INDEX TO VOLUME 230 (A)

Angular distribution of multiply-scattered γ-radiation (Soole), 343.
Axisymmetric boundary layer on a long thin cylinder (Glauert & Lighthill), 188.

Barker, J. A. The cell theory of liquids, 390.
Bengough, W. I. & Melville, H. W. A thermocouple method of following the non-stationary state of chemical reactions. II. The evaluation of velocity coefficients and energies of activation for the propagation and termination reactions for the initial and later stages of the polymerization of vinyl acetate, 429.

Bentur, S., Ish-Shalom, M., Lenji, L. & Trocker, Y. The inhibition of the burning of gunpowder by foreign substances, 33.

Benzene vapour, adsorption of by active charcoals (Everett & Whitton), 91.


Binnie, A. M. & Orkney, J. C. Experiments on the flow of water from a reservoir through an open horizontal channel. II. The formation of hydraulic jumps, 237.

Boron atoms, electronic structure of an icosahedron of (Longuet-Higgins & Roberts), 110.

Cell theory of liquids (Barker), 390.
Changes in silicone polymeric fluids due to high-energy radiation (Charlesby), 120.
Charlesby, A. Changes in silicone polymeric fluids due to high-energy radiation, 120.
Charlesby, A. See Alexander & Charlesby.


Chemical and spectroscopic studies of blue flames in the auto-ignition of methane (Gaydon, Moore & Simonson), 1.

Configuration interaction in orbital theories (Nesbet), 312.


Davies, P. O. A. L. See Binnie, Davies & Orkney.

Diamond faces, pressure crack-figures on (Howes & Tolansky), 287, 294.

Eigenvalues of the charge operator (Karlson), 382.

Electronic structure of an icosahedron of boron atoms (Longuet-Higgins & Roberts), 110.

Elliott, R. J. & Lowde, R. D. The inelastic scattering of neutrons by magnetic spin waves, 46.


Ewing, V. C. & Ubbelohde, A. R. Hydrogenation through metal septa, 301.

Excited electronic states of 1, 3-butadiene (Nesbet), 322.

Experimental characteristics of the proton synchroton (Moon, Riddiford & Symonds), 204.
Experiments on the flow of water from a reservoir through an open horizontal channel.
   I. The production of a uniform stream (Binnie, Davies & Orkney), 225.
Experiments on the flow of water from a reservoir through an open horizontal channel.
   II. The formation of hydraulic jumps (Binnie & Orkney), 237.

Feynman principle (Polkinghorne), 272.
Flames, blue, in the auto-ignition of methane (Gaydon, Moore & Simonson), 1.
Flow of water from a reservoir through an open horizontal channel (Binney, Davies & Orkney), 225; (Binnie & Orkney), 237.
Free convection in an open thermosyphon, with special reference to turbulent flow (Martin), 502.

Glauert, M. B. & Lighthill, M. J. The axisymmetric boundary layer on a long thin cylinder, 188.
Gunpowder, inhibition of burning of (Bentur, Ish-Shalom, Lenji & Trocker), 33.

Heat conductivity of superconductors below 1° K (Mendelssohn & Renton), 157.
Horowitz, J. See Abragam, Horowitz & Pryce.
Howes, V. R. & Tolansky, S. Pressure crack-figures on diamond faces. I. The octahedral face, 287.
Howes, V. R. & Tolansky, S. Pressure crack-figures on diamond faces. II. The dodecahedral and cubic faces, 294.
Hydrogen, ortho- and para-, scattering of slow neutrons (Squires & Stewart), 19.
Hydrogenation through metal septa (Ewing & Ubbelohde), 301.

Inelastic scattering of neutrons by magnetic spin waves (Elliott & Lowde), 46.
Inhibition of the burning of gunpowder by foreign substances (Bentur, Ish-Shalom, Lenji & Trocker), 33.
Interference and diffraction of light (Wolf), 246.
Investigation of storm waves in the North Atlantic Ocean (Darbyshire), 560.
Ising problem and Mayer's cluster sums (Rushbrooke & Scoins), 74.
Isothermal Joule-Thomson coefficient of some binary gas mixtures (Charnley, Rowlinson, Sutton & Townley), 354.

Johnson, K. L. Surface interaction between elastically loaded bodies under tangential forces, 531.

Karlson, E. The eigenvalues of the charge operator, 382.
Kemmer, N. & Salam, Abdus. On the relativistic equation for scattering, 266.

