



## CONTENTS

	PAGE
Foreword . . . . .	<i>J. D. Cockcroft</i> v
Introduction . . . . .	<i>M. L. Smith</i> vii
List of Delegates . . . . .	xii
Opening Remarks . . . . .	<i>D. W. Fry</i> xv

### SESSION I: ION SOURCES

*Chairman:* Dr P. C. Thonemann

1 High-temperature Ion Sources . . . . .	<i>C. E. Normand, L. O. Love, W. A. Bell and W. K. Prater</i> 1
2 The Ion Source of the Amsterdam Isotope Separator . . . . .	<i>J. Kistemaker, P. K. Rol, J. Schutten and C. de Vries</i> 10
3 The Development of Ion Sources for Radioactive Materials . . . . .	<i>O. Almén and K. O. Nielsen</i> 23
4 A New Ion Source for Low Vapour Pressure Elements . . . . .	<i>J. Druaux and R. Bernas</i> 30
5 Some Experimental Ion Sources . . . . .	<i>R. H. Dawton</i> 37

### SESSION II: COLLECTOR PROBLEMS

*Chairman:* Dr J. Koch

6 Isotope Collector Developments . . . . .	<i>C. E. Normand, L. O. Love and W. A. Bell, Jr</i> 45
7 Collection Problems in the Large Electromagnetic Separator . . . . .	<i>M. L. Smith</i> 53
8 The Electromagnetic Separation of Mercury Isotopes . . . . .	<i>G. Ranc</i> 62

### SESSION III: CHEMICAL ASPECTS AND TARGET PREPARATION

*Chairman:* Mr Boyd Weaver

9 The Range of Atomic Particles with Energies about 50 keV . . . . .	<i>K. O. Nielsen</i> 68
10 Preparation of Charge Materials for Electromagnetic Isotope Separation . . . . .	<i>Boyd Weaver</i> 82

## Contents

---

	PAGE
11 Chemical Refinement of Electromagnetically Separated Isotopes . . . . .	<i>Boyd Weaver</i> 91
12 Preparation of Isotopic Targets from Electromagnetically Enriched Material . . . . .	<i>M. L. Smith</i> 97

### SESSION IV: UTILIZATION

*Chairman:* Dr C. P. Keim

13 Distribution and Utilization of Electromagnetically Enriched Isotopes from 1946 to 1955 . . . . .	<i>C. P. Keim and P. S. Baker</i> 110
14 Studies of Nuclear Properties using Separated Stable Isotopes . . . . .	<i>W. D. Allen</i> 120
15 The Use of Separated Isotopic Targets in the Study of ( $p, \gamma$ ) Reactions . . . . .	<i>J. C. Klyuyver and P. M. Endt</i> 131
16 Application of Electromagnetically Enriched Isotopes in Spectroscopic Studies and in Solid State Physics . . . . .	<i>H. G. Kuhn</i> 136
17 Remarks on the Use of Enriched Isotopic Targets with the University of British Columbia van de Graaff Accelerator . . . . .	<i>J. B. Warren</i> 141

### SESSION V: ISOTOPIC ABUNDANCE ANALYSIS

*Chairman:* Prof. J. Mattauch

18 Mass Spectrometry at Oak Ridge National Laboratory . . . . .	<i>C. P. Keim and C. R. Baldock</i> 145
19 Isotopic Abundance Measurements by Mass Spectrometry . . . . .	<i>G. H. Palmer</i> 156
20 Quantitative Analysis in Age Determination using Isotope Dilution . . . . .	<i>R. T. Jamieson and G. D. L. Schreiner</i> 169
21 A Survey of the Use of Stable Isotopes in Dilution Analyses . . . . .	<i>H. Hintenberger</i> 177
22 Some Alternatives to Mass Spectroscopy for Isotopic Abundance Determination . . . . .	<i>A. H. Gillieson</i> 190

## Contents

---

	PAGE
SESSION VI: DESIGN OF ELECTROMAGNETIC SEPARATORS	
Chairman: Prof. Dr J. Kistemaker	
23 The ORNL Isotope Separators . . . . .	<i>C. E. Normand</i> 197
24 A High Resolution Electromagnetic Separator for Active Materials . . . . .	<i>R. H. Dawton</i> 208
25 On a Type of Medium Size Electromagnetic Isotope Separator for Nuclear Research Laboratories . . . . .	<i>J. Koch</i> 214
26 A Very General Expression for the Dispersion of a Magnetic or Electrostatic Deflecting Field Sector . . . . .	<i>H. Bruck</i> 231
27 Use of Alternating Gradient Magnet Sector for High Dispersion . . . . .	<i>H. Bruck</i> 238
28 A New High Frequency Mass Spectrometer . . . . .	<i>O. Osberghaus</i> 248

## SESSION VII: SEPARATION OF ACTIVE MATERIAL

Chairman: Dr R. Bernas

29 Nuclear Studies with Electromagnetically Separated Radioisotopes . . . . .	<i>G. Andersson</i> 256
30 Some Results on the Electromagnetic Separation of Radioactive Isotopes . . . . .	<i>R. Bernas</i> 262
Subject Index . . . . .	269