A history of British logic

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The medievals

Anselm of Canterbury 1033–1109

John of Salisbury c. 1115–1180

Robert Kilwardby 1210–1279

Walter Burley c. 1275–1344

William Ockham c. 1280–1349

The Oxford Calculators (Bradwardine, Kilvington, Swineshead), 14th century

John Major c. 1465–1550

George Lokert c. 1485–1547

Anselm of Canterbury

You exist so undoubtedly, my Lord God, that it is inconceivable that you don't exist. And deservedly, for if it were conceivable that you don't exist, then some mind could think of something greater than you, and that creature would rise above the creator and could pass judgment on the creator, which is absurd.

(Paraphrased from *Proslogion*)

The reductio ad absurdum has the form A, not the form B;
the distinction seems to have gone unnoticed until Łukasiewicz in 1926:

A

$$\frac{p \to \bot}{\neg p}$$

B

$$\frac{\begin{array}{c}[\,p\,]\\ \vdots \\ \bot\end{array}}{\neg p}$$

Robert Kilwardby

In 1277, being Archbishop of Canterbury, he condemned as heretical thirty errors, of which ten were in logic.
The condemned errors included the view that

'ego currit, tu currit et curro eque sunt perfecte et congrue'

('I runs', 'you runs' and 'I run' are equally correct and coherent)

William Ockham

Philotheus Boehner discovers the following tautologies (among others) in Ockham:

$$p \; \to \; (q \to p)$$

$$\neg p \; \to \; (p \to q)$$

$$(p \to q) \; \leftrightarrow \; \neg(p \wedge \neg q)$$

$$\neg(p \to q) \; \to \; (q \to p)$$

$$((p \to q) \wedge \neg q) \; \to \; \neg p$$

$$(p \to q) \; \to \; ((r \to p) \to (r \to q))$$

$$\neg(p \vee q) \; \leftrightarrow \; (\neg p \wedge \neg q)$$

$$p \to (p \vee q)$$

$$((p \vee q) \wedge \neg p) \; \to \; q$$

John Major

'An inference is *formally good* if it is impossible to give an inference of similar form which is bad.'

'Similar form' means similarity in the following respects:

- Placing of negation.

- Nature of quantifiers.

- Tense of verb.

- Equality of terms.

John Argall died 1606

'Introductio ad Artem Dialecticam'
('Introduction to the Art of Logic'),
London 1605

'was a great actor in plays at Christ Church (particularly when the queen was entertained there, 1566)'

'For here lies the point: if I drown myself wittingly, it argues an act: and an act hath three branches; it is, to act, to do, to perform: **argal**, she drown'd herself wittingly.'
Hamlet Act V scene i

## The hymn-writers

John Milton 1608–1674

Let us, with a gladsome mind,
Praise the Lord, for he is kind:
For his mercies ay endure,
Ever faithful, ever sure.

Let us therefore warble forth
His mighty majesty and worth:
For his mercies ay endure,
Ever faithful, ever sure.

JOANNIS MILTONI
Angli,
Artis Logicæ
Plenior Inftitutio,
AD
PETRI RAMI
Methodum concinnata,

Adjecta eft Praxis Annalytica & *Petri Rami* vita. Libris duobus,

LONDINI,
Impenfis *Spencer Hickman*, So-
cietatis Regalis Typographi, ad
infigne *Rofæ* in *Cæmeterio*,
D.Pauli. 1672.
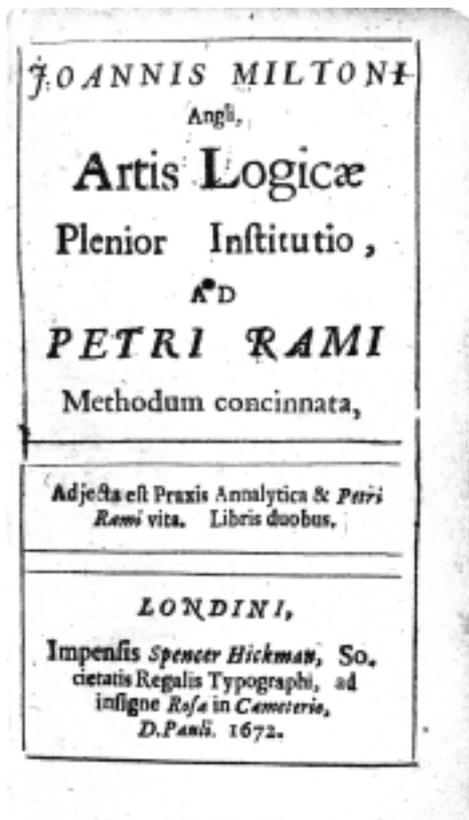
Henry Aldrich 1647–1710

Plate 1. Henry Aldrich, opening of *Out of the deep*, autograph score, Oxford, Christ Church, Mus. 19, p. 199

'Artis Logicae Compendium', London 1691

Isaac Watts 1674–1748

'Tis the voice of the sluggard; I heard him complain,
"You have wak'd me too soon, I must slumber again."
As the door on its hinges, so he on his bed,
Turns his sides and his shoulders and his heavy head.