Lenji, L. See Bentur, Ish-Shalom, Lenji & Trocker.
Lighthill, M. J. See Glauert & Lighthill.
Lock, W. O. & March, P. V. Nuclear interactions of 600 MeV protons, 222.
Lowde, R. D. See Elliott & Lowde.
Macroscopic theory of interference and diffraction of light from finite sources. II. Fields with a spectral range of arbitrary width (Wolf), 246.
Manning, P. P. The molecular orbital theory of chemical valency. XIX. The charge density function, 415.
Manning, P. P. The molecular orbital theory of chemical valency. XX. The energy in higher approximations, 424.
March, P. V. See Lock & March: also Lock, March, Muirhead & Rosser.
Martin, B. W. Free convection in an open thermosyphon, with special reference to turbulent flow, 502.
Measurement of lattice specific heats at low temperatures using a heat switch (Webb & Wilks), 549.
Melville, H. W. See Bengough & Melville.
Meson theory and nuclear matter (Skyrme), 277.
Meteor radiation, ionization and atomic luminous efficiency (Opik), 463.
Molecular orbital theory of chemical valency. XIX. The charge density function (Manning), 415.
Molecular orbital theory of chemical valency. XX. The energy in higher approximations (Manning), 424.
Moon, P. B., Riddiford, L. & Symonds, J. L. Experimental characteristics of the proton synchrotron, 204.
Morton, K. W. See Abragam, Horowitz & Pryce.
Muirhead, H. See Lock, March, Muirhead & Rosser.

Nesbet, R. K. Excited electronic states of 1, 3-butadiene, 322.
Neutron-diffraction study of the ferroelectric transition of potassium dihydrogen phosphate (Bacon & Pease), 259.
Norman, I. & Porter, G. Trapped atoms and radicals in rigid solvents, 399.
Nuclear interactions of 600 MeV protons (Lock & March), 222.
Nuclear interactions of 950 MeV protons (Lock, March, Muirhead & Rosser), 215.

Opik, E. J. Meteor radiation, ionization and atomic luminous efficiency, 463.
Orkney, J. C. See Binnie, Davies & Orkney; also, Binnie & Orkney.

Pease, R. S. See Bacon & Pease.
Porter, G. See Norman & Porter.
Potassium dihydrogen phosphate, ferroelectric transition of (Bacon & Pease), 359.
Pressure crack-figures on diamond faces. I. The octahedral face (Howes & Tolansky), 287.
Pressure crack-figures on diamond faces. II. The dodecahedral and cubic faces (Howes & Tolansky), 294.
Proton synchrotron, experimental characteristics of (Moon, Riddiford & Symonds), 204.
Pryce, M. H. L. See Abragam, Horowitz & Pryce.

Radiation protection in copolymers of isobutylene and styrene (Alexander & Charlesby), 136.
Radio stars, spatial distribution and nature of (Ryle & Scheuer), 448.
Relativistic equation for scattering (Kemmer & Salam), 266.
Renton, C. A. See Mendelssohn & Renton.
Index 573

Riddiford, L. See Moon, Riddiford & Symonds.
Roberts, M. de V. See Longuet-Higgins & Roberts.
Rosser, W. G. V. See Lock, March, Muirhead & Rosser.
Rowlinson, J. S. See Charnley, Rowlinson, Sutton & Townley.

Salam, Abdus. See Kemmer & Salam.
Scattering of slow neutrons by ortho- and para-hydrogen (Squires & Stewart), 19.
Scheuer, P. A. G. See Ryle & Scheuer.
Scoins, H. I. See Rushbrooke & Scoins.
Significance of reactions of low activation energies to the mechanism of combustion
(Weinberg), 331.
Simonson, J. R. See Gaydon, Moore & Simonson.
Sir Howard Grubb, Parsons & Company (Sisson), 147.
Sisson, G. M. Sir Howard Grubb, Parsons & Company, 147.
Skyrme, T. H. R. Meson theory and nuclear matter, 277.
Soole, B. W. The angular distribution of multiply-scattered γ-radiation, 343.
Spatial distribution and the nature of radio stars (Ryle & Scheuer), 448.
Squires, G. L. & Stewart, A. T. The scattering of slow neutrons by ortho- and para-
hydrogen, 19.
Superconductors, heat conductivity of (Mendelssohn & Renton), 157.
Surface interaction between elastically loaded bodies under tangential forces (Johnson),
531.
Sutton, J. R. See Charnley, Rowlinson, Sutton & Townley.
Symonds, J. L. See Moon, Riddiford & Symonds.

