistic relating to the several species, varieties, etc., obtained during the main investigation, are best plotted on to separate maps as they are obtained, and their frequency distributions finally inserted thereon. The latter may be examined by moment-analysis.

During the insertion of 'contours' designed to emphasize the main trends of change and similarity, rigid statistical control is vitally necessary if they are to have any real meaning. By far the best scheme is to make the contour intervals equivalent to minimum significant differences; for example, for  $P = 0.05$  when the total counts always exceed the intended minimum size.

When the collection of data concerning the horizon is completed, statistical reduction and analysis of variation become guides to interpretation rather than policemen to methods. The analysis and inter-horizontal comparison of correlations between variates, neatly carried out in terms of the correlation coefficient ( $r$ ), is illustrative in this respect. Several significant correlations (up to  $+0.71 \pm 0.087$ ) were established between mineral frequency and sedimentary grade size, stratigraphical variates and grade size, etc., in the Top Ashdown Pebble Bed. These in turn led to further investigations which showed, for instance in the first example, that they were usually direct results of the interplay of former hydrodynamical conditions and the relative abundance of source materials. Post-depositional alteration was shown to have taken a very minor role.

### Statistical Characterization of the Sediment as a Whole

The final statistical characterization of the entire horizon is most conveniently given by the arithmetic means, standard deviations and standard errors of the frequencies, abrasion indexes, size indexes and sorting indexes of each mineral and pebble species, variety, form, etc., together with the significant correlations (qualified by their standard errors) established between certain of these variates. This should be regarded merely as a development of Butterfield's pregnant creations—his "characteristic formula" and "range formula"<sup>3</sup>.

The problem of comparing and contrasting sediments with sediments and other rock types by means of characteristic statistics is still under investigation. Though the possibilities of using  $r$  and  $\chi^2$  appear promising in this respect<sup>4,5</sup>, the difficulties of translating the statistical into geological correlations remain unsurmounted. Until, by their combined efforts, petrologists amass a fairly large sample of all such statistical relations, we can have no basis for making direct petrogenetical probability statements. The frequency suites of the arbitrary Ashdown horizon previously mentioned and of certain Yoredale Sandstones<sup>3</sup> yield (at present)  $r = +0.89 \pm 0.093$ , but our ignorance of the geological status of this value

forbids us to conclude that it necessarily implies a close genetical relationship.

A full exposition of the statistical methods outlined above will be given elsewhere in due course.

<sup>1</sup> Allen, P., *Proc. Geol. Assoc. Lond.*, 52, Fig. 57A (1941).

<sup>2</sup> Fisher, R. A., "Statistical Methods for Research Workers", 8th edit., 85 (1941).

<sup>3</sup> Butterfield, J. A., *Trans. Leeds Geol. Assoc.*, 5 (1940).

<sup>4</sup> Dryden, L., *Amer. J. Sci.*, 29, 393 (1935).

<sup>5</sup> Eisenhart, C., *J. Sediment. Petrol.*, 5, 137 (1935).

## OBITUARY

Dr. H. D. S. Honigmann

DR. H. D. S. HONIGMANN, formerly director of the Zoological Gardens at Breslau, and recently scientific adviser to the Dudley Zoo, who died on November 17, was born at Breslau on July 5, 1891. He was educated at the Johannes-Gymnasium at Breslau, whence he proceeded to study zoology, physics and philosophy at the Universities of Breslau and Heidelberg. In 1916 he graduated at Breslau under W. Kükenthal; his thesis for his doctorate was on the primordial cranium of the hunchback whale. On his demobilization in 1918 he decided to round off his biological training by the study of medicine, and in 1921 he graduated in this subject with a thesis on parasitic flagellates of the human lung.

In 1927, after a few years of work as medical practitioner and public health officer, Honigmann was appointed director of the Zoological Gardens at Breslau. This appointment opened up for him a sphere of work which had been his ambition from early boyhood—the keeping, rearing and observation of animals. After years of war and post-war depression, it fell to him to rebuild and modernize the Breslau Zoo, a task which he performed with out-

standing success. A number of scientific publications on observations on zoo animals were a by-product of this activity. He had just completed elaborate plans for a modern aquarium when his work was interrupted in 1934 by political events in Germany. He resigned his post and went to London where, following an invitation by Dr. Julian Huxley to work at the London Zoo, he carried out a series of studies on the nutrition of mammals, which led to the publication of a number of papers on the subject. His appointment in 1937 as scientific adviser to the newly founded zoo at Dudley gave him ample opportunity to make use of his wide experience in the scientific management of a modern zoo.

The outbreak of the War having brought his work at Dudley to an end, Honigmann took the post of science master at Blundell's School at Tiverton, whence the vicissitudes of the War took him to the Zoology Department of the University of Glasgow. There, on the invitation of Prof. E. Hindle and supported by a grant from the Society for the Protection of Science and Learning, he carried out a series of investigations in animal psychology, including work on the number conception in the fowl, a critical review of the problems of number conception in animals in general, and an analysis of movement vision in toads. His remarkable skill in the planning and execution of accurately controlled experiments, his thorough knowledge of the intricate problems of animal psychology, and not least his patience and experience in the handling of animals, make his publications in this field of lasting value; his last paper is still in the press and will appear in the *Proceedings of the Royal Society*. Plans for extensive further research in this field were frustrated by his death.

All who knew Dr. Honigmann will remember him as a scientific worker of great ability and experience, a warm friend and admirer of animals, and a person loved for his quiet charm, kindness and good-humoured companionship. OTTO LOWENSTEIN.

## NEWS and VIEWS

### Jet-Propelled Fighter Aircraft

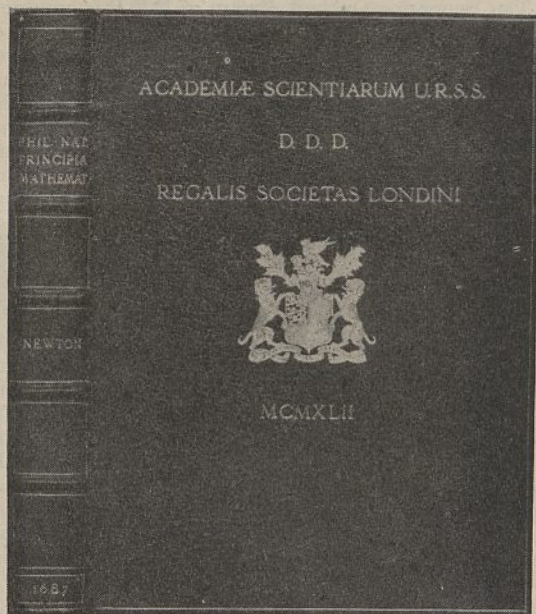
THE R.A.F. and the U.S. Army Air Force recently released information upon the progress made with jet propulsion for aircraft. The development of this for the R.A.F. is stated to have been in the hands of Group Captain F. Whittle, with the late Flight Lieutenant P. E. G. Sayer as test pilot. The special engine was built by Power Jets, Ltd., and the original aircraft by the Gloster Aircraft Co., Ltd. Experiments were afterwards continued in conjunction with the U.S. authorities, and further engines and aircraft were built in the United States by the General Electric Co. and the Bell Aircraft Co. respectively. These experiments have produced an aircraft judged to be sufficiently successful to warrant a partial adoption of the type, and production is now in hand of a sufficient quantity for training purposes in both countries.

The principle used in these machines is that air is taken in at the front of the body, compressed and heated, and exhausted at the rear end with increased velocity and temperature. The reaction produced is an axial thrust that replaces the normal propeller thrust. In general its efficiency would be greater,

and there are additional practical advantages. The practical limitation in propeller diameter has already been reached, and some other way of turning the engine power into a propulsive thrust is necessary if any further increase in the power of individual engines is envisaged. Driving several airscrews from one engine has many practical limitations, the weight and unreliability of the transmitting mechanism being the principal, but by no means the only, trouble. Gyroscopic effects and the rotation of the slip stream are also eliminated by the absence of the rotating airscrews. Ground or water clearance can now be less if either structural or aerodynamical considerations demand it, as the propeller diameter no longer governs this. The first public claim to have produced a successful jet-propelled aircraft was made in Italy in December 1941, when it was stated that a Caproni-Campini C.C.2 machine flew from Milan to Rome at an average speed of 130 m.p.h. Speeds of this order have no application in modern war aircraft, but there is no reason why larger engines giving greater powers should not be built, when once the success of the principle is established.

## Newton's "Principia" for the U.S.S.R.

On January 6 an interesting ceremony took place in Moscow. At the request of the Royal Society, H.M. Chargé d'Affaires presented to a deputation representing the Academy of Sciences of the U.S.S.R. a copy of the first edition of Newton's "Principia", together with the original draft of a letter by Newton to Prince Alexander Menshikov, acquainting the latter with his election into the fellowship of the Royal Society in 1714. The book, handsomely bound in



polished Levant morocco by the famous firm of John Gray and Sons of Cambridge, has an added value, because affixed within it is a sheet of vellum on which are recorded the signatures of the President and Council of the Royal Society in office when the gift was authorized. So far as can be ascertained, this is the only copy of a first edition of Newton's great work possessed by a scientific body in the U.S.S.R. Owing to indisposition, the President of the Academy could not be present when the gift was made; his place was, therefore, taken by the first deputy president, Academician Baykov. Incidentally, Prince Alexander Menshikov, a spectacular figure in the Russia of Peter the Great, was the first Russian to be elected into the fellowship of the Royal Society.

## Prof. Vladimir A. Obruchev

THE news that the honour of the Order of Lenin has recently been conferred on Prof. Vladimir A. Obruchev will be warmly welcomed by his admirers throughout the scientific world. Previously, his outstanding services to the U.S.S.R. had been recognized by his appointment as Cavalier of the Order of the Red Banner. In the minds of geographers and geologists, the names of Obruchev and Siberia are indissolubly linked. For more than a generation, Prof. Obruchev's studies of the stratigraphy, mountain-building movements and physiography of the eastern half of the vast Russian territory have earned our gratitude and respect, and his great work on the geology of Siberia (to which he has recently

added a fifth volume) has become a classic. But a few decades ago, this huge region was one of the least-known areas of the globe. Prof. Obruchev's earlier expeditions and investigations of the rock succession and tectonics laid the foundations for economic developments on an astonishing scale. At an early stage of the work, he carried out the survey for the location of the Trans-Siberian railway; later, in furtherance of the far-sighted policy of the Government of the U.S.S.R., he contributed to the transformation of the country into one of the great mineral-producing regions of the earth—a story reminiscent of a fairy-tale.

Under Obruchev's inspiration, his colleagues and assistants set out to discover and exploit the mineral wealth which was to prove so essential after the German occupation of western Russia. Their activities were directed to the finding of ores of aluminium, copper, gold, iron, manganese, mercury, nickel, niobium, tin and tungsten, as well as non-metals like coal, oil and diamonds. In most cases, outstanding success crowned their efforts: in particular, the development of new goldfields owes much to Obruchev's own work. Not content with thus awakening many parts of the great area by harnessing its resources for future use, Prof. Obruchev founded in 1939 an Institute (named in his honour the Obruchev Institute) for the study of permanently frozen soil. Such soil indeed covers one third of Russian territory, so it is not surprising that the Government encouraged the Institute (in which ethnographical studies also find a place) with funds for extensive research. In 1941, when Moscow was threatened, the Academy of Sciences was evacuated to Sverdlovsk. It is satisfactory to learn that the Academy, and Prof. Obruchev, have now returned to Moscow, and that Prof. Obruchev celebrated there his eightieth birthday (on October 10 of last year).

## Askanya Nova Nature Reserve

ACCORDING to news reaching Great Britain, the State nature reserve at Askanya Nova, near Melitopol, in the southern Ukraine, has been completely devastated during its occupation by the German army, which evacuated the area some weeks ago. The reserve comprised a vast area of virgin steppe, where, side by side with the undisturbed flora and fauna, typical of the southern Ukrainian steppes, a large number of introduced animals and birds have been bred for years under natural conditions. A field biological station, laboratories, museum and a library were attached to the reserve, which presented unique opportunities for researches in plant and animal ecology, for experiments in the acclimatization of introduced animals and birds, etc. It is now reported that most of the animals and birds, that were living free, were killed by German hunting parties specially organized for the purpose, while the wire enclosures of others were smashed by tanks and the inhabitants killed off wholesale. Some of the more valuable animals were, however, taken away to Germany; for example, two of the three wild Mongolian horses (*Equus Przewalskii*) were taken, the third killed. The few bisons were also killed. Most of the museum collections of birds and animals were transported to Germany, but the rich herbarium, insect collection and the library of more than 25,000 volumes were burnt. The removal of collections to Germany was carried out under the supervision of experts sent for the purpose.

## Industrial Research and Taxation

THE long memorandum on "Post-war Industrial Reconstruction" issued by the Internal Combustion Engine Manufacturers' Association covers a wide field and quotes extensively from the League of Nations report on "The Transition from War to Peace Economy". While some of its proposals regarding the disposal of Government stocks of internal combustion engines after the War may be open to objection—the suggestion that the balance, after meeting the needs of devastated countries, providing a war reserve, and improving training equipment at engineering schools and technical institutions, should be disposed of by an organization, representing the industry and the Government, in the way best calculated to promote the national development and least likely to affect adversely employment in the industry, is somewhat naïve—the report is yet another document emphasizing the importance of research. Dispersal of the industry's skill would undoubtedly be against the national interest, but the interests of producers can scarcely be allowed to dictate the disposal of surpluses, and the memorandum itself recognizes the necessity of continuing some national and international controls after the War, and on the whole shows a wide outlook and a readiness for more fundamental changes than mere attempts to mend the rents in the old pre-1939 patterns.

In regard to research, the memorandum urges that the position in regard to finance and especially the high level of taxation is a main reason for the inadequate prosecution of research in Great Britain. It suggests that all research expenditure should be allowed for taxation purposes, either when incurred or over a period of years, depending on the nature of the expenditure. Capital expenditure, such as that on laboratories and plant, and on patents, new designs and development to the commercial stage, should be granted relief on the basis of an allowance over a reasonable period of years. Research expenditure which is a normal incident of an efficient and progressive business should be allowed as and when made. Contributions to research organizations should be allowed similarly or, in special circumstances, spread over a reasonable period of years. Appropriate wear and tear allowances should be granted on plant and machinery acquired for the purposes of research, and if such plant and machinery is scrapped, any loss thereon, less any prior wear and tear allowance, should be allowed. The memorandum stresses the importance of clarifying the position as soon as possible, so that manufacturers can embark on an adequate programme of research and development with the knowledge that all such expenditure will rank for taxation relief.

## "Political and Economic Planning"

THE Broadsheet "P E P Work, 1940-43", recently issued by Political and Economic Planning (No. 215, December 14, 1943), includes a summary of the present programme, as well as a note on some recent publications on "Research and Industry", and a complete list of P E P broadsheets and reports during 1933-43. Nine groups are in more or less regular session, and at least five full-scale reports are planned for 1944. One of these is a comprehensive report from the Fuel Group on the co-ordination of the fuel industries considered as a whole. The Population Policies Group, which is run jointly by P E P and

the Eugenics Society, has begun to meet again, and it is hoped to publish a full-scale report as well as a number of broadsheets during 1944. A new edition of the P E P Report on the British Health Services is in prospect and a fully-fledged Health Group has again begun to meet regularly. The Physical Planning Group has concentrated attention in the past year on the complex social and economic factors influencing the pattern of physical planning and on the human needs to be satisfied, and in addition to further broadsheets a report will be published in 1944.

