

THE
JOURNAL
OF
SYMBOLIC LOGIC

EDITED BY

ALONZO CHURCH
ALICE A. LAZEROWITZ

HARTLEY ROGERS, JR

ARTHUR N. PRIOR
JULIA ROBINSON

Managing Editor: ALFONS BORGERS

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 complements. 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 $C\Delta$ 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 ARWELL 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 «*Rózsa*», 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 α , read $|\alpha|$.

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

Page 100, line 22. Read «*Boolean*».

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

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

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

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 «*cases*».

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 $\alpha^2(\tilde{\alpha}^1(x))$, read $\alpha^{(2)}(\tilde{\alpha}^1(x))$.

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 **«equivalence»**, read **«equivalence»**.

VOLUME 28

Page 100, line 6 from the bottom. For **«finites»**, read **«infinites»**.

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

$$\mathbf{Ax}, 1, y \rightarrow \mathbf{Ax}\Delta_k, 1, y1.$$