Thermocouple method of following the non-stationary state of chemical reactions II.
The evaluation of velocity coefficients and energies of activation for the propagation
and termination reactions for the initial and later stages of the polymerization of
vinyl acetate (Bengough & Melville), 429.
Thermodynamic study of the adsorption of benzene vapour by active charcoals (Everett
& Whitton), 91.
Tolansky, S. See Howes & Tolansky.
Townley, J. R. See Charnley, Rowlinson, Sutton & Townley.
Trapped atoms and radicals in rigid solvents (Norman & Porter), 399.
Trolcer, Y. See Bentur, Ish-Shalom, Lenji & Troller.

Ubbelohde, A. R. See Ewing & Ubbelohde.

Webb, F. J. & Wilks, J. The measurement of lattice specific heats at low temperatures
using a heat switch, 549.
Weinberg, F. J. The significance of reactions of low activation energies to the mechanism
of combustion, 331.
Whitton, W. I. See Everett & Whitton.
Wilks, J. See Webb & Wilks.
Wolf, E. A macroscopic theory of interference and diffraction of light from finite sources.
II. Fields with a spectral range of arbitrary width, 246.

END OF THE TWO HUNDRED AND THIRTIETH VOLUME (SERIES A)
## CONTENTS

**SERIES A VOLUME 230**

### No. 1180. 12 June 1955

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical and spectroscopic studies of blue flames in the auto-ignition of methane.</td>
<td>A. G. Gaydon, N. P. W. Moore and J. R. Simonson. (Plate 1)</td>
<td>1</td>
</tr>
<tr>
<td>The scattering of slow neutrons by <em>ortho</em> - and <em>para</em>-hydrogen.</td>
<td>G. L. Squires and A. T. Stewart</td>
<td>19</td>
</tr>
<tr>
<td>The inhibition of the burning of gunpowder by foreign substances.</td>
<td>S. Bentur, M. Ish-Shalom, L. Lenji and Y. Trocker</td>
<td>33</td>
</tr>
<tr>
<td>The inelastic scattering of neutrons by magnetic spin waves.</td>
<td>R. J. Elliott and R. D. Lowde</td>
<td>46</td>
</tr>
<tr>
<td>On the Ising problem and Mayer's cluster sums.</td>
<td>G. S. Rushbrooke and H. I. Scoins</td>
<td>74</td>
</tr>
<tr>
<td>A thermodynamic study of the adsorption of benzene vapour by active charcoals.</td>
<td>D. H. Everett and W. I. Whitton</td>
<td>91</td>
</tr>
<tr>
<td>The electronic structure of an icosahedron of boron atoms.</td>
<td>H. C. Longuet-Higgins and M. de V. Roberts</td>
<td>110</td>
</tr>
<tr>
<td>Changes in silicone polymeric fluids due to high-energy radiation.</td>
<td>A. Charlesby</td>
<td>120</td>
</tr>
<tr>
<td>Radiation protection in copolymers of <em>isobutylene</em> and <em>styrene</em>.</td>
<td>P. Alexander and A. Charlesby</td>
<td>136</td>
</tr>
</tbody>
</table>

### No. 1181. 21 June 1955

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sir Howard Grubb, Parsons and Company.</td>
<td>G. M. Sisson. (Plates 2 to 5)</td>
<td>147</td>
</tr>
<tr>
<td>The heat conductivity of superconductors below 1° K.</td>
<td>K. Mendelssohn, F.R.S. and C. A. Renton</td>
<td>157</td>
</tr>
<tr>
<td>On the hyperfine structure of paramagnetic resonance: the <em>s</em>-electron effect.</td>
<td>A. Abragam, J. Horowitz and M. H. L. Pryce, F.R.S. (With an appendix by K. W. Morton)</td>
<td>169</td>
</tr>
<tr>
<td>The axisymmetric boundary layer on a long thin cylinder.</td>
<td>M. B. Glauert and M. J. Lighthill, F.R.S.</td>
<td>188</td>
</tr>
<tr>
<td>Experimental characteristics of the proton synchrotron.</td>
<td>P. B. Moon, F.R.S., L. Riddiford and J. L. Symonds</td>
<td>204</td>
</tr>
<tr>
<td>Nuclear interactions of 600 MeV protons.</td>
<td>W. O. Lock and P. V. March</td>
<td>222</td>
</tr>
<tr>
<td>Experiments on the flow of water from a reservoir through an open horizontal channel. I. The production of a uniform stream.</td>
<td>A. M. Binnie, P. O. A. L. Davies and J. C. Orkney</td>
<td>225</td>
</tr>
<tr>
<td>Experiments on the flow of water from a reservoir through an open horizontal channel. II. The formation of hydraulic jumps.</td>
<td>A. M. Binnie and J. C. Orkney</td>
<td>237</td>
</tr>
<tr>
<td>A macroscopic theory of interference and diffraction of light from finite sources. II. Fields with a spectral range of arbitrary width.</td>
<td>E. Wolf</td>
<td>246</td>
</tr>
<tr>
<td>On the relativistic equation for scattering.</td>
<td>N. Kemmer and Abdus Salam</td>
<td>266</td>
</tr>
<tr>
<td>On the Feynman principle.</td>
<td>J. C. Polkinghorne</td>
<td>272</td>
</tr>
<tr>
<td>Meson theory and nuclear matter.</td>
<td>T. H. R. Skyrme</td>
<td>277</td>
</tr>
</tbody>
</table>
Contents