The Economic Outlook Group of P E P is conducting an investigation into the structure and functions of trade associations, and a broadsheet will be published early in the year. The International Group, from the publication of a forthcoming broadsheet on world political structure, will be replaced by an International Trade Group, the aim of which will be to present the facts about Britain's post-war export problem in its world setting. The Machinery of Government Group has completed two stages of its examination of the need for adjustment so as to make government the nation's common effective instrument for expanding its social and economic welfare, and when reconstructed this Group will tackle the problem of associating the ordinary citizen more closely with the process of local government. A special-purpose group to consider the future of Government information and publicity will follow the broadsheet on "The Future of Foreign Publicity" with one on home publicity. The work which formerly fell to the Partners in Industry Enquiry has again been taken up and several chapters drafted of a report on industrial relations, while further investigations are being made into the structure of industrial relations at the national, district and works levels.

## Progress in Bacteriological Technique

PROF. J. CRUICKSHANK has prepared for the British Council an account of recent advances in bacteriological methods (*Brit. Med. Bull.*, 1, No. 8; 1943). The principal advances in the last ten years have, in his opinion, been made in the discovery of more efficient selective culture media for the isolation of bacteria, in the determination of the stable sub-groups or types of bacteria and in the development of typing methods which make it possible to trace the probable source of an infection or an epidemic. Antigenic analysis has resulted in such valuable discoveries as the Vi or virulence antigen of the typhoid bacillus. Antityphoid serum made for therapeutic use should contain Vi antibodies. The blood of typhoid carriers almost always contains these, so that the Vi agglutination test has become a valuable means of helping to trace the sources of the infection. The discovery of a Vi bacteriophage, which has a specific action on Vi strains of typhoid bacilli, can be used for the identification of particular strains of these bacilli. Epidemiologists have used this means of tracing the source of isolated infections or epidemics. The typing of diphtheria bacilli has also produced valuable results.

Work on the hæmolytic streptococci has revealed, by the extraction from these streptococci of a carbohydrate substance which gives a precipitation reaction in the presence of the appropriate anti-serum, thirteen groups of these streptococci. The streptococci of major importance in human infections belong to Group A, and at least twenty-three types of these have been identified. It has been found that the



Now ready

## RADIO ENGINEERS' HANDBOOK

By F. E. TERMAN

Professor of Electrical Engineering and Executive Head, Electrical Engineering Department, Stanford University.

1019 pages, 9 x 6, 869 illustrations, 84 tables, 42s.

HERE is a comprehensive and detailed reference book for all in the radio engineering profession or whose work touches on problems of research, design, or application in this field. Never before has so much information about radio engineering been placed between the covers of one book.

Consult Terman's handbook for data needed in routine problems of design and practice, or in investigation of special problems or branches of work. Check your methods against best accepted practice, as reflected in its 13 big sections of carefully selected and authoritative facts. The handbook concentrates on tubes and circuits, transmitters, power supply, antennas—those topics of which the radio man thinks as radio engineering—presented in a profusion of concise descriptions, fundamentals, formulas, procedures useful in actual design, tables, and diagrams.

### CONTENTS

Tables, Mathematical Relations, and Units	Power-supply Systems
Circuit Elements	Radio Transmitters and Receivers
Circuit Theory	Propagation of Radio Waves
Vacuum Tubes and Electronics	Antennas
Vacuum-tube Amplifiers	Radio Aids to Navigation
Oscillators	Measurements
Modulation and Demodulation	

**McGraw-Hill Publishing Co. Ltd.**

Aldwych House, London, W.C.2.



## The Behaviour of Animals

An Introduction to its Study. By E. S. RUSSELL, D.Sc., F.L.S. Second Edition. viii+196 pages, 26 diagrams, 6 plates. 10s. 6d. net.

"It is to be hoped that this second edition may find the same warm welcome among biologists as the first edition."—*Science Progress*.

## The Louse

By P. A. BUXTON, M.A., M.R.C.S., L.R.C.P., Professor of Medical Entomology, University of London. x+116 pages, 28 diagrams. 7s. 6d. net.

"Destined to become the *vade-mecum* of everyone who is called upon to deal with lice from whatever point of view."—*Bulletin of Hygiene*.

## An Introduction to Physical Anthropology

By E. P. STIBBE, F.R.C.S., Second Edition. viii+230 pages, 56 illustrations. 10s. 6d. net.

## An Introduction to Industrial Mycology

By G. SMITH, M.Sc., A.I.C. Second Edition. xii+260 pages, 136 original photomicrographs. 20s. net.

"For a work of reference it is easy to read, and the reader is led beyond the immediate horizon by good lists of references, and a section upon mycological literature. . . . A very welcome and pleasing exposition of a little-known subject."—*Nature*.

## The Pasteurization of Milk

By G. S. WILSON, M.D., F.R.C.P., D.P.H., Professor of Bacteriology, London School of Hygiene and Tropical Medicine. xii+212 pages. 18s. net.

"A well-planned, well-written and well-documented book."—*Nature*.

## The Scientific Principles of Plant Protection

With Special Reference to Chemical Control

By HUBERT MARTIN, D.Sc., A.R.C.S., F.I.C. Third Edition. x+385 pages. 22s. 6d. net.

## Plant Ecology

By HILDA DRABBLE. 142 pages, with 24 photographs, mainly from Professor Salisbury's collection. 7s. 6d. net.

## A British Garden Flora

A Classification and Description of the Genera of Plants, Trees and Shrubs to be found in the Gardens of Great Britain

By Lt.-Col. J. W. G. KIRK, D.S.O., B.A., F.R.H.S. xii+585 pages, 223 illustrations by the author. 42s. net.

## A Handbook of Coniferae

Including Ginkgoaceae

By W. DALLIMORE, I.S.O., formerly of the Royal Botanic Gardens, Kew, and A. B. JACKSON, A.L.S. Second Edition. xii+582 pages, 32 plates and 120 diagrams. 42s. net.

Detailed Prospectuses and Catalogue on request

EDWARD ARNOLD & CO  
41 & 43, MADDOX ST., LONDON, W.1

The vacancies advertised in these columns are available only to applicants to whom the Employment of Women (Control of Engagement) Orders, 1942-3, do not apply.

### IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

SOUTH KENSINGTON, LONDON, S.W.7  
Physics Department Technical Optics Section

A course of six lectures by Mr. B. K. Johnson, D.I.C., on Microscopy will be given on Tuesdays and Fridays at 4 p.m. commencing on Tuesday February 1, 1944.

An optional course of practical work (consisting of 8 periods of 8 hours each) will be arranged during the six weeks commencing February 21, at times to suit those wishing to attend. These courses will be suitable for those having to use the microscope in technical practice; they will include advanced methods in microscopy, and ultra-violet microscopy.

Application for admission should be made to the Registrar of the Imperial College, Prince Consort Road, S.W.7.

### LEVERHULME RESEARCH FELLOWSHIPS, 1944

Application is invited for Fellowships and Grants in aid of research. The Fellowships and Grants are intended for senior workers who are prevented by routine duties or pressure of other work from carrying out research. They are limited to British-born subjects normally resident in Great Britain. In exceptional circumstances the Trustees may waive the condition as to residence.

The Trustees are also prepared to consider applications from groups of workers engaged upon co-operative programmes of research particularly from those engaged upon long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war.

The duration of the awards will not normally extend over more than two years or less than three months and the amount will depend on the nature of the research and the circumstances of the applicant.

Forms of application may be obtained from the Secretary, Dr. L. Haden Guest, M.C., M.P., Leverhulme Research Fellowships, Unilever House, Blackfriars, E.C.4.

Applications must be received on or before March 1, 1944. Awards will be announced in July and will date from September 1, 1944.

### UNIVERSITY OF GLASGOW LECTURESHIP IN CHEMISTRY FOR MEDICAL STUDENTS

Applications are invited for the post of Lecturer in Chemistry for Medical Students. The salary scale is £600-£700. The commencing point on the scale will be determined by previous experience. The appointment will be from October 1, 1944.

Further particulars may be obtained from the undersigned, with whom applications (20 copies) should be lodged not later than February 25, 1944. Applications should contain a statement of qualifications and experience, a note of principal publications, and the names of four or five persons to whom reference may be made. Testimonials are not required.

R. T. HUTCHESON,

Acting Secretary University Court.  
January, 1944.

Wanted: Laboratory type Sodium press, new or second-hand, required for research purposes.—Box 142, T. G. Scott & Son, Ltd., 9 Arundel Street, London, W.C.2.

### THE MAYNARD-GANGA RAM PRIZE

Applications are invited for the award of the Maynard-Ganga Ram Prize of Rs. 3,000 for a discovery or an invention or a new practical method which will tend to increase agricultural production in the Punjab on a paying basis. The Prize is open to all, irrespective of caste, creed or nationality, and Government servants are also eligible for it. Essays and these are not accepted. The Prize will be awarded for something practically achieved as a result of work done after the Prize was founded in 1925. Competitors in their applications must give a clear account of the history of their invention or discovery and must produce clear evidence that it is the result of their own work. In the case of an improved crop details of parentage, evolution and history and a botanical description are necessary.

The Managing Committee reserves to itself the right of withholding or postponing the Prize if no satisfactory achievement is reported to it, or to reduce the amount of the Prize or to divide it if the quality of the entries justify this decision.

Entries should reach the Director of Agriculture, Punjab, Lahore, not later than December 31, 1945.

### HUDDERSFIELD TECHNICAL COLLEGE

DEPARTMENT OF BIOLOGY

Applications are invited from men or women for the position of Lecturer in Zoology. Candidates should have Graduate qualifications and preferably teaching experience. Salary: Burnham scale plus war bonus. Forms of application (from the Principal of the Technical College) must be returned before January 31.

H. KAY,

Director of Education.

### LINEN INDUSTRY RESEARCH ASSOCIATION

Applications are invited for vacancies for an Assistant Chemist and Assistant Physicist. Candidates should have a first class honours degree and preferably some experience in textiles. Salary according to qualifications and experience.

Applications giving full details of age, qualifications and experience, should be addressed to the Director of Research, Linen Industry Research Association, The Research Institute, Lambeg, Co. Antrim, N. Ireland.

### University of London. The Senate invite

applications for the University Chair of Anatomy tenable at St. Mary's Hospital Medical School (salary £1,800). Applications (10 copies) must be received not later than first post on Monday, March 20, 1944 by the Academic Registrar, University of London, c/o Richmond College, Richmond, Surrey, from whom further particulars should be obtained.

### University of London. The Senate invite

applications for the following Chairs (salary £1,000), not later than first post on Monday, February 21, 1944: Chair of Botany tenable at King's College, Chair of Botany tenable at Birkbeck College. Further particulars should be obtained from the Academic Registrar, University of London, c/o Richmond College, Richmond, Surrey.

Chemist with Ph.D. degree or the equivalent experience required for the Research Department of a Heavy Chemical concern in the Manchester area. Applicants should have specialized in organic chemistry, but should also be competent to tackle problems in the inorganic field. The post is a permanent and progressive one. Please reply with full details to Chief Chemist, Box 141, T. G. Scott & Son, Ltd., 9 Arundel Street, London, W.C.2.

Scientific Films. Large industrial organization requires man or woman with scientific qualifications plus knowledge of or great interest in the making of educational films, particularly 16 m.m. Experience in teaching chemistry an advantage. Applicants should be free from liability for military service either on account of health or age, and available immediately. Write fullest particulars of experience and qualifications, salary desired, to Box 362, c/o Dawsons, 31 Craven Street, London, W.C.2.

### The proprietor of British patent No.

401,484 is prepared to license British manufacturers to work thereunder. It relates to the fractional distillation of volatile liquids and to processes for contacting immiscible fluids of different densities. Address: Boulton, Wade & Tennant, 112 Hatton Garden, London, E.C.1.

Wanted: W. Eitel, Fortschritte der Mineralogie, etc., volume 12, Berlin 1927. Librarian, B.X. Plastics, Branham Works, nr. Manningtree, Essex.

### High frequency Eddy Current Generator

3 to 5 K.W. new or secondhand required for high vacuum Laboratory. Please send particulars to Box P/N., c/o "Scientific," Cliffords Inn, London, E.C.4.

### Reflecting Telescopes: 6½" Mirrors of

excellent figure ready silvered, £10 8s. 6d. each; also 10 in. Mirror, 18 guineas.—R. Lee, "Infield," Bobell, Holywell, Flintshire.

### Refractometer wanted, Tully or Smith

type, in good condition.—Write, stating price, to Box 143, T. G. Scott & Son, Ltd., 9 Arundel Street, London, W.C.2.

### Stop-watch, also copy of De Bray's

"Exponentials Made Easy," wanted by manufacturers on work of national importance.—H. Frost & Co., Ltd., Walsall.

### Journal of Chemical Society, 59 Monthly

parts 1918-1923 including complete sets 1919, 1921. What offers? R., 8 Stradbroke Road, N.5.

### Graduate Chemist would welcome spare-time

abstracting and scientific or technical translations. French, German, Dutch, Spanish.—Box 144, T. G. Scott & Son, Ltd., 9 Arundel Street, London, W.C.2.

### Microscopes, of all descriptions, only a

few available second-hand, perfect condition. Send details of your requirements enclosing 3d. stamp.—Chards, Microscope Specialists, Forest Hill, S.E. 28.

JUST REPRODUCED IN U.S.A., taking approximately three months to secure

Landolt-Börnstein Physikalisch-chemische Tabellen

with all Supplements, 8 volumes in all, £72 0s. 0d.

REVISED LEAFLET GIVING DETAILS OF

GERMAN SCIENTIFIC BOOKS

Reprinted in America under authority of the  
Alien Property Custodian in Washington

Is now available from

H. K. LEWIS & Co. Ltd.

136 GOWER STREET, LONDON, W.C.1

Telephone: EUSton 4282 (5 lines)

# W. HEFFER & SONS LTD

BOOKSELLERS

CAMBRIDGE

will be glad to receive offers of:—

COMPLETE LIBRARIES, SETS OF JOURNALS &  
SMALLER COLLECTIONS OF BOOKS for which  
they are prepared to offer full market price and pay cash



They will also be glad to have enquiries for  
both new and second-hand books, English  
and Foreign, of which they carry an immense  
stock:

# CAMBRIDGE BOOKS

## EXPERIMENT AND THEORY IN PHYSICS

By MAX BORN

Professor Born discusses a sharp division of opinion between modern physicists and shows in a simple way the mutual relationship between theory and experiment in the actual history of science. He offers a balanced opinion on the present situation and future possibilities. 2s. net

## CLOUDS AND WEATHER PHENOMENA

By C. J. P. CAVE

A New Edition

*Revised with many new photographs.* 5s. net  
This popular and beautiful book, now for some time unobtainable, has been brought up to date.

## THE THREE AGES

*An Essay on Archaeological Method*

By GLYN E. DANIEL

A century of discovery and research has changed the use and modified the significance of the concept of the three technological ages of man. The author describes the origins and development of this idea, and makes suggestions for bringing it into line with present knowledge. 3s. 6d. net

## MANOMETRIC METHODS

By MALCOLM DIXON

*Second Edition. 19 text-figures.*

This small handbook gives the complete theory and full practical details of the method as applied to the measurement of cell respiration and other processes, and should be readily intelligible to workers without special physico-chemical knowledge. 8s. 6d. net

## THE NATURE OF EXPLANATION

By K. J. W. CRAIK

Outlines what is in effect a new theory of thought. The nervous system is viewed as a calculating machine capable of modelling or paralleling external events, and the theory suggests that this process of paralleling is the basic feature of thought and of explanation. 6s. net

## BIOLOGICAL REVIEWS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY

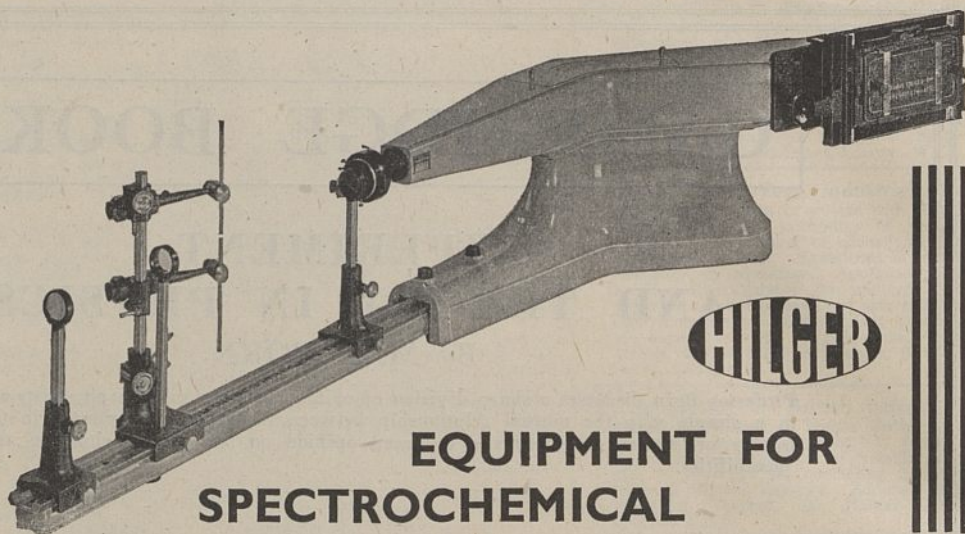
Edited by H. MUNRO FOX

*Biological Reviews* appears quarterly and embodies critical summaries of recent work in special branches of biological science addressed to biological readers.

