

THE  
JOURNAL  
OF  
SYMBOLIC LOGIC

EDITED BY

ALONZO CHURCH  
ALICE A. LAZEROWITZ

HARTLEY ROGERS, JR

ARTHUR N. PRIOR  
JULIA ROBINSON

*Managing Editor:* ALFONS BORGER

*Consulting Editors:*

ALAN ROSS ANDERSON  
C. A. BAYLIS  
JONATHAN F. BENNETT  
PAUL BERNAYS  
MARTIN DAVIS  
FREDERIC B. FITCH  
G. HASENJAEGER  
LEON HENKIN

HANS HERMES  
E. J. LEMMON  
RICHARD MONTAGUE  
ANDRZEJ MOSTOWSKI  
GERT H. MÜLLER  
STEVEN OREY  
RÓZSA PÉTER

ABRAHAM ROBINSON  
GENE F. ROSE  
BARKLEY ROSSER  
H. ARNOLD SCHMIDT  
KURT SCHÜTTE  
DANA SCOTT  
J. F. THOMSON  
A. R. TURQUETTE

VOLUME 28

1963

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC.  
WITH SUPPORT FROM UNESCO THROUGH ICSU AND FROM INSTITUTIONAL  
MEMBERS

---

*Copyright 1964 by the Association for Symbolic Logic, Inc.  
Reproduction by photostat, photo-print, microfilm, or like process by permission only.*

THE  
JOURNAL  
OF  
SYMBOLIC LOGIC

EDITED BY

ALONZO CHURCH    HARTLEY ROGERS, JR    ARTHUR N. PRIOR  
ALICE A. LAZEROWITZ    JULIA ROBINSON

*Managing Editor:* ALFONS BORGERS

*Consulting Editors:*

ALAN ROSS ANDERSON	HANS HERMES	ABRAHAM ROBINSON
C. A. BAYLIS	E. J. LEMMON	GENE F. ROSE
JONATHAN F. BENNETT	RICHARD MONTAGUE	BARKLEY ROSSER
PAUL BERNAYS	ANDRZEJ MOSTOWSKI	H. ARNOLD SCHMIDT
MARTIN DAVIS	GERT H. MÜLLER	KURT SCHÜTTE
FREDERIC B. FITCH	STEVEN OREY	DANA SCOTT
G. HASENJAEGER	RÓZSA PÉTER	J. F. THOMSON
LEON HENKIN		A. R. TURQUETTE

VOLUME 28

1963

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC  
WITH SUPPORT FROM UNESCO THROUGH ICSU AND FROM INSTITUTIONAL  
MEMBERS

---

*Copyright 1964 by the Association for Symbolic Logic, Inc.  
Reproduction by photostat, photo-print, microfilm, or like process by permission only*

THE  
JOURNAL  
OF  
SYMBOLIC LOGIC

EDITED BY

ALONZO CHURCH    HARTLEY ROGERS, JR    ARTHUR N. PRIOR  
ALICE A. LAZEROWITZ    JULIA ROBINSON

*Managing Editor:* ALFONS BORGERS

*Consulting Editors:*

ALAN ROSS ANDERSON	HANS HERMES	ABRAHAM ROBINSON
C. A. BAYLIS	E. J. LEMMON	GENE F. ROSE
JONATHAN F. BENNETT	RICHARD MONTAGUE	BARKLEY ROSSER
PAUL BERNAYS	ANDRZEJ MOSTOWSKI	H. ARNOLD SCHMIDT
MARTIN DAVIS	GERT H. MÜLLER	KURT SCHÜTTE
FREDERIC B. FITCH	STEVEN OREY	DANA SCOTT
G. HASENJAEGER	RÓZSA PÉTER	J. F. THOMSON
LEON HENKIN		A. R. TURQUETTE

VOLUME 28

1963

PUBLISHED QUARTERLY BY THE ASSOCIATION FOR SYMBOLIC LOGIC, INC  
WITH SUPPORT FROM UNESCO THROUGH ICSU AND FROM INSTITUTIONAL  
MEMBERS

**The four numbers of Volume 28 were issued at the following dates:**

**Number 1, pages 1–112, January 22, 1964.**

**Number 2, pages 113–176, March 4, 1964.**

**Number 3, pages 177–272, May 1964,**

**Number 4, pages 273–346, July 1964,**

**All numbers of this volume are copyrighted by the Association for Symbolic Logic, Inc. Reproduction of copyrighted numbers of the Journal by photostat, photo-reprint, microfilm, or like process is forbidden, except by written permission of the Managing Editor.**