No. 1182. 21 June 1955

Pressure crack-figures on diamond faces. I. The octahedral face. By V. R. Howes and S. Tolansky, F.R.S. (Plates 6 and 7) ....................................287

Pressure-crack figures on diamond faces. II. The dodecahedral and cubic faces. By V. R. Howes and S. Tolansky, F.R.S. (Plates 8 to 10) . . . . 294

Hydrogenation through metal septa. By V. C. Ewing and A. R. Ubbelohde, F.R.S. 301

Configuration interaction in orbital theories. By R. K. Nesbet ..........................312

The significance of reactions of low activation energies to the mechanism of combustion. By F. J. Weinberg ..........................................................331

The angular distribution of multiply-scattered γ-radiation. By B. W. Soole 343


A neutron-diffraction study of the ferroelectric transition of potassium dihydrogen phosphate. By G. E. Bacon and R. S. Pease 359

The eigenvalues of the charge operator. By E. Karlson .................................382

The cell theory of liquids. By J. A. Barker 390

Trapped atoms and radicals in rigid solvents. By I. Norman and G. Porter. (Plates 11 and 12) .................................................................399

The molecular orbital theory of chemical valency. XIX. The charge density function. By P. P. Manning ..................................................415

The molecular orbital theory of chemical valency. XX. The energy in higher approximations. By P. P. Manning .............................................424

No. 1183. 7 July 1955

A thermocouple method of following the non-stationary state of chemical reactions. II. The evaluation of velocity coefficients and energies of activation for the propagation and termination reactions for the initial and later stages of the polymerization of vinyl acetate. By W. I. Bengough and H. W. Melville, F.R.S. .................................429

The spatial distribution and the nature of radio stars. By M. Ryle, F.R.S. and P. A. G. Scheuer .................................................................448

Meteor radiation, ionization and atomic luminous efficiency. By E. J. Opik 463

Free convection in an open thermosyphon, with special reference to turbulent flow. By B. W. Martin .........................................................502

Surface interaction between elastically loaded bodies under tangential forces. By K. L. Johnson. (Plate 13) ..............................................531

The measurement of lattice specific heats at low temperatures using a heat switch. By F. J. Webb and J. Wilks .......................................................549

An investigation of storm waves in the North Atlantic Ocean. By J. Darbyshire 560

Index ........................................................................................................570
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A thermocouple method of following the non-stationary state of chemical reactions. II. The evaluation of velocity coefficients and energies of activation for the propagation and termination reactions for the initial and later stages of the polymerization of vinyl acetate. By W. I. BENGOUGH and H. W. MELVILLE, F.R.S.</td>
<td>429</td>
</tr>
<tr>
<td>The spatial distribution and the nature of radio stars. By M. RYLE, F.R.S. and P. A. G. SCHEUER</td>
<td>448</td>
</tr>
<tr>
<td>Meteor radiation, ionization and atomic luminous efficiency. By E. J. ÖPIK</td>
<td>463</td>
</tr>
<tr>
<td>Free convection in an open thermosyphon, with special reference to turbulent flow. By B. W. MARTIN</td>
<td>502</td>
</tr>
<tr>
<td>Surface interaction between elastically loaded bodies under tangential forces. By K. L. JOHNSON. (Plate 13)</td>
<td>531</td>
</tr>
<tr>
<td>The measurement of lattice specific heats at low temperatures using a heat switch. By F. J. WEBB and J. WILKS</td>
<td>549</td>
</tr>
<tr>
<td>An investigation of storm waves in the North Atlantic Ocean. By J. DARBYSHIRE</td>
<td>560</td>
</tr>
<tr>
<td>Index</td>
<td>570</td>
</tr>
</tbody>
</table>