Vol. XVIII. No. 4. October, 1943. 12s. 6d. net

*Contents:* Timber decay by K. ST. G. CARTWRIGHT and W. P. K. FINDLAY. Minor elements and plant growth by WINIFRED E. BRENCHEY. Osmotic regulation and the faunas of inland waters by L. C. BEADLE.

CAMBRIDGE UNIVERSITY PRESS



## EQUIPMENT FOR SPECTROCHEMICAL ANALYSIS

SUPPLIES OF THIS APPARATUS  
ARE LIMITED BY THE REQUIRE-  
MENTS OF WORK OF NATIONAL  
IMPORTANCE

### FOR NON-FERROUS METALS

The Barfit Flat-Field Medium Quartz Spectrograph and accessories (illustrated above)

### FOR FERROUS METALS

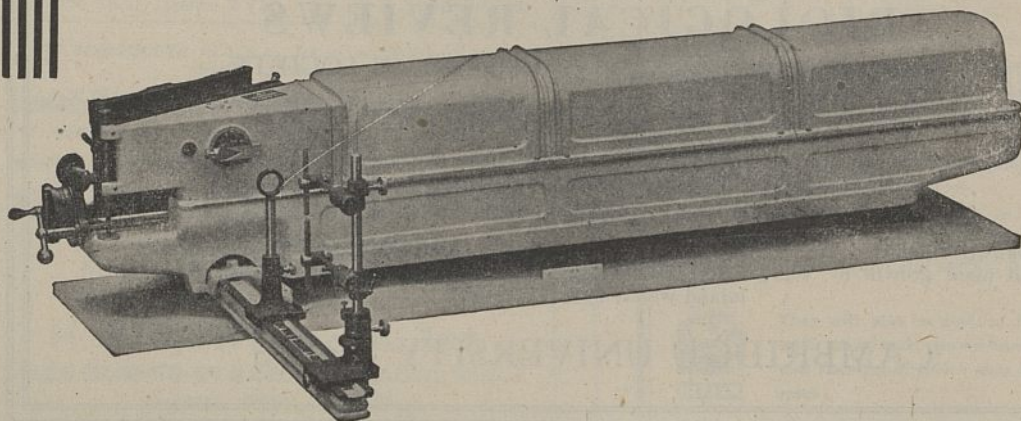
The Fully Automatic Large Quartz Spectrograph and accessories (illustrated below)

In constant use in works laboratories in conjunction with the HILGER Non-recording Microphotometer for rapid quantitative routine analysis of industrial alloys.

FULL DETAILS IN CATALOGUE S.B. 107  
POST FREE FROM

**ADAM HILGER LTD.** 98 St. Pancras Way **LONDON**  
Camden Road N.W.1

Phone: GULiver 4451





same hæmolytic streptococci can give rise to various manifestations in a single community. At Queen Charlotte's Hospital in London, this typing method has provided the valuable information that, in puerperal fever, infection of the placenta by organisms in the genital passages at the beginning of labour is almost a negligible cause of puerperal fever; the important sources of infection are the attendants or other contacts, or even the upper respiratory passages of the mother herself. Similar work on the staphylococci has not yet given such striking results, but it is proceeding. The War has, of course, greatly stimulated work on organisms of the gas-gangrene group. Methods of growing anaerobic bacteria in the presence of air have been devised, and they have been grown on ordinary broth or peptone water containing a small strip of sheet iron.

### A Film of Hospital Treatment

A REMARKABLE film, made by Gaumont Instructional Films, which is being shown under the auspices of the British Council, shows the successful operation by a British surgeon for the removal of the whole lung. The pictures are so taken that the spectator sees at least as much as, if not more than, most of the surgeon's assistants. At the beginning of the film the patient is shown, with his fellow workers in a factory, undergoing routine examination of the chest by X-ray. A cancer of the root of the lung is suspected in him, and the diagnosis is discussed by several experts in the light of subsequent examinations. Operation is decided upon and the patient sees the hospital almoner, who relieves his anxiety about the welfare of his wife and family while he is away from work. The special methods of anaesthetizing the patient are then shown and the operation itself follows, the spectator seeing the beating heart, the ligature and division of the pulmonary veins and the bronchus and other details. The rest of the film shows the after-care of the patient and his rehabilitation in a convalescent home until he returns to work. The British Council's chief function is, of course, to make British institutions and methods known abroad. This film, however, might well be shown widely in Great Britain.

### Women's Health in War-time

In a note entitled "Healthier Women—a War-time Asset", the *Statistical Bulletin* states that comparison of the mortality of women in the United States for the two years prior to the entry of that country into the War of 1914-18 with that for the two years (1940-41) before Pearl Harbour shows that women were benefited by the increasing control over disease. During this 25-year period, the death-rate among women insured in the Industrial Department of the Metropolitan Life Insurance Company, New York, has been reduced by about half. There were thirteen deaths in every 1,000 women aged from 15 to 74 in 1915-16 as compared with only seven in 1940-41. The decline in mortality from tuberculosis has contributed more than any other factor to this remarkable record. The control of pneumonia has also contributed much to the improvement in the total mortality among women. Diseases associated with pregnancy and childbirth have been sharply reduced since 1918. Diabetes alone has increased in the past twenty-five years among women. As regards suicide, the death-rate among insured women in 1940-41 was about two thirds the rate in 1915-16, and for accidents the proportion was three fourths.

### An Ultra-High-Speed Motion-Picture Camera

ACCORDING to an article by H. J. Smith (*Bell Lab. Rec.*, 22, No. 1; October 1943) a new high-speed camera, known as the Western Electric Fastax High-Speed Motion-Picture Camera, is capable of taking pictures at the rate of 8,000 per second. Fastax cameras are made in both 8 mm. and 16 mm. models. The 8 mm. model will take from 300 to 8,000 pictures per second, depending on the voltage applied to the motors, while the 16 mm. model will take from 150 to 4,000 pictures per second. Approximately full speed is obtained at nominal line voltages from 110 to 125 volts. To secure lower speeds a rheostat may be placed in series with the motor to reduce the applied voltage.

These new cameras are of the continuous-motion type employing an optical compensator, or rotating prism, between the lens and the sprocket. The 8 mm. camera has an eight-sided prism permitting eight pictures per prism revolution, and the 16 mm. camera has a four-sided prism permitting four pictures per prism revolution; each revolves in synchronism with the film. The prism creates successive and properly spaced images travelling with the film. The image gathered by the lens is refracted by the prism upward to meet the incoming frame, and as the frame advances downward, the image follows, thereby permitting continued exposure throughout the period that the film travels past the aperture. The duration of the exposure is controlled by the speed of rotation of the prism. Both these cameras are arranged to use either 100-ft. or 50-ft. spools of film. At top speed the film travels through the camera at about 70 miles per hour, the exposure time per frame being about 1/30,000 sec. for the 8 mm. camera and 1/12,000 sec. for the 16 mm. camera. At full voltage one hundred feet of film runs through the camera in approximately 1.25 sec. The motor driving mechanism is described in the article.

### Physical Significance of Maxwell's Theory

In a lecture delivered by Mario Bunge on June 21, 1943, before the Faculty of Industrial and Agricultural Chemistry of the National University of Litoral, under the title "Significado Fisico e Historico De La Teoria De Maxwell", the work of Maxwell is considered, and its influence in his own day and also on posterity is dealt with (Buenos Aires: Universidad Obrera Argentina. Pp. 16). Among the important effects of Maxwell's theory may be noted the downfall of mechanism for the second time in history. The first non-mechanical theory was the undulatory theory of light under Huygens, Fresnel, MacCullagh, Green, Cauchy, etc., and now for the second time physics seemed to be released from the thralldom of mechanism. The opinion of Gustavo Avé Lallemand, one of the few authorities on physical science in the days of Maxwell, is worth recording. He said that the English, so practical, had created a new science, "la Electrometria", which teaches us how to calculate all the effects of electrical phenomena, though adding nothing to the manner of explaining the nature of electricity (*Anales de la Sociedad Científica Argentina*, 13, 193; 1882). For Maxwell a model was simply a method for teaching but not a real need, and he was convinced that electromagnetism was not reducible to mechanism. In conclusion, it is pointed out that Maxwell's theory has developed in its form and consequences in such a manner, that in the mechanics of de Broglie, Schrödinger, Heisenberg, Born and

Dirac, not only has there been a unification in electromagnetism and optics, but these have also been unified with mechanics. The evolution of physics has therefore followed, to a considerable extent, the pathway marked out by Faraday and Maxwell.

### Riboflavin Deficiency in Fowls

DEFICIENCY of riboflavin (vitamin B<sub>2</sub>) in chick rations leads to poor growth and may give rise to 'curled toe paralysis'. Where skim milk is available, this trouble is unlikely to occur; but under war-time conditions rearers are forced to depend chiefly on mash. Official regulations have ensured that all rearing mixtures contain adequate riboflavin; but owing to the fact that essential ingredients such as dried skim milk and dried yeast are in short supply, the possibility of using an alternative source of the vitamin has been investigated by the Chemical Division of the Agricultural Research Institute of Northern Ireland. The results are published in its sixteenth Annual Report, 1942-43. Chicks were reared from hatching to fourteen days on a basal ration adequate in protein, minerals, and vitamins A and D but deficient in riboflavin. They were then divided into groups and supplied with various levels of either dried skim milk or dried liver in addition to their basal ration, one group continuing on the basal ration alone. 5 per cent dried liver was slightly more effective than 10 per cent dried skim milk for growth, and no cases of 'curled toe paralysis' occurred in either group. So little as 1 per cent dried liver improved growth but was insufficient to prevent the leg weakness. A further test fully confirmed these results and also showed that 10 per cent dried lung was as good as 5 per cent dried liver, so that both meals may prove a valuable new source of riboflavin-rich protein supplement for chick-rearing rations. A small stock of these meals has been produced, and work on the subject is being continued.

### Literature of Rheology

In the August issue of the *Rheology Bulletin*, published by the Society of Rheology under the auspices of the American Institute of Physics, a new feature, "Rheology Reviews", is started with a survey by Dr. R. Dow of "Some Rheological Properties of Matter under High Hydrostatic Pressure". It is intended that the new series shall furnish a perspective of a wide field of knowledge, and that each survey shall be prepared by an expert in the field. In the same number more than twenty pages of abstracts are given. The journal is published quarterly from 175 Fifth Avenue, New York, N.Y., and was founded to help workers in the fields of elasticity, viscosity, plasticity and the like, to a better understanding of their common problems. It was created as a medium for the exchange of information as to theories and methods relating to the rheological properties of matter. The issue for November 1942 contains details of the contents of the *Journal of Rheology* published by the Society during 1929-33. In 1933 the new journal *Physics*, now called the *Journal of Applied Physics*, began to publish the rheological material. Incidentally, the *Bulletin* illustrates a cheaper method of publication of journals with a small circulation: the matter is prepared on a typewriter with graphs and the mathematical parts added by hand. The copies are then printed by the use of photo-lithography.

### Electrolytic Production of Hydrogen and Oxygen

"The Production of Hydrogen and Oxygen by the Electrolysis of Water" is the subject of a paper (*J. Inst. Elec. Eng.*, 90, Pt. 1, No. 35; Nov. 1943) by Mr. C. E. Bowen, which reviews the principles and practice of the electrolysis of water and discusses its interest to the electrical engineer. Following the chemical expression of the process, the various factors influencing the yields and power requirements are considered. In the theoretical treatment, the application of Faraday's law is discussed, together with the question of current efficiency. The factors controlling the cell voltage, such as minimum-decomposition voltage, over-voltage, current density and resistance of electrolytes are studied, data being supplied as a guide to the general design requirements of this type of equipment. Methods and materials of construction are also discussed, with some notes on the handling of the gases. The paper describes some modern types of apparatus, and the performance of the equipment is illustrated. The demand for the two gases is discussed and some of their uses are defined. Finally, the author suggests, on the basis of some of the figures included, that the large amounts of power concerned should be of the greatest interest to electrical engineers.

### Anti-malaria Campaign in Panama

A RECENT paper (*Bol. Of. San. Panamericana*, 22, 502; 1943) published by the Malaria Section of the Ministry of Public Health and Public Works of Panama contains an account of the following means adopted against malaria in Panama. More than 300 Anopheles breeding places in the towns of the interior are regularly kept under control by weekly inspection and identification of the larvæ. Eight species of Anopheles have been identified, namely, *A. albimanus*, *argyritarsis*, *pseudopunctipennis*, *apicimacula*, *albitarsis*, *strodei* and *neomaculipalpus*. The methods most favoured include the use of oil and Paris green. Paris green, which destroys only the larvæ, is preferred owing to the economy in use and facility of transportation. An approximate idea of the incidence of malaria in the different regions can be obtained from the incidence of malaria mosquitoes and the splenic enlargement and parasitic determination in school children. Rainfall records in infested regions are also of help. Sanitary education by lectures, cinemas, meetings, etc., is slowly progressing.

### Treatment of Peripheral Nerve Injuries

THE *British Medical Bulletin* is published monthly by the British Council for distribution abroad. Each number contains, in addition to valuable summaries of British research papers of medical interest, a special summary of recent work in some field of inquiry, which is written by an authority on that subject. Prof. H. J. Seddon, in an issue devoted to peripheral nerves, writes upon peripheral nerve injuries (*Brit. Med. Bull.*, 1, No. 7; 1943). Clinical problems presented by nerve injuries have not, he says, received great attention except during times of war, when injuries of peripheral nerves are commoner than they are in normal times. The increasing mechanization of our civilization may, however, result in an increase of peripheral nerve injuries even in times of peace. In 1940 the Ministry of Health and the Medical Research Council established, at civilian hospitals in the Emergency Medical Service,

five centres for the treatment of nerve injuries, three in England and two in Scotland. Similar centres have been organized in Natal, India and the Middle East. Treatment often extends over long periods and rehabilitation is both general and specific, the former being designed to keep men fit mentally and physically and the latter to encourage fine co-ordinated movements and the recovery of tactile discrimination. It is often possible for a man to return to work or to military service before recovery is complete. R.A.F. pilots are even able to return to operational flying before they have completely recovered. While complete restoration of function occurs in only a minority of cases, it is remarkable how many patients are able either to return to their former work or to train for new jobs.

Research is also carried out at these beneficent centres. It provides a check on the efficacy of the treatment given and a clearer definition of the various types of injury. Much information is obtained by special methods of examination which could not be obtained in any other way. Animal experiments are also used, and Prof. Seddon thinks that only the balanced combination of this and clinical observation can provide steady progress. The help of the modern highly-trained veterinarian might well be enlisted here. Between three and four thousand cases have already been treated at these centres and, as Prof. Seddon says, the mass of information which is being obtained should greatly advance this branch of neurology.