(From *Divine Songs for Children*)

LOGIC;
or,
THE RIGHT USE OF REASON,
IN THE
ENQUIRY AFTER TRUTH:
WITH
A VARIETY OF RULES TO GUARD AGAINST ERROR, IN THE AFFAIRS
OF RELIGION AND HUMAN LIFE, AS WELL AS IN
THE SCIENCES.
BY
ISAAC WATTS, D. D.
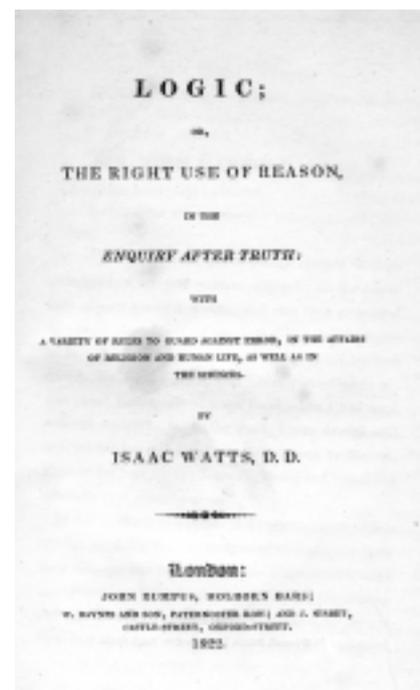
London:
JOHN RUMPUS, HOLBORN BARS;
W. BAYNES AND SON, PATERNOSTER ROW; AND J. MAWMAN,
CASTLE-STREET, OXFORD-STREET.
1822.

Archbishop Richard Whately 1787–1863

Guard us waking, guard us sleeping;
And, when we die,
May we in thy mighty keeping
All peaceful lie:
When the last dread call shall wake us,
Do not thou our God forsake us,
But to reign in glory take us
With thee on high.

ELEMENTS
of
LOGIC.

COMPRISING

THE SUBSTANCE OF THE ARTICLE

IN THE

ENCYCLOPÆDIA METROPOLITANA:

WITH

ADDITIONS, &c.

By RICHARD WHATELY, D.D.
PRINCIPAL OF ST. ALBAN'S HALL, AND LATE FELLOW
OF ORIEL COLLEGE, OXFORD.

LONDON:
PRINTED FOR J. MAWMAN,
LUDGATE-STREET.

1826.
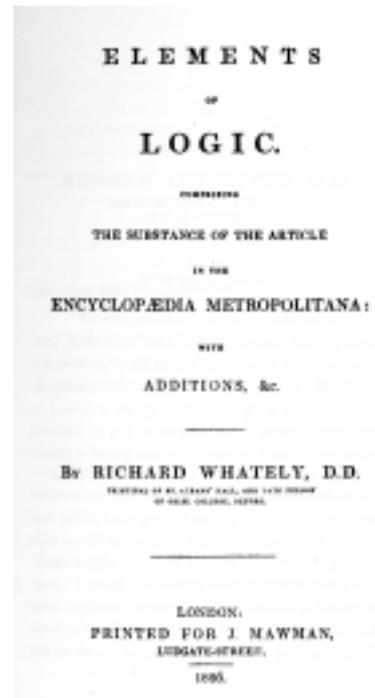
George Herbert's view of logic

Parents first season us; then schoolmasters
Deliver us to laws; they send us bound
To rules of reason, holy messengers,
Pulpits and Sundays, sorrow dogging sin,
Afflictions sorted, anguish of all sizes,
Fine nets and stratagems to catch us in, ...

(From *Sin*)

The mathematicians

George Peacock 1791–1858

The wrong William Hamilton 1788–1856
'His strange hatred of the mathematical
sciences was owing to an unusual
inaptitude for them' (De Morgan)

Augustus De Morgan 1806–1871

George Boole 1815–1864

John Venn 1834–1923

Stanley Jevons 1835–1882

Hugh McColl 1837–1909

Terminology first introduced in this period

Peacock:
Interpretation (of a formal system).