**Reprinted 1983**



## TABLE OF CONTENTS

Recursive real numbers. By A. H. LACHLAN . . . . .	1
Functions which remain partial recursive under all similarity transformations. By NORMAN SHAPIRO . . . . .	17
A method of modelling the formalism of set theory in axiomatic set theory. By A. H. KRUSE . . . . .	20
A note on many-one reducibility. By SHIH-CHAO LIU . . . . .	35
A weak completeness theorem for infinite valued first-order logic. By L. P. BELLUCE and C. C. CHANG . . . . .	43
What is strict implication? By IAN HACKING . . . . .	51
Some remarks concerning theories with recursively enumerable completions. By ALAN COBHAM . . . . .	72
Remark on a system of Bernays. By JOHN MYHILL . . . . .	75
Axiomatization of the infinite-valued predicate calculus. By LOUISE SCHMIR HAY . . . . .	77
The system CA of combinatory logic. By FREDERIC B. FITCH. . . . .	87
Reviews . . . . .	98
Policy announcement . . . . .	111
The Aristotelian Society prize for an essay in the philosophy of mathematics . . . . .	111
Notice of fellowship and research opportunities in mathematics. . .	112
Relative necessity. By TIMOTHEY SMILEY . . . . .	113
A logical analysis of some value concepts. By FREDERIC B. FITCH. .	135
On many-one degrees. By SHIH-CHAO LIU . . . . .	143
An addendum. By S. C. KLEENE . . . . .	154
Descriptive completeness and inductive methods. By KEITH LEHRER	157
On $n$ -adic representation of numbers. By THOMAS E. PATTON . . . .	161
Reviews . . . . .	164
Tensor products of polyadic algebras. By AUBERT DAIGNEAULT . .	177
An extension of the Craig-Lyndon interpolation theorem. By LEON HENKIN . . . . .	201
Independent axioms for infinite-valued logic. By ATWELL R. TURQUETTE . . . . .	217

TABLE OF CONTENTS

Separation principles in the hierarchy theory of pure first-order logic.  
 By M. R. KROM . . . . . 222

On the solvability of a subclass of the Surányi reduction class. By  
 RICHARD GOLDBERG. . . . . 237

Reviews . . . . . 245

Meeting of the Association for Symbolic Logic . . . . . 262

Notice of the 1964 international congress for logic, methodology and  
 philosophy of science . . . . . 270

Elections . . . . . 272

Notice of a meeting of the Association for Symbolic Logic . . . . 272

A theorem on hyperhypersimple sets. By DONALD A. MARTIN . . . . 273

Addendum to early history of the Association for Symbolic Logic. By  
 C. J. DUCASSE and HASKELL B. CURRY . . . . . 279

Persistence and Herbrand expansions. By JOSEPH S. WHOLEY . . . . 280

Reviews . . . . . 283

Twenty-eighth annual meeting of the Association for Symbolic Logic.  
 By CAROL R. KARP . . . . . 297

Abstracts of papers . . . . . 297

List of officers and members of the Association for Symbolic Logic . 309

Index of reviews . . . . . 333

## ERRATA

### VOLUME 2

Page 93, line 21. For *CCpqCCqrCCpr*, read *CCpqCCqrCpr*.

### VOLUME 15

Page 236, line 10 from the bottom. For (XIII 221), read (XIII 212).

Page 285, line 11. Delete the parenthesis after XIV.

### VOLUME 21

Page 409, line 14. For «ZASPAVSKIJ», read «ZASLAVSKIJ».

### VOLUME 24

Page 274, line 1. Add 35 at the end of the line.

Page 347, column 1. The reference «Reprinted (XXIV 191)» should be deleted in lines 28–29 and inserted instead at the end of line 30.

### VOLUME 25

Page 287, line 24. For XXI 370, read XXI 367.

Page 378, line 18. For XXII 72, read XVIII 340.

### VOLUME 27

Page 83, line 27. For «RószA», read «RózsA».

Page 92, line 32. For «un dihr», read «und ihr».

Page 93, line 2 from the bottom, and page 94, lines 1 and 5. For «Łos», read «Łoś».

Page 98, line 21. For  $\alpha$ , read  $|\alpha|$ .

Page 100, line 18. For «*Mathématique*», read «*Mathématique*».

Page 100, line 22. Read «*Boolean*».

Page 101, line 18. For «ANTONIŃ», read «ANTONÍN».

Page 108, line 25. For «*domains*», read «*domain*».

Page 109, line 12 from the bottom. For  $\mathfrak{F}(e_r\mathfrak{F}(r))$ , read  $\mathfrak{F}(e_r\mathfrak{F}(r))$ .

Page 120, line 17 from the bottom and page 121, line 4 from the bottom. For «*Minneapolis*», read «(Minneapolis)».

Page 225, line 20. For «case», read «*case*».

Page 226, line 25. For «*language*», read «*langage*».

Page 251, line 9. For XXIII 99, read XXIII 99(14).

Page 357, line 1. For «Frayne s», read «Frayne's».

Page 359, line 24. For  $\alpha^2(\bar{\alpha}^1(x))$ , read  $\alpha^{(2)}(\bar{\alpha}^1(x))$ .

Page 369, line 13 from the bottom. For «*siti*», read «*siti*».

Page 370, line 20. For «D. VON DANTZIG», read «D. VAN DANTZIG».

Page 370, line 24. For «*Elementarmathematik*», read «*Elementar-Mathematik*».

Page 371, line 17 from the bottom. After «*confirmation*», insert «(XXVII 122)».

## ERRATA

Page 472, line 21. For «thcorem», read «theorem».

Page 472, line 34. For «equivalences», read «equivalence».

## VOLUME 28

Page 100, line 6 from the bottom. For «finite», read «infinite».

Page 162. The next to last asciom of group (4) should read:

$$Ax, l, y \rightarrow Ax\Delta x, l, yl.$$