### Emergency Lighting Systems

A PAPER on the applications of emergency lighting systems with particular reference to battery equipments was read before the Institution of Electrical Engineers in London on November 11 by Mr. S. H. Chase, who pointed out that in recent years there has been an increasing call for the installation of emergency lighting systems. These can be provided by candles or nightlights, gas, dry- or wet-battery torches, accumulators, engine-generator sets, alternative independent mains supply, or by a combination of several methods. The amount of emergency lighting may range from an intensity equal to normal down to the minimum considered necessary for safety and continuation of essential services. The paper deals mainly with the use of accumulators for standby purposes, operated either manually or automatically upon failure of the mains supply, and capable of supplying loads for varying periods according to the class of installations, which are grouped under five heads: theatres and cinemas, hospitals and nursing homes, public buildings, etc., factories and A.R.P. services.

### Modern Insulating Materials

IN a paper on "The Control, Specialized Testing and Use of Some Modern Insulating Materials", Mr. A. R. Dunton (*J. Inst. Elec. Eng.*, 90, Pt. 1, No. 35; Nov. 1943) deals briefly with the details associated with the control of incoming materials to the factory, together with some special features associated with tests which have to be carried out in order that the performance of the materials under special conditions can be ascertained. To achieve this work, special testing apparatus has been designed from time to time, and brief reference is made to some of the problems which have to be solved in order to ensure that the insulating materials selected will fulfil the performances required. Suggestions are also made

dealing with the question of finding substitutes for insulating materials in short supply, and some of the new materials introduced for this purpose are mentioned.

### Announcements

DR. R. E. PRIESTLEY, vice-chancellor of the University of Birmingham, has been appointed an additional member of the Commission on Higher Education in the Colonies. The appointment has been made in consideration of the fact that Prof. A. V. Hill's absence in India makes it impossible for him to take part in the proceedings of the Commission for some time.

DR. H. W. THOMPSON, lecturer in chemistry in the University of Oxford, will deliver the Tilden Lecture of the Chemical Society on January 20 at 2.30 p.m.; he will speak on "The Scope and Limitations of Infra-Red Measurements in Chemistry".

THE trustees of the Miners' Welfare National Scholarship Scheme, established by the Miners' Welfare Commission for the provision of university scholarships for workers in or about coal mines and their sons and daughters, have appointed Principal J. F. Rees, of the University College of South Wales and Monmouthshire, Cardiff, to be a member of the selection committee to recommend awards under the scheme, in succession to Prof. J. F. Duff, who has retired after completing five years on the committee.

THE Therapeutic Corporation of Great Britain has elected the following officers for the year 1944: *Chairman, Board of Directors*: Mr. H. Jephcott (Glaxo Laboratories, Ltd.), (succeeds Dr. T. B. Maxwell, May and Baker, Ltd.); *Deputy Chairman, Board of Directors*: Dr. F. H. Carr (The British Drug Houses, Ltd.), (succeeds Mr. H. Jephcott, Glaxo Laboratories, Ltd.); *Chairman, Research Panel*: Dr. A. J. Ewins (May and Baker, Ltd.), (succeeds Dr. F. L. Pyman, Boots Pure Drug Co., Ltd.); *Deputy Chairman, Research Panel*: Mr. F. A. Robinson (Glaxo Laboratories, Ltd.), (succeeds Dr. J. W. Trevan, The Wellcome Foundation, Ltd.). The Corporation has appointed Dr. Frank Hartley as secretary, to take up duties early in 1944. The new offices of the Corporation are at General Buildings, 99 Aldwych, W.C.2.

A COURSE of twelve lectures on "The Psychology of Frustration and Fulfilment in Adolescence" has been arranged by the National Council for Mental Hygiene. They are being delivered in the Caxton Hall, London, S.W.1, on Tuesdays, beginning January 18, at 5.15 p.m. The lectures are specially addressed to those with social and educational interests. Dr. J. A. Hadfield will speak on the psychology of adolescence; Dr. Paula Heimann on the psychoanalytic approach; Mr. R. W. Moore, headmaster of Harrow School, and Mr. T. F. Coade, headmaster of Bryanston School, will discuss the teacher's approach to the problems of the adolescent boy; Miss L. V. Southwell, headmistress of St. George's School in Switzerland, will deal with the adolescent girl in boarding schools; and Miss Olive Willis, headmistress of Downe House, Newbury, will discuss the teacher's approach to the problems of the adolescent girl. Tickets (single lectures, 3s. 6d.; course, £1 10s.) can be obtained from the Secretary, National Council for Mental Hygiene, 39 Queen Anne Street, London, W.1.

## LETTERS TO THE EDITORS

The Editors do not hold themselves responsible for opinions expressed by their correspondents. No notice is taken of anonymous communications.

### Adsorption as the Cause of the Phenomenon of the 'Floating Drop', and Foam consisting solely of Liquids

DROPS of a liquid may be floating on the surface of the same liquid before coalescence occurs. This 'phenomenon of the floating drop', as it may be called, was apparently first described by O. Reynolds in 1881. It was investigated by E. Kaiser (1894) and explained as due to the presence of an air layer between the drop and the surface of the bulk liquid. L. D. Mahajan, in numerous papers (1929-34), studied the phenomenon, concluding that it was due to a 'cushion' of air or other surrounding medium (kerosene or olive oil); the more viscous this medium, the more stable are the drops. F. H. Hazlehurst and H. A. Neville<sup>1</sup> extended the study to drops floating on a surface of another liquid. They rejected the previous interpretations, and assumed "that the surface of any liquid is quasi-solid, being composed of crystallites".

Having given a good deal of attention to this phenomenon—primarily without knowledge of the previous work—we have been led to the general view that the phenomenon of the floating drop is caused by the adsorption of a foreign substance at the surface of the liquid; the greater the viscosity appearing at the surface, the higher is the stability of the phenomenon.

Some observations supporting this view may now be given. Ethanol, considered earlier to be one of the most effective liquids in showing the phenomenon, was found to give floating drops lasting about 8.0 sec. in ordinary air (Fig. 1). In dry air the life-time of the drops was only 0.7 sec. Hence, in ethanol, the phenomenon is essentially due to the adsorption of moisture from the air. In an evacuated apparatus the phenomenon disappears entirely. Hence, the (less marked) phenomenon still appearing in dry air must be caused by the adsorption of air. This was further supported by the fact that a thin (0.4 mm.) ethanol jet in air, when so long (more than 30 mm.) that no floating drops appeared, gave rise to numerous air bubbles in the bulk liquid; when the length was less than 30 mm., with a lot of floating drops appearing, the air bubbles ceased to appear.

In saponin solutions the life-time ( $\tau$ ) of the drops was found to be a function of the concentration (Fig. 2, I), with a maximum at 1 per cent. This is quite similar to that of known adsorption isotherms. If, immediately before the timing observations, a series of rapid droppings was made, the stability of the drops considerably increased (series II). This must be ascribed to an accumulation on the flat surface of saponin adsorbed on the drops, and evidence of the importance of adsorption.

Our observations emphasize the analogy between the



Fig. 1.

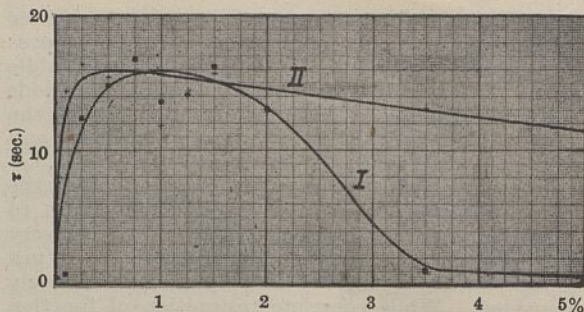


Fig. 2.

phenomenon of floating drops and the formation of bubbles or foam. As a matter of fact, pure liquids are known not to foam; the main factor is adsorption, exerted by a capillary active substance; a high stability presupposes a certain viscosity of the adsorbed layer.

Saponin solutions, as is well known, form in air a rather stable foam. We observed that foam is formed by a saponin solution kept in an evacuated vessel, but the stability of this foam was found to be much lower than in air. Hence, we may conclude that foam, under ordinary conditions, is partly stabilized by an adsorbed layer of air.

In a similar way, the considerable stability of floating saponin drops must partly be due to adsorbed air: in an evacuated vessel, saponin solutions—under the conditions used—actually gave no floating drops.

Fresh malt beverage was found to give persistent

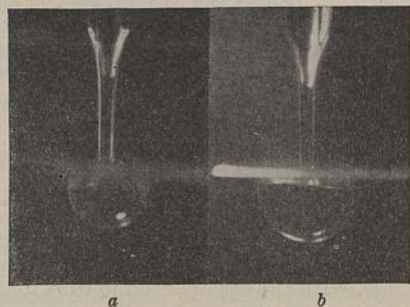


Fig. 3.

floating drops (up to 28.6 sec.). When the carbon dioxide had been removed *in vacuo*, however, the life-time was only 0.2 sec. This is parallel to the fact that the foaming ceases when carbon dioxide is removed. Hence the adsorption of carbon dioxide in both cases exerts a considerable influence.

Saponin solutions were found to give persistent floating drops not only in air but also in nitrogen and in oxygen as well; the stability was greater in nitrogen.

The explanation given by Kaiser and by Mahajan, implying that the phenomenon is caused by a thin foreign layer, obviously is in good harmony with our statement of the influence of adsorption. As for the assumption of Hazlehurst and Neville—implying that the 'foreign' layer would be composed of crystallites of the pure liquid itself—this appears now unnecessary and is scarcely in harmony with the fact that the phenomenon does not occur *in vacuo*.

With saponin solution, it was found possible to form rather large floating drops (11 mm. in diameter) by successively dropping on single drops. The foreign 'adsorbed' layer necessary may also be realized by using a thin layer of oil, spread on a water surface. When dropping on water, very large floating drops may be produced, as evidenced in Fig. 3, showing drops formed by the coalescence: in *a* of 30 single drops, in *b* of about 80 drops (diameter 16 mm.). These fairly stable spherically limited masses of water in water with an extremely thin oil layer remind one of the spherical oil masses in alcohol of the same density produced by Plateau.

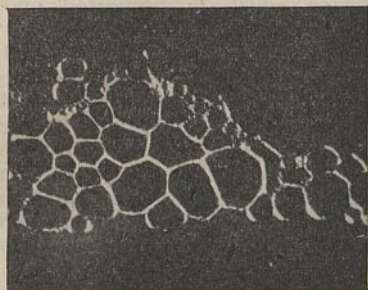


Fig. 4.

We were further led to the production of a foam, consisting solely of liquids. Such a 'liquid-foam' is evidenced by Fig. 4. The cell walls are saponin solution (0.5 per cent), the cell content is oil ('Light-house', Pratt), which has been introduced into the saponin solution—kept at the bottom of a thin cuvette.

The appearance of the fluid-foam was very similar to the 'gas-foam' formed in the same cuvette on introducing air into the saponin solution.

The main interest of the fluid-foam is that it affords a rather close analogy with the capillary grain structure of solid metals<sup>2</sup>.

A detailed account of this work will appear in *Arkiv för Matematik, Astronomi och Fysik*, vol. 30 A, of the Royal Swedish Academy of Sciences, Stockholm.

CARL BENEDICKS.  
PER SEDERHOLM.

Laboratorium C. Benedicks,  
Metallografiska Institutet,  
Stockholm.

<sup>1</sup> Hazlehurst and Neville, *J. Phys. Chem.*, **41**, 1205 (1937).

<sup>2</sup> Cf. Benedicks, 18<sup>e</sup> Congrès de Chimie Indust. (Nancy, 1938). *Chimie et Industrie* (Paris, 1939). *Koll. Z.*, **91**, 217 (1940).

## Interpretation of Patterson Diagrams

PROF. J. MONTEATH ROBERTSON'S communication on the above subject in *NATURE*<sup>1</sup> suggests a modified method, based on the same geometrical principle.

I refer now to the diagram in Prof. Robertson's communication. Let  $AA'$  and  $BB'$  be opaque screens pierced in the points 1, 2, . . . and 1', 2', . . . respectively. If  $AA'$  is illuminated from the left, the peaks in the Patterson diagram will appear on the surface  $CC'$ .

The two screens  $AA'$  and  $BB'$  can be rapidly prepared by punching circular holes in sheets of cardboard. The holes form the pattern of the projected atomic positions and the pattern on  $AA'$  may be drawn to a scale twice as large as that of the pattern on  $BB'$ . In this case the distance from  $AA'$  to  $BB'$

should be equal to the distance from  $BB'$  to  $CC'$ . The unit area will then be the same on  $AA'$  as on  $CC'$ . The integrated intensity of a projected Patterson peak will be proportional to the product of the areas of the two corresponding holes. If the distances between the screens are large compared with the extension of the atomic patterns, and if the holes in  $AA'$  and  $BB'$  are made to correspond to atomic contours, the contours of the Patterson peaks will be practically circular and the diameter of a circle will be the sum of the diameters of the two corresponding atom holes in  $AA'$ . Important features of the real Patterson function are thus rather closely attained.

The projection surface  $CC'$  is preferably a ground-glass plate, which is viewed from the right. The contours of the real Patterson diagram can be drawn on the ground-glass surface, thus enabling an easy comparison with the projected picture.

Compared with Prof. Robertson's method, the modified method outlined here lacks the possibility of continuous variation. However, the variation can be carried out quite rapidly, and the modified method seems to possess certain advantages in other respects.

G. HÄGG.

Chemical Institute of the University,

Uppsala.

Nov. 3.

<sup>1</sup> *NATURE*, **152**, 411 (1943).

## A New Type of Microphotometer

UNDER this title<sup>1</sup> R. Fürth gave a short description of an instrument designed for providing a practically instantaneous record on a cathode ray oscillograph of the density distribution along a short straight line on a photographic plate. This record was in fact obtained by the superposition of two traces writing in opposite directions on the screen of the cathode ray oscillograph, corresponding to the two directions of the vibrational motion of the plate through the slit image. A rather thick curve resulted, therefore, with loss in detail compared with the records of other existing types of microphotometers. In addition, fluctuations in frequency of the mains voltage by which the instrument is operated could cause slight displacements of the two traces<sup>2</sup>.

A brief description is given here of an improvement on Fürth's microphotometer which has resulted in an increased resolving power and more satisfactory working conditions. It consists in the application between grid and cathode of the cathode ray tube of a periodic 'square wave' voltage which controls the brightness of the fluorescent spot on the screen in such a way as to make only one trace visible. To produce this voltage (which must be properly related to the time-base voltage) an electrical circuit is used which is comprised mainly of a 90° phase-shifting network with an amplifier the output of which is applied to a peak-clipping device.

In order to demonstrate the improved performance of the instrument, three photographic records are shown relating to the density distribution in a photograph of the arc spectrum of copper in the neighbourhood of 3440 Å., taken with an ordinary glass spectrograph. Records 2 and 3 (with original magnification of 30) each cover a range of 15 Å. approximately. Record 1 is of the central hump in record 2; it corresponds to an original magnification of 200 and covers a range of 2.2 Å., and a distance of 0.24 mm.



1



2



3

on the spectrum photograph. On the oscillograph screen a distance of 1 mm. corresponded to 0.3 A. in records 2 and 3 and to 0.045 A. in record 1.

These curves, in addition to giving evidence of the increased resolving power now available with the aid of this device (as will be seen by comparison with the first note on the microphotometer quoted above), serve to illustrate how the magnification of the instru-

ment can be altered at will to study more closely any portion of the photometric curve.

A more detailed description of the device will be published elsewhere shortly.

R. W. PRINGLE.

Department of Mathematical Physics,  
University,  
Edinburgh.

<sup>1</sup> Fürth, R., NATURE, 149, 730 (1942).

<sup>2</sup> Fürth, R., Proc. Phys. Soc. London, 55, 34 (1943).