Wrong Hamilton:
Quantifier.

De Morgan:
Universe.
Mathematical logic.
Transitive relation (?).

John Stuart Mill:
Formal logic (in the sense of logic based on forms of sentences, not Kant's sense).

The linguists and cognitive scientists

Victoria Lady Welby 1837–1912
'who for twenty years eloquently exhorted philosophers and others to concentrate attention on the meaning of meaning, particularly in her articles on 'Sense, Meaning and Interpretation' . . . '

Henry Sweet 1845–1912
'Words, logic and grammar', *Transactions of the Philological Society* (1875–6)

F. H. Bradley 1846–1924

Bernard Bosanquet 1848–1923

H. W. B. Joseph 1867–1943

H. H. Joachim 1868–1938

C. K. Ogden 1889–1957 and I. A. Richards 1893–1979, *The meaning of meaning* (1936)

The philosophical analysts

Bertrand Russell 1872–1970

Susan Stebbing 1885–1943

Ludwig Wittgenstein 1889–1951

Frank Ramsey 1903–1930

Peter Strawson 1919–

Peter Geach 1919–

Michael Dummett 1925–

John Lemmon 1930–1966

More mathematicians

Max Newman 1897–1984

Bernhard Neumann 1909–

Alan Turing 1912–1954

R. L. Goodstein 1912–??

Alan Rose

Graham Higman 1917–

Abraham Robinson 1918–1974

Robin Gandy 1919–1995

John Shepherdson

Fred Rowbottom

Mike Yates

John Crossley

Alan Rose
At Nottingham University, specialised in many-valued logics

From an ANC web page on Mac Maharaj:

'Over the past 40 years he has been an activist, a detainee, a political prisoner, an exile, an underground commander, a negotiator and a cabinet minister in South Africa's first democratic government. . . .

He is married to **Zarina, who has an MSc (Mathematics and Computer Science) from Nottingham University** and an MA in Gender and Development from the University of Sussex. She has been a lecturer and a researcher and currently writes a weekly column for a business newspaper on gender issues.'

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Three distinguished visitors

M. H. Löb
(Leeds)

Arthur Prior 1914–1969
(Manchester 1959–1965, Oxford 1965–1969)

Hao Wang 1921–1995
(Oxford)

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Mervyn Pragnell

This man appeared from nowhere and persuaded several fledgling computer scientists, among them Rod Burstall, Peter Landin and Christopher Strachey, to take an interest in lambda calculus. Then he disappeared. Later he tried to do the same with work of Barwise, but never quite succeeded. Nobody seems to know what he does for a living. His signature was in several logic-related books in a secondhand bookshop in London earlier this year, so it is possible he has retired. Any information welcome please!

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Mathematical logic

- Model theory

- Proof theory

- Recursion theory and inductive definition

- Set theory

- Sheaves and logic

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Logic in computer science and systems engineering

- Formal specification and verification

- Fuzzy logic

- Game semantics

- Logic of communication

- Logic programming

- Modal and temporal logic

Logic in education and cognitive science

- Activities for teaching logical concepts

- Individual styles in logical reasoning

- Logical structure of informal reasoning

- Use of mental resources in logical reasoning

Logic in linguistics

- Semantics of anaphora and dialogue

- Unification grammars and other grammars

History of logic

The British Logic Colloquium

1954? First Logic Weekend in Oxford, organised by Lemmon.

1961 Last Logic Weekend in Manchester.

1962 ASL-funded meeting in Leeds.

1963 Crossley and Dummett organise meeting in Oxford, NATO funds, first with proceedings published as book.

1964 Meeting in Bristol.

1965 Meeting in Leicester, proceedings published.

1967 Summer School in Logic, Leeds; proceedings published.

1969 Meeting in Manchester, named "Logic Colloquium '69".

1970 Conference in Mathematical Logic, London '70, proceedings published. (No ASL funding.) This year Gandy, Shepherdson and Drake circulated a proposal for a British Logic Colloquium.

1971 Cambridge Summer School in Mathematical Logic (last BLC meeting with NATO funding—rival NATO-free meeting in Uldum). BLC set up this year.

1975? BLC becomes a charity for tax purposes, taking over the fund held by Gandy and Shepherdson for receipts from publication of proceedings.

1976 "Logic Colloquium '76" in Oxford.

1977 "Logic Colloquium '77" in Wrocław clinches the name for the European ASL summer meetings.