## Meiosis of a Triple Species Hybrid in Gossypium

SKOVSTED<sup>1,2</sup> brought forward considerable cytological evidence that New World ( $n = 26$ ) cottons originated by amphidiploidy from crosses between ancestral Asiatic ( $n = 13$ ) and American ( $n = 13$ ) parents. Recently Harland<sup>3</sup> and Beasley<sup>4</sup> have independently synthesized by colchicine treatment amphidiploids from hybrids between present-day Asiatic and American diploid species. Since the synthesized amphidiploids produce partly fertile hybrids on crossing with present-day New World types, they contribute strong supporting evidence to Skovsted's theory. It should be pointed out, however, that such evidence can only be considered critical if it can be shown that genom combinations other than Asiatic + American do not pair equally well with the New World complement. I have brought forward<sup>5,6</sup> phenogenetic evidence which suggests that critical examination of Skovsted's hypothesis may now be confined to testing combinations between Asiatic species and one or other of several entire-leaved species. The following combinations should be worth testing:

- (1) Asiatic (A)\* + *G. aridum* (D)
- (2) Asiatic (A) + *G. klotzschianum* (D)
- (3) Asiatic (A) + *G. raimondii* (D)
- (4) Asiatic (A) + *G. sturtii* (C)

\*Letters indicate genomes according to Beasley's system.

It will be noted that all combinations except the fourth include an American diploid genom. Clearly if *G. sturtii* could be eliminated as a possible ancestor of New World cottons, Skovsted's hypothesis would be considerably strengthened. The low meiotic pairing found by Skovsted<sup>2</sup> in New World  $\times$  *G. sturtii* hybrids (A C D) and the high pairing found by Beasley<sup>7</sup> in the corresponding hexaploid (A C D)<sub>2</sub> certainly do not suggest *G. sturtii* as a possible parent—a conclusion which is supported by the data presented below.

A triploid (A A C) was recently obtained by crossing an autotetraploid Asiatic cotton with *G. sturtii*. The meiotic behaviour of this hybrid has been fully reported elsewhere<sup>8</sup>, when it was shown that homology between A and C genomes was very low. The triploid was treated with colchicine, and pollen from some of the distorted flowers produced during the ensuing abnormal vegetative growth appeared to be viable. New World species were accordingly crossed persistently with pollen from these flowers. A completely sterile hybrid with 52 chromosomes was eventually obtained from 103 attempted crosses. Since it is known that the New World female parent (*G. barbadense*) produced normal 26 chromosome gametes, the gametes from the male parent must also have contributed 26 chromosomes. Furthermore, since the hybrid had the distinctive mauve petal colour of *G. sturtii* and plant hairiness characteristic of the Asiatic type used—neither of which characters was carried by the *barbadense* parent—it was certain that both Asiatic and *sturtii* chromosomes had been included. With the knowledge that unbalanced gametes are very rare in *Gossypium*, and that *sturtii* and Asiatic chromosomes have low homologies, it seems likely that complete A and C genomes were contributed by the male parent. If this is accepted provisionally, the hybrid should have the following constitution:

$$\text{♀} \rightarrow \text{AD/AC} \leftarrow \text{♂}$$

At meiosis the A genomes should pair as bivalents or higher associations, as shown by Skovsted's<sup>1</sup> Asiatic  $\times$  New World hybrids, while the C and D genomes, if their pairing is similar to that found in Skovsted's<sup>2,9</sup> American diploid  $\times$  *G. sturtii* hybrids, should show low and very variable pairing. Univalents should consist of two types—very large from the C set and small from the D set.

Meiotic studies of the hybrid agree reasonably well with expectation:

Cross	Average number of univalents per PMC	No. of PMC's examined
Triple hybrid.....	11.8 $\pm$ 0.8	20
<i>Davidsonii</i> $\times$ <i>sturtii</i>	15.0 $\pm$ 0.8	40
<i>Sturtii</i> $\times$ <i>armourianum</i>	8.5 $\pm$ 0.9	20

} Skovsted's data

Owing to the uniformly high variability, the number of univalents found in each hybrid barely differs significantly. A typical first metaphase plate of the triple hybrid is shown in Fig. 1. The great range in size of the univalents is apparent (see also Fig. 2), although I do not consider it possible to classify them all with certainty as C or D types. However, the evidence as it stands is sufficient to demonstrate, under identical cytological conditions, the low homologies existing between Asiatic, New

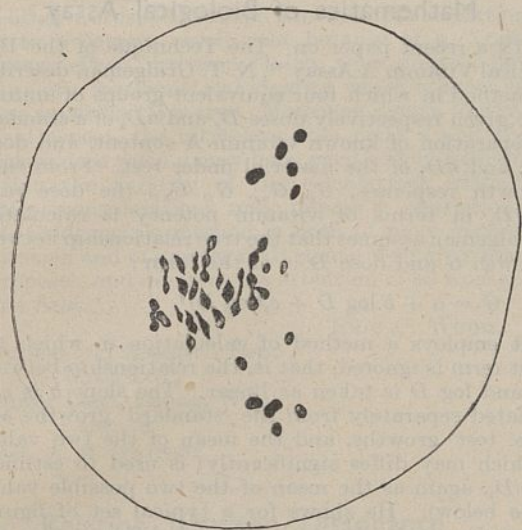


Fig. 1. METAPHASE I IN THE TRIPLE SPECIES HYBRID, *G. barbadosense* × *G. arboreum* × *G. sturtii* (A C D) SHOWING 1 V, 2 IIIs, 14 IIs AND 13 Is. (× 1200).

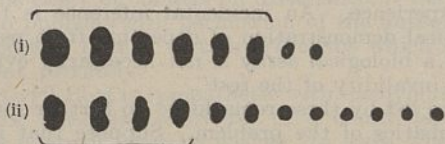


Fig. 2. UNIVALENTS FROM TWO OTHER METAPHASE I PLATES. PROBABLE C UNIVALENTS ARE BRACKETED. (× 1,800).

World, and *sturtii* genomes, and hence *G. sturtii* may be dismissed as a possible parent in the origin of New World cottons.

S. G. STEPHENS.

Genetics Department,  
Empire Cotton Growing Corporation,  
Trinidad.

<sup>1</sup> Skovsted, A., *J. Genet.*, **28**, 407 (1934).

<sup>2</sup> Skovsted, A., *J. Genet.*, **34**, 97 (1937).

<sup>3</sup> Harland, S. C., *Trop. Agric.*, **17**, 53 (1940).

<sup>4</sup> Beasley, J. O., *Amer. Nat.*, **74**, 285 (1940).

<sup>5</sup> Stephens, S. G., *J. Genet.* (in the press).

<sup>6</sup> Stephens, S. G., *NATURE* [153, 53 (1944)].

<sup>7</sup> Beasley, J. O., *Genetics*, **27**, 25 (1942).

<sup>8</sup> Stephens, S. G., *J. Genet.*, **44**, 272 (1942).

<sup>9</sup> Skovsted, A., *J. Genet.*, **30**, 397 (1935).

## Development of Gametocytes from Extra-erythrocytic Forms in *Plasmodium gallinaceum*

It was shown in a previous paper<sup>1</sup> that if fowls inoculated with emulsions of organs containing extra-erythrocytic forms of *Plasmodium gallinaceum* are subjected to intense and continuous quinine treatment (150 gm./kgm. body weight quinine hydrochloride daily), they eventually become heavily infected with extra-erythrocytic forms in the complete absence of erythrocytic schizogony. During quinine treatment the red cells become infected with small non-pigmented parasites derived directly from extra-erythrocytic forms. These small non-pigmented forms do not develop further unless the quinine is stopped or the dose diminished, in which case they undergo the normal cycle of development in red cells. The same results are obtained in birds subjected to

the bites of infected mosquitoes, *Aedes aegypti*, and to continued intensive quinine treatment. With the interruption of quinine treatment the parasites in the red cells, all derived from extra-erythrocytic forms, undergo normal development which can be readily followed by examining the blood at various intervals.

Discussing these findings with us, Brigadier J. A. Sinton asked whether or not gametocytes are derived from extra-erythrocytic forms.

Experiments on birds infected by the bites of *A. aegypti*, and subjected to intense quinine treatment which was stopped only after red cells were infested with small non-pigmented parasites, showed beyond all possible doubt that among the merozoites produced by extra-erythrocytic forms some invade red cells and develop directly into gametocytes. Young gametocytes can be recognized 27½ hr. after the cessation of quinine, and they approach their maximum size before the first cycle of erythrocytic schizogony is completed.

S. ADLER.

I. TCHERNOMORETZ.

Department of Parasitology,  
Hebrew University,  
Jerusalem.  
Nov. 7.

<sup>1</sup> Adler, S., and Tchernomoretz, I., *Ann. Trop. Med. and Parasit.*, **35**, 271 (1941).

## Effect of *p*-Amino-Benzoic Acid on the Toxicity of *p*-Amino-Benzene-Sulphonamide to Higher Plants and Fungi

Most of the published observations on the antagonism between *p*-amino-benzoic acid and *p*-amino-benzene-sulphonamide relate to the growth of bacteria, but work carried out in these laboratories and elsewhere shows that this antagonism also obtains with higher plants and fungi.

Working with isolated tomato roots growing in tissue culture, Bonner<sup>1</sup> has described a growth inhibition caused by *p*-amino-benzene-sulphonamide which is reversed in the presence of *p*-amino-benzoic acid. More recently I have observed a similar response from complete plants growing under more natural conditions. In a series of experiments connected with the control of seed-borne fungoid diseases of wheat, the following observation was made. *p*-Amino-benzene-sulphonamide in fine powder form was applied to wheat at the rate of 0.01 per cent, and the grains were sown in soil. The emergence was markedly reduced, and those plantlets which did emerge were stunted. If the grains are soaked in aqueous solutions of *p*-amino-benzene-sulphonamide and are subsequently sown in moist sand at 22° C., percentage germination after five days is not affected, but the coleoptile and roots are stunted. Addition of *p*-amino-benzoic acid to the aqueous solution of *p*-amino-benzene-sulphonamide cancels this stunting effect, as is shown by the series of experiments recorded in Tables 1 and 2.

TABLE 1. MEAN PERCENTAGE GERMINATION OF WHEAT SEEDS: FIVE DAYS AT 22° C.

Concentration of <i>p</i> -amino-benzene-sulphonamide solution	Concentration of <i>p</i> -amino-benzoic acid			
	Nil	0.1 p.c.	0.25 p.c.	0.5 p.c.
Nil	100.0	100.0	100.0	100.0
0.5 per cent	100.0	97.3	98.6	100.0
1.0 per cent	100.0	98.6	100.0	96.0

TABLE 2. MEAN COLEOPTILE LENGTH (mm.) OF WHEAT SEEDLINGS.

Concentration of <i>p</i> -amino-benzene-sulphonamide solution	Concentration of <i>p</i> -amino-benzoic acid			
	Nil	0.1 p.c.	0.25 p.c.	0.5 p.c.
Nil	50.8	46.5	50.0	41.6
0.5 per cent	7.4	9.4	26.3	38.6
1.0 per cent	7.3	7.9	20.4	35.3

This result naturally led to the extension of the work to cover fungi as well as higher plants, but here it was found from the literature that Dimond<sup>2</sup> had already observed that *p*-amino-benzene-sulphonamide had a retarding effect on the dermatophytic fungus *Trichophyton gypseum*, which is antagonized by *p*-amino-benzoic acid. However, I have found that *p*-amino-benzene-sulphonamide has also a delaying effect on the early stages of germination and growth of the fungi *Penicillium digitatum* Sacc., *Fusarium caeruleum* (Lib.) Sacc. and *Botrytis Allii* Munn. This initial delaying effect is eliminated by very small concentrations of *p*-amino-benzoic acid. Various concentrations of *p*-amino-benzene-sulphonamide and *p*-amino-benzoic acid were included in a synthetic agar medium (Raulin-Thom) in Petri dishes. The surface was spread with a spore suspension, the plates incubated at 25° C., and the amount of growth recorded at intervals in arbitrary units. Addition of *p*-amino-benzoic acid alone in no way affected the growth of the fungi. Results of a typical experiment are shown in Table 3.

TABLE 3. EFFECTS OF *p*-AMINO-BENZOIC ACID AND *p*-AMINO-BENZENE-SULPHONAMIDE ON GROWTH OF *Penicillium digitatum*.

Concentration of <i>p</i> -amino-benzene-sulphonamide in medium (p.p.m.)	Concentration of <i>p</i> -amino-benzoic acid in medium (p.p.m.)					
	At 3 days incubation			At 7 days incubation		
	Nil	10	100	Nil	10	100
Nil	++	++	++	++	++	++
12.5	+	++	++	++	++	++
25	+	++	++	++	++	++
50	—	++	++	++	++	++
100	—	++	++	++	++	++

— no growth.  
+ reduced growth.  
++ normal growth.

The generally accepted explanation of the antagonism between *p*-amino-benzoic acid and *p*-amino-benzene-sulphonamide, developed by Woods<sup>3</sup> and Fildes<sup>4</sup>, is that *p*-amino-benzene-sulphonamide inactivates bacteria by virtue of a competitive inhibition of an enzyme reaction involving the utilization of *p*-amino-benzoic acid. From the results with higher plants and fungi now reported, it would appear, if the hypothesis of Woods and Fildes is accepted, that the enzyme reaction concerned is common to several widely distinct types of living organism. This suggests that it may eventually be found to be associated with some metabolic process of fundamental importance to living matter.

P. W. BRIAN.

Imperial Chemical Industries Limited,  
Hawthorndale Laboratories,  
Jealott's Hill Research Station,  
Bracknell, Berks.  
Dec. 2.

<sup>1</sup> Bonner, J., *Proc. U.S. Nat. Acad. Sci.*, 28, 321 (1942).  
<sup>2</sup> Dimond, N. S., *Science*, 94, 420 (1941).  
<sup>3</sup> Woods, D. D., *Brit. J. Exp. Path.*, 21, 74 (1940).  
<sup>4</sup> Fildes, P., *Lancet*, 1, 955 (1940).

### Mathematics of Biological Assay

In a recent paper on "The Technique of the Biological Vitamin A Assay"<sup>1</sup>, N. T. Gridgeman describes a method in which four equivalent groups of animals are given respectively doses  $D_1$  and  $nD_1$  of a standard preparation of known vitamin A content, and doses  $D_2$  and  $nD_2$  of the material under test. From their growth responses,  $G_1, G_{n1}, G_2, G_{n2}$ , the dose ratio  $D_1/D_2$  in terms of vitamin potency is calculated. Gridgeman assumes that the true relationship between growth  $G$  and dose  $D$  is of the form :

$$G = a + b \cdot \log D + c \cdot (\log D)^2, \dots \dots (1)$$

but employs a method of calculation in which the last term is ignored, that is, the relationship between  $G$  and  $\log D$  is taken as linear. The slope  $b$  is calculated separately from the 'standard' growths and the 'test' growths, and the mean of the two values (which may differ significantly) is used to estimate  $D_1/D_2$ , again as the mean of the two possible values (see below). He shows for a typical set of figures that the result obtained does not differ, within the accuracy of the arithmetic, from the true value, and concludes: "This compensatory effect operates over fairly wide limits: it certainly covers all curves in our experience. An incidental inference is that a statistical demonstration of departure from parallelism in a biological assay is not necessarily evidence of the invalidity of the test".

I was led by these remarks to go further into the mathematics of the problem. Suppose that in the most general case the relationship between  $G$  and  $D$  is :

$$G = a + b \cdot \log D + c \cdot (\log D)^2 + d \cdot (\log D)^3 + \text{etc.} \quad (2)$$

Assume also that in a particular assay the true value of the ratio  $D_1/D_2$  is  $q$ . Following Gridgeman's method of evaluating this ratio,  $b$  is estimated as the mean of  $(G_{n1} - G_1)/\log n$  and  $(G_{n2} - G_2)/\log n$ , that is,  $(G_{n1} + G_{n2} - G_1 - G_2)/2 \log n$ . Denote this by  $b_e$ . The two available estimates of  $D_1/D_2$ , namely, antilog  $(G_1 - G_2)/b_e$  and antilog  $(G_{n1} - G_{n2})/b_e$  are averaged for the final estimate, which is thus obtained from the equation :

$$\log \frac{D_1}{D_2} = \log n \left( \frac{G_{n1} + G_1 - G_{n2} - G_2}{G_{n1} - G_1 + G_{n2} - G_2} \right) \dots (3)$$

Now express the various  $G$ 's as functions of the corresponding  $D$ 's from equation (2); replace  $\log n \cdot D_1$  by  $(\log n + \log q + \log D_2)$ , and similarly for  $\log D_2, \log n \cdot D_2$ ; and expand second degree and higher terms where necessary. The resulting algebra is tediously lengthy, but many of the simpler terms cancel out, and the bracketed part of (3) reduces to :

$$\frac{\log q(2x + y_1)}{\log n(2x + y_2)} \dots \dots \dots (4)$$

where  $x = b + c(\log q + \log n + 2 \log D)$ , and  $y_1, y_2$ , are multinomials the coefficients of which are  $d$  and higher coefficients from (2).

Now over at least that part of the  $(G, \log D)$  curve which is used in practice, and remembering the error inherent in biological assays, Gridgeman is perfectly justified in assuming the truth of equation (1), that is, in neglecting third and higher powers of  $\log D$  in (3). This is equivalent to putting  $y_1 = y_2 = 0$  in (4), and (3) then becomes :

$$\log \frac{D_1}{D_2} = \log n \left( \frac{\log q \times 2x}{\log n \times 2x} \right) = \log q, \text{ the true value.}$$



In other words, Gridgeman's method of calculation leads to a correct result, not because of a "compensatory effect" between "fairly wide limits", but because of a mathematical identity which is exact so long as equation (1) is true. Moreover, from a mathematical aspect, the intraclass dose ratio  $n$  and the interclass dose ratio  $q$  may both vary widely without affecting the validity of the calculations (though practical considerations may impose a restriction). Thus, Gridgeman's method is both of more general application and of greater mathematical rigidity than he supposes, and deserves the attention of all workers in this field.

ERIC C. WOOD.

Analytical and Research Dept.,  
Virology, Ltd.,  
Hanger Lane, Ealing, W.5.  
Dec. 8.

<sup>1</sup> *Biochem. J.*, **37**, 127 (1943).

### Relation between Dissonance and Context

IN view of the discussion with Mr. C. G. Gray<sup>1</sup> about the effect of context on dissonance, it may be useful to publish, with permission of the authors of the respective letters, certain criticisms which have been sent privately.

Prof. Cyril Burt is sympathetic with the hypothesis "that the dissonant character of a chord depends upon its context", but he wishes "to learn whether the musical experience and proclivities of the subjects made any difference to their reports". He himself attempted to test Helmholtz's theory of harmony "by means of correlating orders of dissonance and orders of pleasantness", and found that "the lack of correlation differed according to the musical experience of the examinees. Nearly everybody would rank the pleasantness of a major third far too high for the effect to be explained by absence of beats; but a few modern people would rank a tritone quite near the top. In fact, it seemed clear that, in ranking chords for their pleasantness, a large number of examinees were ranking them for their 'interesting' character. Thus an open fifth, though, according to Helmholtz's principles it should make a very good consonance, would be put near the bottom because it was devoid of interest". "Here again," he writes, "context makes all the difference. Beethoven's open fifth at the beginning of the Ninth Symphony actually heightens one's interest and curiosity just because of its non-committal character. In fact, here it almost seems to act like a dissonance. One seems to want a resolution in the sense of a major or minor third, so that one can at last feel assured what the actual key is going to be."

Dr. H. Banister is concerned about the effect of the equal temperament of the modern piano upon the character of chords, and thinks that it is not possible to assume, as Gardner and Pickford did, that a discord remains identical in dissonance when transposed in sequence. He, like Prof. Burt, also wishes to be assured that the subjects of the experiment were really judging dissonance and not some other quality, such as "interestingness". He thinks Helmholtz, who was concerned with isolated chords, might possibly have agreed with results in which dissonance-level varied with the context. He wishes to see the results of a more effectively controlled experiment.

Mr. Chalmers Burns finds it surprising that a psychological experiment should be necessary to prove what musicians have known for many centuries, namely, that the harshness of a dissonance depends on the way in which it is used.

Gardner and Pickford, who appreciate these criticisms, cannot say that they were unaware of them beforehand, and if they are able to publish any further interesting experimental results, they will do so; but it is worth saying that one subject in their experiment, who has some musical experience, reported that a certain discord sounded very dissonant until the progression in which it appeared reminded her of Debussy, and then it became consonant. Another subject, who has less musical experience, was unable to find any discords whatever in the whole experiment, though by musicians' standards some of them were certainly very harsh indeed.

R. W. PICKFORD.

Psychology Department,  
University,  
Glasgow, W.2.

<sup>1</sup> *NATURE*, **152**, 570 (1943).

### Future of Quaternions

PROF. E. T. WHITTAKER, in his recent presidential address to the Royal Society of Edinburgh<sup>1</sup>, has revealed the brilliant future which awaits the great Hamiltonian algebra in the domain of relativity.

Hamilton's great step forward in the initiation of his algebra lay in his perception that a vector could be used to indicate *either* a linear *or* an angular displacement. Further, the quaternionic algebra (with altered name) can be generalized to  $n$  dimensions. For example, in four dimensions, it is a vector volume that obeys Hamilton co-equally with the linear vector. There are also present vector planes both in and perpendicular to the three-dimensional constituent. The linear vector in the fourth dimension, taken as a Hamiltonian versor, at once indicates *no* fourth dimensional translation, but rotation in the three-dimensional constituent—the curved path of light.

Prof. Whittaker thinks that it was the physicists who neglected quaternions from their intrinsic mathematical difficulty. My experience has been different in dealing with students. It was the mathematicians who turned from the quaternionic algebra because of its summation of scalar and vector quantities. In view of their ready use of complex algebra, it is not easy to see why that should have occurred.

In conclusion, I would like to give the following extract from Tait's preface to the third edition of his "Quaternions".

"With regard to the future of Quaternions, I will merely quote a few words of a letter I received long ago from Hamilton:—'Could anything be simpler or more satisfactory? Don't you feel, as well as think, that we are on the *right track*, and shall be *thanked* hereafter? Never mind when.' The special form of thanks which would have been most grateful to a man like Hamilton is to be shown by practical developments of his magnificent idea. The award of this form of thanks will, I hope, not be long delayed."

Now Whittaker, heralding the dawn of that day, half a century after Tait gave that quotation from Hamilton, has given both Tait and Hamilton the needed thanks.

W. PEDDIE.

<sup>1</sup> See *NATURE*, **152**, 603 (1943).

## SOCIETY OF AGRICULTURAL BACTERIOLOGISTS

THE Society of Agricultural Bacteriologists shows each year a fresh increment of growth. This is partly due to the increasing attention which is being given to the study of bacteriology in relation to agriculture and partly to a gradual change in the composition of the Society. For some years it has been attracting a steadily increasing number of bacteriologists working in university departments and research establishments of various types, and in industries other than agriculture. Indeed, all the main branches of bacteriology outside the medical field are now represented among the members. The present policy of the Society is, by opening its membership to bacteriologists in different fields and by making contact with other societies and groups interested in the study of microbiology, to assist in the evolution of an association which will represent all the various branches of bacteriology in Great Britain.

The annual conference of the Society was held this year at Leeds during September 8-10. The majority of the papers were concerned with problems associated with the dairy industry, but several other aspects of bacteriology were represented.

The chlorination of sewage and sewage effluents, a practice which may be desirable in special cases of sewage disposal, was the subject of a paper which described the principles involved and gave the results of experiments showing the effect of chlorination on the bacterial population.

Interest in sandbags has led to the development of an accelerated test for textile preservatives. Pieces of treated and untreated fabric are fixed on aluminium frames and partially buried in containers filled with soil; the soil is held at 30° C. and at a constant moisture content so that cellulose-decomposing organisms may become active, and the strength of the samples is tested weekly.

A paper on the *Bacillus subtilis* group in relation to industrial products dealt with the activities of *B. subtilis* (an organism which is frequently identified as *B. mesentericus* or *B. vulgatus*) and of *B. licheniformis* in dairy products, canned foods, bread, sugar juices and other materials. Factors determining the occurrence of the organisms and controlling their growth were described.

A contribution dealing with the bacteriology of potato silage reported that no evidence could be obtained that any of the lactic acid bacteria survive the cooking of the potatoes. It appears that in practice the lactic acid fermentation, on which preservation depends, is due to accidental contamination. Excellent results have been secured by inoculating the cooked tubers with a combination of *Streptococcus lactis* and *Lactobacillus plantarum*.

A study of 'slowness' in cheesemaking has shown that certain cases are due to the occurrence in some milk of a streptococcus which produces a toxin inhibitory to the organisms of the starter. This example of bacterial antagonism was originally described in New Zealand and has now been observed frequently in Britain. The trouble is encountered most commonly when cheese is made from pasteurized milk; if raw milk is used the organisms which it contains can assume the functions of the starter.

Recent work on the pasteurization of milk has thrown new light on the effect of the process on the bacteria of raw milk, and the problem of the keeping

quality of the product has thereby become clearer. The organisms which tolerate the treatment are corynebacteria, streptococci (chiefly *S. bovis* and *S. thermophilus*), micrococci and in certain samples aerobic spore-forming bacilli. Other bacteria are only rarely detected if recontamination does not occur. One paper reported the finding in 4 per cent of supplies of heat-resistant coliform organisms; the infection was traced to incompletely sterilized milking machines. There was some discussion of the bacteriological control of pasteurized milk, a subject which presents several difficulties owing to the conflicting results furnished by different methods. It was clearly brought out that the corynebacteria and many of the micrococci which survive pasteurization are unable to proliferate at 37° C., and their presence in pasteurized milk escapes detection by the plating method unless a lower incubation temperature is used.

Problems incidental to the condensing and drying of milk were discussed. Work on the bacteriology of dried milk powder and whey led to the suggestion that, as an interim standard, the plate count of a good quality roller-dried product, made within fourteen days of manufacture, should not exceed 5,000 per gm.

'Sterilized' milk, which is consumed in considerable quantities in certain parts of England, is not always sterile, and the findings of an investigation of this product were reported. The most important type of deterioration was found to be sweet curdling by spore-forming aerobes such as *Bacillus cereus* and *B. subtilis*. The trouble could not be related to the quality of the original milk or to the severity of the heat treatment, which varies from 30 min. at 218° F. to 1½ hr. at 225° F. in different plants, or to the efficiency with which bottles are sealed. Evidence was obtained that infection originates from inadequately sterilized plant and bottles, and that the organisms secure sufficient oxygen in a properly sealed bottle to allow of their multiplication. Abnormal flavours unaccompanied by visible changes in the milk were found to be produced by *B. thermoacidurans* and *B. circulans*, which may also be introduced from dairy equipment. Other papers dealt with sterilization in dairy practice and with bacteriological standards to be used in estimating the efficiency of the processes.

A case of 'ropy' milk due to a slime-forming coccus has been traced to infection from hay. A survey of samples of new hay showed that dust derived from this material may be a source of several species of bacteria which give rise to the abnormality. Coliform organisms isolated from hay were incapable of producing a slimy condition in milk.

Methods for the examination of milk continue to receive much attention. A recent innovation is the use of electrical methods for the rapid recognition of unsatisfactory milk. Souring is detected by a pH measurement, and mastitis milk, which is alkaline but has a high chloride content, is identified by means of a conductivity tester. Several papers were devoted to the methylene blue and resazurin reduction tests. The reduction of resazurin in pasteurized milk has been found to be unrelated to the plate count of bacteria which survive the heating. On the other hand, if milk shows rapid reduction in the raw state it behaves in the same way after pasteurization, thus suggesting that reducing substances resulting from bacterial activity in the raw milk are an important factor in post-pasteurization resazurin

tests. In the grading of raw milk a considerable proportion of samples are classified differently by the methylene blue test prescribed by the Ministry of Health and the routine resazurin test adopted provisionally by the Ministry of Agriculture, and further work on this problem is necessary. The complete reduction of resazurin has been shown to be generally slower than that of methylene blue in poor quality milk, but in the majority of samples with a good keeping quality it is similar or quicker. A study of the influence on dye tests of cells from the cow's udder has indicated that the amount of winter market milk which is reduced in grade owing to mastitis and late lactation is 4 per cent when the methylene blue test is used and about 10 per cent when the standard resazurin test is employed.

One of the papers on mastitis of the cow suggested the use of the Hotis test in routine laboratory diagnosis. After twenty hours incubation any samples which give a positive reaction are plated. This method, which economizes materials and labour, appears to be equal in reliability to direct plating.

A paper on the bacteriological aspects of blood transfusion discussed problems arising in the storage of blood and the production of plasma, and described methods of ensuring freedom from contaminating organisms. An account was given of the contaminants encountered in practice and of their action on blood and plasma.

The subjects discussed at this meeting of the Society show that problems in applied bacteriology which are largely related to war-time conditions are occupying the attention of the members. The dominant interest is in dairying, an indication of the national importance of milk and its products.

Copies of the Society's *Proceedings* containing the full papers can be purchased from the Hon. Treasurer, L. J. Meanwell, United Dairies, Ltd., Ellesmere, Salop.

## MEASUREMENT OF HEARING AND DEAFNESS

AN article by M. B. Gardner (*Bell Lab. Rec.*, 22, No. 1; September, 1943) gives the results of tests carried out to determine hearing ability. Audiometers for measuring hearing loss vary considerably in arrangement, depending on how they are to be used and on how extensive a test is to be made. One of the models which has been widely used is the 2A audiometer manufactured by the Western Electric Company. It includes an adjustable oscillator as a source of single-frequency tones and an attenuator by which the intensity level of the tone may be varied. The person whose hearing is being tested listens to the tone through a small receiver, and is given a push-button with which he lights or extinguishes a lamp in front of the operator. Normal procedure is to have the lamp lighted as long as the tone is heard, and the patient extinguishes the lamp by releasing the push-button when the tone disappears.

Eight frequencies are provided from 64 to 8,192 cycles, which covers the important range of hearing, and the frequencies are selected as desired by keys on the audiometer. The output circuits for the various frequencies are so arranged that with the attenuator dial set to the point marked zero loss, the output of the receiver is at an intensity corresponding to the threshold of the average ear for that frequency. At this position of the dial the attenuator is inserting

nearly its maximum loss—a small amount of additional loss being provided to enable measurements to be made on those who hear somewhat better than the average. The dial is graduated in 5db. steps. Normal procedure is to set the dial at a level that the patient can certainly hear, and then to reduce it step by step until the tone is no longer audible. The reading of the dial at the last step the patient hears gives his hearing loss at that frequency.

The intensities corresponding to the zero settings of the 2A audiometer, which represent the threshold of hearing for audiometric purposes, were obtained from tests on a group of people of normal hearing between the ages of twenty and thirty. They are on the average 10–15db. higher than the minimum audible pressure values given in an earlier article\*. The objective of these values was to determine the minimum pressures that can be heard by the human ear, rather than the pressures heard under normal conditions by a more average group of people. That the values used by the 2A audiometer are well suited to their purpose is indicated by results obtained at the World's Fair in 1939. The threshold values of the 2A audiometer correspond very closely to those found during this survey.

Although the threshold curve is of fundamental importance in all acoustical work, there is another curve that is of interest, and that at times becomes of critical importance. As the level of a sound is increased above the threshold, the sound becomes louder and louder until the response becomes more that of the sense of feeling. The stimulus is felt rather than heard, and at somewhat higher levels becomes painful. A curve drawn through these pressures, at which the response is one of feeling as well as hearing, gives the so-called threshold of feeling, and marks an upper limit to audible pressures. The area between these two thresholds represents the range of audible sound pressures, and by plotting the results of audiometer measurements on such a field, it is possible to gauge at a glance the relative seriousness of any particular pattern of hearing loss. Charts indicating these two thresholds are usually employed when plotting hearing losses but, on them, the threshold of hearing is represented by a horizontal line near the top, and the threshold of feeling is plotted in decibels relative to the threshold of hearing.

Deafness may be due either to a transmission loss in the three bones of the middle ear, or to a reduced response of the auditory nerves. The former is called 'conductive deafness', and the latter 'nerve deafness'. With nerve deafness the loss usually increases at the higher frequencies. With conductive deafness, on the other hand, the loss is more constant with frequency, and may even be less at the higher frequencies. In addition, both forms of loss may be present, giving what is called mixed deafness. Even when it is not clear from the audiogram which form of deafness is predominant, the two types of deafness may be distinguished by other criteria. As a result of the lack of sensitiveness of the responding system that results from nerve deafness, no response is obtained until the stimulus reaches a certain value. Beyond this value, however, the response increases rapidly with the stimulus; so rapidly, in fact, that at high intensity levels individuals having one normal ear and one nerve-deafened ear judge the sound to be equally loud in either ear. With conductive deafness all sounds, of whatever level, suffer the same loss. The deafened person therefore hears more nearly

\**Bell Lab. Rec.*, 21, No. 10 (1943); see NATURE, 152 (Oct. 16, 1943).

like the normal individual, except that all sounds are reduced in intensity. Such an individual is not nearly so apt to complain of someone shouting too loudly as would the individual who has become affected by nerve deafness.

Those tested were asked to indicate their hearing ability according to five classes: (1) no noticeable difficulty in hearing; (2) unable to understand speech in public places such as churches or theatres; (3) unable to understand speech from a person two or three feet away; (4) unable to understand speech from a telephone; and (5) unable to understand speech under any condition. Their audiograms were then taken and recorded. Such tests were made on some 9,000 persons, and the audiograms of those of each of the five classes were then averaged to discover the amount and type of loss that was responsible for the various inabilities to hear. These results show, in a graph, that the five classes of loss are separated on the average by about 20 db. For those reporting normal hearing, the average loss was about 5 db., while for the other four classes it was 25, 45, 65, and 85 db., respectively, the latter figure corresponding to total deafness for speech.

## STATISTICAL METHODS FOR GOVERNMENT DEPARTMENTS

THE "Memorandum on Official Statistics" issued by the Council of the Royal Statistical Society is a notable document, not merely for its recommendations for the post-war period, but also for the lucid and concise analysis of the pre-war period and the developments in war-time. The analysis of the pre-war period reflects little credit on the organization and method of the Civil Service. Each department collected its own statistics, and inadequate use was made even of the information available. The utilization of statistical material was imperfect and unsystematic, with loss of information and efficiency. No attempt was made to correlate the information with material available in other branches or departments. In only a few of the major departments was there any statistical organization which could be regarded as adequate. The staffing of departments was unsatisfactory in regard to the training of personnel and in certain respects to their status. Nowhere was a knowledge of statistical theory regarded as a necessary qualification for employment in statistical work, and the technical post of 'statistician' was practically unrecognized.

While the committee of the Royal Statistical Society which prepared the Memorandum is of opinion that in the pre-war period a good deal more could have been done by way of the analysis and interpretation of existing material, with great benefit to departments and to Ministers, it recommends that the collection of statistical material should continue, where possible, to be left to those departments and their branches the administrative duties of which bring them into daily contact with persons providing the information, so as to utilize the fund of experience acquired by administrative branches and the friendly relations which many of them have built up with their clientele. The branches may require advice from a co-ordinating statistical branch in the formulation of inquiries and the treatment of results, but the Memorandum is emphatic that the Central Statistical Office which is proposed to effect firm co-ordination

of the statistical work of different departments should not relieve departments of their responsibility for collecting and compiling statistical data. Divorced so far as possible from routine analysis and from administration, it should be charged with the duty of preparing statistics required by the Government, such as the Budget White Paper, by Royal Commissions and by special committees appointed by the Government. It should ensure that as much statistical material as possible is made available to the public, and that all Government statistics are issued with the minimum of delay. It should endeavour to fill gaps in statistical information by advising departments on the desirability of certain lines of inquiry and should undertake research work or loan staff to assist other departments in undertaking such work.

Acting generally as a co-ordinating body, particularly through a small committee selected from the heads of statistical branches in the major departments, the Central Statistical Office should be responsible for the issue of the Statistical Abstracts for the United Kingdom and the "Guide to Current Official Statistics". It is suggested that the Office should also be responsible for the publication of a monthly bulletin of statistics on the lines of the Survey of Current Business issued by the United States Department of Commerce.

These are the principles on which the Memorandum considers the Central Statistical Office set up in 1941 should be reorganized after the War. The effect of the War has in fact been almost universally beneficial to statistics. The shortage of trained statisticians emphasizes the importance of the contribution they can make to the service of the State in the field of both descriptive and mathematical statistics. Some degree of internal training of the employees of statistical branches has been initiated, and increased use is being made of scientific aids to numerical work. There are also signs of a considerable change for the better in the public and departmental attitude towards statistics.

On the fundamental assumption that plans for reconstruction and for social reform will involve an increasing demand for comprehensive statistical information by the Government during the post-war reconstruction period and beyond, the Memorandum makes further recommendations. First, every major department should have a statistical branch under the direction of an administrative officer, and minor departments should either have a smaller unit or work under the guidance of the statistical branch in a major department or of the Central Statistical Office. Next, in regard to staff, certain statistical posts should be of grades equivalent to that of the more senior administrative officers, and the administrative personnel of statistical branches should be recruited from persons with mathematical or statistical qualifications; transfer between departments should be permitted where necessary. An endeavour should be made to post selected junior administrative officers to the statistical branch as part of their training, and technical posts of statistician created where departments consider them necessary. Full opportunity should be given for a technical statistician who showed administrative ability to be transferred to the administrative grade. The system of giving free courses in statistics to selected members of statistical branches should be extended and facilities given for advanced study. Opportunity should be given for members of statistical

branches to become familiar with the practical aspects of the matters with the statistics of which they are dealing.

The Memorandum also recommends transfer of personnel from departments to the Central Office and vice versa and, as already indicated, the staff of the latter should be available for assisting departments. The needs of certain departments for casual assistance should be met by providing the services of a mathematical statistician either by the appointment of a full-time officer, the loan of a suitable officer from the Central Statistical Office or the Department of Scientific and Industrial Research, the use of an advisory panel of experts, or by temporary engagement of a man from industry. The Memorandum particularly welcomes the interchange of expert personnel between industry and the Civil Service, and finally it is recommended that the Central Statistical Office or some other Government organization should ensure that the most effective use is made of modern machine methods.

The position of the Foreign and Colonial Offices, the Dominions Office and the India Office requires special consideration. In the Colonial Office at least, a statistical branch is recommended; but the responsibility for co-ordinating the trade statistics of the various Colonies should remain with the Board of Trade in view of the Board's experience in dealing with all trade statistics.

These proposals are parallel with those advanced on behalf of scientific workers generally, and which have commanded powerful support in recent reports and in debates in the House of Lords. The Memorandum is also in line with recent suggestions for Civil Service reform, including the training and recruitment of staff. Pronouncements of members of the Government in regard to the importance of statistics and the remedying of admitted defects in the existing service warrant the hope that this notable technical contribution to the improvement of the machinery of government will receive the official recognition that it well deserves.

## A GAS-TUBE HARMONIC GENERATOR

**I**n a search for methods of obtaining currents of high and closely controlled frequency for carrier systems, the Bell Laboratories recently investigated the harmonics generated by triggering gas-filled tubes. The studies showed that gas tubes can produce much higher frequencies than had been thought possible, if operated in a new circuit which accelerates the ionization and de-ionization of the tube. The harmonics thus generated provide standard frequencies so high as 25 mc. for calibrating oscillators. The sharp current pulses are useful in testing television systems, for making phase distortion measurements in co-axial cables, and in high-speed triggering devices.

A typical gas tube with grid control is a triode filled at low pressure with mercury vapour or argon gas. If the grid is maintained at a constant negative potential with reference to the hot cathode while the plate potential is increased with reference to the cathode, only a very minute electron current passes to the plate until a critical plate-cathode potential is reached. This critical potential depends on the structure of the tube, the gas used and the magnitude of the grid

potential as well as on the past history of the tube. When the critical potential is reached, an arc forms and the tube current suddenly rises. The voltage across the tube simultaneously decreases if an external load is connected in series with the source, and the tube continues to conduct until the plate voltage falls below a minimum value necessary to maintain the arc. When the arc is extinguished, the gas ions in the tube migrate to the tube elements and the tube finally becomes de-ionized. As the tube becomes de-ionized, the grid again regains control and the above process may be repeated. The time required for de-ionization determines the frequency at which the foregoing cycle may be carried out.

In the new harmonic generator circuit, the grid and plate are both supplied from the same A.C. source. This makes the plate voltage not only decrease to the value required to extinguish the tube, but also continue to a negative value. Likewise the grid voltage becomes negative. The negative potentials, primarily that on the grid, sweep the gas ions quickly from the tube, thus increasing the rate of de-ionization and the maximum frequency at which the tube can operate. An article by L. G. Kerota (*Bell. Lab. Rec.*, 22, No. 2; October 1943) describes the new circuit, its operation and performance.

In one practical application the gas-tube harmonic generator is used to test the fidelity of television-receiving equipment. Because it generates sharp wave fronts of controllable duration, black-to-white signal changes of great rapidity can be obtained. For determining the phase shift of signals in co-axial cables, two gas-tube circuits operate synchronously. Signals from one are used locally, and those from the other are transmitted over a looped line. The phase shift is determined by observing the difference between the wave fronts of the two pulses.

## BIOLOGICAL RESULTS OF THE LAST CRUISE OF THE CARNEGIE\*

**T**HE present publication, the sixth of the series and the fourth devoted to biological reports, includes accounts of the phytoplankton by Herbert W. Graham, the marine algae by William Albert Setchell, polychaetous annelids by Aaron L. Treadwell, the mysids by W. M. Tattersall and, in addition, several smaller papers in various groups.

The phytoplankton samples, chiefly from the open ocean, were taken at the surface, 50 m. and 100 m., and collected by the Pettersen plankton pump. The main contents were diatoms and dinoflagellates. The area investigated is here divided for convenience into three regions: the southern region in the south-eastern Pacific between South America and longitude 120° W., the tropical region extending from Panama and Peru as far west as Guan, and the northern region between Yokohama and San Francisco. All were poor in phytoplankton. In general, the richest samples occurred in water of low temperature, lower salinity, lower pH and higher phosphate content, whereas little correlation could be found between numbers of plant cells and percentage saturation of oxygen, or between number of plant cells and quantity of dissolved silicate. An interesting condition

\* Scientific Results of Cruise VII of the *Carnegie* during 1928-29 under Command of Captain J. P. Ault. Biology, IV. Department of Terrestrial Magnetism. (Pub. 555.) Pp. vi+92. (Washington, D.C.: Carnegie Institution of Washington, 1943.)

was found in the northern region, where all but two samples showed supersaturation in the upper 100 m., the diatom and dinoflagellate populations being very low. This is probably to be explained by the presence of minute photosynthetic organisms not captured in the ordinary filter net.

The mysid collection, described by the late Prof. Tattersall, although not rich in species or individuals (with the exception of *Sirella thompsoni*), is of interest in containing rare and new forms, and the geographical range of those already known has been extended. Two are new to science. One of them represents a new genus named *Carnegieomysis*, only one specimen of which was obtained; it is a curious and anomalous mysid the affinities of which are obscure until the male can be examined. The eyes are peculiar and of a unique character, resembling those of certain euphausians, having the cornea divided into distinct dorsal and ventral parts. In this case, however, the two parts are separated by a groove in which the corneal elements are absent. It is a type of eye which is developed in response to a pelagic habit of life. Apart from the eyes, the most outstanding characters are the form and size of the antennal scales and the shape and armature of the telson.

Shorter papers report on the isopods, halobates, birds, a sponge, echinoderms, insects and mites, pyrosomids and a lizard.

## FORTHCOMING EVENTS

### Saturday, January 15

QUEKETT MICROSCOPICAL CLUB (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 2.30 p.m.—Inaugural meeting at the new meeting rooms, Sir Henry Dale, Pres.R.S., in the chair; Address by Mr. W. E. Watson-Baker, President of the Quekett Club; Special exhibition of members' work.

SHEFFIELD METALLURGICAL ASSOCIATION (at 198 West Street, Sheffield 1), at 2.30 p.m.—Annual General Meeting. Presidential Address.

### Monday, January 17

ROYAL GEOGRAPHICAL SOCIETY (at Kensington Gore, London, S.W.7), at 3 p.m.—Mr. J. N. L. Baker and Mr. E. W. Gilbert: "The Doctrine of an Axial Belt of Industry in England."

INSTITUTION OF ELECTRICAL ENGINEERS (LONDON STUDENTS' SECTION) (at Savoy Place, Victoria Embankment, London, W.C.2); at 7 p.m.—Problems Night.

### Tuesday, January 18

EUGENICUS SOCIETY (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 5 p.m.—Debate: "That the Programme of Social Security set out in the Beveridge Report should be Supported on Eugenic Grounds".

INSTITUTION OF ELECTRICAL ENGINEERS (WIRELESS SECTION) (at Savoy Place, Victoria Embankment, London, W.C.2), at 5.30 p.m.—Discussion on "Comparative Merits of Different Types of Directive Aerials for Communications" (to be opened by Mr. J. A. Smale).

### Wednesday, January 19

ROYAL SOCIETY OF ARTS (at John Adam Street, Adelphi, London, W.C.2), at 1.45 p.m.—Mr. Henry Berry: "London's Water Supply".

INSTITUTE OF FUEL (at the James Watt Memorial Institute, Great Charles Street, Birmingham), at 2.30 p.m.—Mr. R. Whitfield: "Fuel and Metallurgical Furnaces".

GEOLOGICAL SOCIETY (at Burlington House, Piccadilly, London, W.1), at 3 p.m.—Dr. E. B. Bailey, F.R.S.: "Tertiary Igneous Tectonics of Rhum (Inner Hebrides)".

ROYAL METEOROLOGICAL SOCIETY (at 49 Cromwell Road, South Kensington, London, S.W.7), at 4.30 p.m.—Annual General Meeting. Prof. D. Brunt, F.R.S.: "Progress in Meteorology".

### Thursday, January 20

CHEMICAL SOCIETY (at Burlington House, Piccadilly, London, W.1), at 2.30 p.m.—Dr. H. W. Thompson: "The Scope and Limitations of Infra-Red Measurements in Chemistry" (Tilden Lecture).

### Friday, January 21

INSTITUTE OF FUEL (at the Royal Technical College, Glasgow), at 5.45 p.m.—Dr. E. W. Smith: "Education in the Fuel Industries".

### Saturday, January 22

BIOCHEMICAL SOCIETY (at the British Postgraduate Medical School, Ducane Road, Shepherds Bush, London, W.12), at 11.15 a.m.

INSTITUTE OF PHYSICS (ELECTRONICS GROUP) (joint meeting with the Midland Branch of the Institute of Physics) (at the University, Edmund Street, Birmingham), at 2.30 p.m.—Discussion on "Space-Charge and Noise in Radio Valves" (to be opened by Dr. P. B. Moon and Dr. R. R. Nimmo).

## APPOINTMENTS VACANT

APPLICATIONS are invited for the following appointments on or before the dates mentioned:

ASSISTANT MASTERS for (a) CHEMISTRY AND MATHEMATICS, and (b) PHYSICS AND GEOGRAPHY, at the East Ham Technical College—The Secretary for Education, Education Office, Town Hall Annex, Barking Road, East Ham, London, E.6 (January 22).

PRINCIPAL of the Croydon Polytechnic and Evening Institutes—The Education Officer, Education Office, Katharine Street, Croydon (January 24).

LECTURER IN MECHANICAL ENGINEERING—The Principal, Derby Technical College, Normanton Road, Derby (January 24).

SPEECH THERAPIST (full-time)—The Director of Education, Leopold Street, Sheffield (January 25).

LECTURER (man or woman) IN ZOOLOGY—The Principal, Huddersfield Technical College, Huddersfield (January 31).

ENTOMOLOGIST in the Department of Agriculture, Salisbury, Southern Rhodesia—The Official Secretary, Office of the High Commissioner for Southern Rhodesia, 429 Strand, London, W.C.2 (January 31).

LECTURER IN PHYSICS—The School Secretary, St. Mary's Hospital Medical School, London, W.2 (February 1).

PRINCIPAL of the Gloucestershire College of Domestic Science and Training College—The Secretary, County Education Office, Shire Hall, Gloucester (February 5).

REGISTRAR—The Principal, University College of Wales, Aberystwyth (February 10).

CHAIR OF BOTANY tenable at King's College, and CHAIR OF BOTANY tenable at Birkbeck College—The Academic Registrar, University of London, c/o Richmond College, Richmond, Surrey (February 21).

LECTURER IN CHEMISTRY FOR MEDICAL STUDENTS—The Acting Secretary, University Court, Glasgow (February 25).

UNIVERSITY CHAIR OF ANATOMY tenable at St. Mary's Hospital Medical School—The Academic Registrar, University of London, c/o Richmond College, Richmond, Surrey (March 20).

TEMPORARY TECHNICAL ASSISTANT IN FARM ECONOMICS under the Department of Agriculture for Scotland—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. F.1944.A).

ASSISTANT ELECTRICAL ENGINEER for the Nigerian Government Public Works Department—The Secretary, Overseas Manpower Committee, Ministry of Labour and National Service, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. 538).

ELECTRICAL ENGINEER (temporary) for a Government Department at Bath, to deal with the design and installation of loud-speaker and broadcast systems—The Ministry of Labour and National Service, Central (Technical and Scientific) Register, Advertising Section, Alexandra House, Kingsway, London, W.C.2 (quoting Reference No. D.734.A).

ASSISTANT MASTERS for (a) GENERAL SCIENCE with MATHEMATICS, to take charge of laboratories, and (b) ENGINEERING SUBJECTS with MATHEMATICS in Day Technical School and Evening Institute—The Principal, Technical Institute, 28 Beckenham Road, Beckenham, Kent.

TWO SCIENCE TEACHERS, one a male teacher, main subject PHYSICS, with subsidiary Chemistry or Mathematics; the other, male or female teacher for GENERAL SCIENCE, with some Biological background—The Principal, Technical Institute, Rochester.

TWO (full-time) ASSISTANT TEACHERS for (a) SCIENCE and/or MATHEMATICS, and (b) GENERAL TECHNICAL SUBJECTS including Woodwork or Metalwork—The Principal, County Technical College, Stoke Park, Guildford, Surrey.

LECTURER (full-time) in MECHANICAL ENGINEERING to teach up to Higher National Certificate standard—The Principal, Wimbledon Technical College, Gladstone Road, London, S.W.19.

DEMONSTRATOR (full-time or part-time) in PHYSICS—The Secretary, King's College of Household and Social Science, c/o University College, Leicester.

## REPORTS and other PUBLICATIONS

### Great Britain and Ireland

Ministry of Agriculture and Fisheries. Bulletin No. 126: Report on Fungus, Bacterial and other Diseases of Crops in England and Wales for the Years 1933-1942. Pp. iv+100+8 plates. (London: H.M. Stationery Office.) 2s. net. [2412]

Royal College of Surgeons of England. Scientific Report for the Year 1942-1943. Pp. 24. (London: Royal College of Surgeons of England.) [2412]

### Other Countries

Trabajos del Instituto Nacional de Sanidad. Estudio experimental de una cepa apatógena e inmunizante de *Rickettsia prowazekii*, Cepa E. Por Dr. G. Clavero y Dr. F. Pérez Gallardo. Pp. 30. La prueba intradérmica de Giroud en la infección tifoexantemática: Nuestra experiencia personal, técnicas y posibilidades de su aplicación. Por Dr. G. Clavero y Dr. F. Pérez Gallardo. Pp. 66. Investigación del virus tifoexantemático en las ratas de España. Por Dr. G. Clavero y Dr. F. Pérez Gallardo. Pp. 26. Técnicas de Laboratorio en el tifus exantemático. Por Prof. Dr. G. Clavero del Campo y Dr. F. Pérez Gallardo. Pp. 186. (Madrid: Instituto Nacional de Sanidad.) [1712]



# KERFOOTS BACTERIOLOGICAL SUGARS

Prepared under ideal conditions which ensure the utmost possible degree of chemical purity

ARABINOSE · DULCITOL · INULIN  
MALTOSE · SACCHAROSE  
RAFFINOSE · GALACTOSE  
DEXTRINE (Precip. Starch free)  
DEXTROSE (Cryst. Anhyd.)  
LACTOSE · MANNITOL · SORBITOL

Thomas Kerfoot & Co. Ltd.  
Vale of Bardsley · Lancashire

BS1



Hyper-eutectic white iron showing pearlite (half-tone) and cementite (white)

By courtesy of the British Cast Iron Research Association and Mr. H. Morrogh

### TECHNICAL DETAILS

ETCHED IN PICRIC ACID  
MAGNIFICATION—100X  
OBJECTIVE—16 mm. achromat  
N.A. 0.28  
EYEPIECE—5X

ILLUMINATION—Glass slip  
vertical illumination  
LIGHT SOURCE—Arc lamp  
FILTER—Ilford Micro 3 (green)  
PLATE—Ilford Chromatic  
EXPOSURE—5 secs.

## ILFORD PLATES FOR METALLURGICAL RESEARCH

The photography of polished specimens under the microscope requires great skill and perfect technique allied with recording materials of the highest quality.

Ilford Limited have long and carefully studied the requirements of the industrial research worker and from the knowledge accumulated have prepared a comprehensive range of negative materials varying in speed, contrast, colour sensitivity and resolving power—which, as can be seen from the list below, satisfies every requirement of high and low-power photomicrography.

### For Photomicrography of Polished Specimens

#### ILFORD Process Plate

H. & D. 25. For all cases where high resolution is necessary.

#### ILFORD Ortho Process Plate

H. & D. 30. For all cases where high resolution is necessary.

#### ILFORD Chromatic Plate

H. & D. 135. For polished steel sections, in conjunction with a green filter.

#### ILFORD Iso-Zenith Plate

H. & D. 700. For shorter exposures.

#### ILFORD Rapid Process Panchromatic Plate

H. & D. 100. For specimens showing oxide or sulphur films but frequently used for all specimens.

#### ILFORD S.R. Panchromatic Plate

H. & D. 700. A faster plate for coloured specimens.

ILFORD LIMITED · ILFORD · LONDON

## The Policy for Children

£12 a year invested for a child will provide benefits at age 18, 21, or 25. The investment may be made by a parent or friend.

e.g. If the investment is begun within two months of birth it will provide, at age 21, £323 in cash, or a life policy for £1,656.

## The Equitable Life Assurance Society

(founded 1762)

19, Coleman Street, London, E.C.2

No shareholders

No commission

## SECOND-HAND MICROSCOPES



by  
SWIFT, BECK, WATSON,  
BAKER, ZEISS, LEITZ,  
REICHERT, HIMMLER,  
BAUSCH & LOMB, etc.



MICROSCOPES  
BOUGHT for CASH  
OR TAKEN  
IN EXCHANGE

A limited selection available. State requirements.

CLARKSON'S, 338 High Holborn, LONDON, W.C.1  
Opp. Gray's Inn Rd. 'Phone: HOLborn 2149. Estab. over a Century

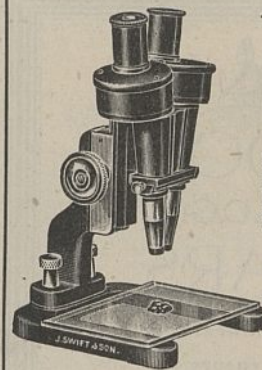
## Meteorological Instruments

MERCURIAL BAROMETERS  
THERMOMETERS  
THERMOGRAPHS  
HYGROGRAPHS

Supplied by Laboratoryfurnishers,  
Scientific Instrument dealers, etc.

**F. DARTON & COMPANY LTD.**

DIAMOND HOUSE, HATTON GARDEN, LONDON, E.C.1



JAMES

**SWIFT**  
& SON LTD.

Manufacturers of

**MICROSCOPES** for

BIOLOGY, MINERALOGY, METALLURGY,  
PHOTOMICROGRAPHIC & PROJECTION  
APPARATUS, GONIOMETERS, REFRACTO-  
METERS, SPECTROMETERS, OPTICAL  
MEASURING & TESTING APPARATUS,  
POLARISING PRISMS & OPTICAL  
ELEMENTS

REPAIRS TO ANY MAKE OF  
ABOVE INSTRUMENTS

Owing to prevailing conditions delivery  
cannot always be guaranteed

81 Tottenham Court Road  
London, W.1

## MANSFIELD OIL-GAS APPARATUS FOR LABORATORIES

This plant is designed to provide a gas supply for  
laboratories which are out of reach of the ordinary  
town's gas supply.

The gas is made in a simple manner from any heavy  
oil, such as paraffin, and gives perfect oxidising and  
reducing flames.

**MANSFIELD & SONS**

Emergency  
Address: 4 Kingsmead Road South, Oxton, Birkenhead

Please ask for particulars of  
**CHRONOGRAPH  
RECORDERS**  
\*  
**BOMB  
CALORIMETERS**  
\*  
**SPECIAL TESTING  
APPLIANCES**

30/-  
Post paid  
U.K.



Write for free  
descriptive pamphlet

"... proved extraordinarily  
useful during the past  
ten years" says yet another user

The Otis King has the calculating  
possibilities of a 66 in. Slide Rule,  
but closes up to fit the pocket.

**Otis King's**  
Patent  
POCKET  
CALCULATOR

**CARBIC LIMITED**

(Dept. N.) 137 Conway Rd., Southgate, London, N.1

**G. CUSSONS LTD**

The Technical Works

**MANCHESTER, 7**

**L. LIGHT & Co. Ltd.**

Old Bowry Laboratories  
WRAYSBURY, BUCKS

Manufacturers of—

DEHYDROCHOLIC ACID

£28 per kg.

SODIUM DESOXYCHOLATE

£35 per kg.

STILBOESTROL

£250 per kg.

Plus 10% for less than 1-kg. lots.



# B-S

## REFRACTOMETERS

Despite wartime difficulties the design of our refractometers is constantly under review. Mechanical and optical improvements, both large and small, are incorporated month by month.

As instances may be quoted: the built-in lamp for back illumination and the polarising eyepiece of the standard refractometer—each giving improved border lines with certain materials; the temperature correction drum for accurate sugar readings; the heat-proof optical system of the projection refractometer, and that instrument itself with its unique design—the absence of telescope and magnifier; the wide range of pocket refractometers.

Improved performance and durability result to the user with great saving of the Nation's time in industry. Yet prices have increased only about 15 per cent during the war period.

**Bellingham & Stanley Ltd., 71 Hornsey Rise, London, N.19**

Telephone: ARChway 2270

GEN

GENATOSAN LIMITED

## UREAS & THIOUREAS

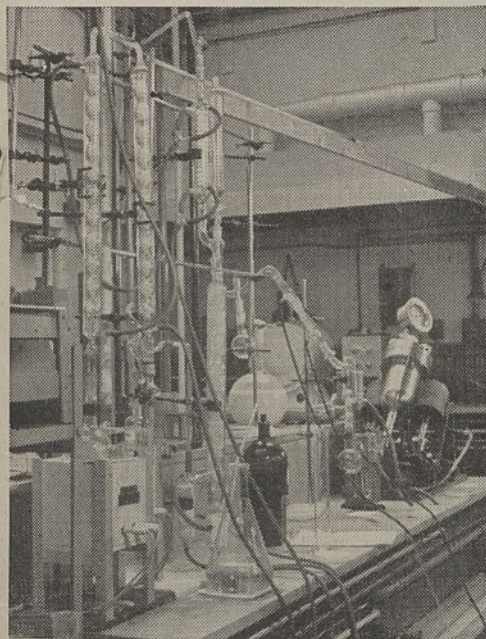
*of the AROMATIC SERIES  
for research and industrial purposes*

We manufacture a variety of aromatic ureas and thioureas, both in our research laboratories and on the plant scale. We are at present making:—

<i>Phenyl Urea</i>	<i>Phenyl Thiourea</i>
<i>α-Naphthyl Urea</i>	<i>α-Naphthyl Thiourea</i>
<i>β-Naphthyl Urea</i>	<i>β-Naphthyl Thiourea</i>
<i>o-, m-, p-Tolyl Ureas</i>	<i>o-, m-, p-Tolyl Thioureas</i>

OTHER MEMBERS of this series could be produced if desired. Enquiries, etc., to:—

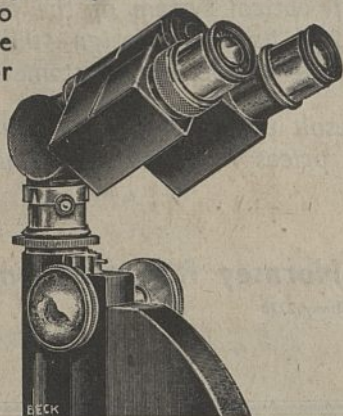
GENATOSAN LTD., LOUGHBOROUGH, LEICS.



## BECK BINOCULAR EYEPIECE ATTACHMENT

### Angular Model

This attachment enables the monocular microscope to be instantly converted into the binocular type. It can be used with any power object glass and has all the qualities of the binocular bodies which are built into the microscope. The inclined angle is a great convenience for those who work with the microscope for prolonged periods.



Catalogue giving full details forwarded on application.

R. & J. BECK Ltd.  
69 Mortimer St.,  
LONDON, W.1

## URGENTLY WANTED

To meet the needs of  
Medical Students

## SECOND-HAND MICROSCOPES

Must be modern and by  
well-known manufacturers

### GOOD CASH PRICES OFFERED

Please send particulars of any instrument  
which can be released to meet these  
ESSENTIAL REQUIREMENTS

### HAWKSLEY & SONS LTD.

17 NEW CAVENDISH STREET, LONDON, W.1  
Telephone: WELbeck 3859    Telegrams: "Diffract, Wesdo, London"



## W. WATSON & SONS, LTD.

are prepared to purchase Second-hand and other Microscopes and allied Apparatus.

FAIR PRICES based upon present values will be given.

Instruments may be sent direct to the address below or a specification forwarded,  
on receipt of which some indication of an offer will be notified.

Please communicate with:

TEMPORARY HEAD OFFICE: 14 Hadley Grove, Barnet, Herts.



## LABORATORY GLASSWARE

HIGH CHEMICAL AND HEAT-  
RESISTING BEAKERS & FLASKS  
OF GUARANTEED QUALITY

VOLUMETRIC GLASSWARE  
ACCURATELY CALIBRATED.

ALL TYPES OF LAMP-BLOWN APPARATUS




WARE IS STOCKED BY THE  
LEADING LABORATORY FURNISHERS

SPECIFY THIS BRAND  
WHEN ORDERING.

CATALOGUES SUPPLIED ON REQUEST

### WOOD BROTHERS GLASS CO. LTD., BARNSELY

TELEPHONE: 3637-8-9 BARNSELY  
TELEGRAMS: "WOODS, BARNSELY"

REGISTERED  TRADE MARK

ESTABLISHED 1828