

The **AERONAUTICAL** Journal



Contents

J. M. Swihart

Cost effective transportation and high technology

B. Nageswara Rao, B. P. Shastry and G. Venkateswara Rao

Large deflections of a cantilever beam subjected to a tip concentrated rotational load

A. Mukherjee and M. Mukhopadhyay

Finite element free vibration analysis of stiffened plates

A. R. G. Mundell and D. G. Mabey

Pressure fluctuations caused by transonic shock/boundary-layer interaction

Library reviews, additions and reports

Incorporating

The Aeronautical Quarterly

Volume 90 Number 897 August/September 1986

The AERONAUTICAL Journal

Volume 90 Number 897 August/September 1986

Incorporating the Aeronautical Quarterly



Head of Publications:
Robert Bryanton

Editor: Jay Wolff,
Assoc. Member RAeS

Deputy Editor: Michèle Didyk

Associate Editor:
Professor L. F. Crabtree,
PhD, CEng, FRAeS

4 Hamilton Place, London W1V 0BQ
Tel: 01-499 3515
Telex: 262826 RAESOC
Cables: Didaskalos,
London W1

Advertisements:
Kevin Shead,
T. G. Scott & Son,
30-32 Southampton Street,
London WC2E 7HR.
Tel: 01-240 2032
Telex: 299181.

(Telecopier facilities available)

Reproduction of any of the papers
published in this journal is not
permitted without the written con-
sent of the Editor.

None of the papers or paragraphs
must be taken as expressing the
opinion of the Council unless
otherwise stated.

Printed by
Manor Park Press Ltd.
Unit 7, Highfield Industrial Estate,
Edison Road, Hampden Park,
Eastbourne.

Subscriptions: £116 per annum,
post free.

RAeS members: £10.50 per
annum.

Single copies, including back
numbers: £12.

All foreign currency rates on
application.

Published by
The Royal Aeronautical Society,
4 Hamilton Place,
London W1V 0BQ, England.

ISSN: 0001-9240

**PUBLISHED MONTHLY
EXCEPT JUNE AND
AUGUST**

Contents

249

J. M. Swihart

Cost effective transportation and
high technology

262

**B. Nageswara Rao, B. P. Shastry and
G. Venkateswara Rao**

Large deflections of a cantilever
beam subjected to a tip concentrated
rotational load

267

A. Mukherjee and M. Mukhopadhyay

Finite element free vibration analysis
of stiffened plates

274

A. R. G. Mundell and D. G. Mabey

Pressure fluctuations caused by
transonic shock/boundary-layer
interaction

283

**Library reviews, additions and
reports**

**Incorporating the Journals of The
Institution of Aeronautical Engineers and
The Helicopter Association of Great
Britain**

The Royal Aeronautical Society

FOUNDED 1866

INCORPORATED BY ROYAL CHARTER 1949

Patron: HER MAJESTY THE QUEEN

COUNCIL

President: Dr. J. W. FOZARD, OBE, DSc, DCAE, BSc(Hons), FEng, FIMechE, FAIAA, FRAeS

President-Elect: PROFESSOR J. L. STOLLERY, DSc(Eng), DIC, CEng, FCGI, AFAIAA, FRAeS

Vice-Presidents:

Dr. P. H. CALDER, OBE, PhD, BSc(Hons), DIC, ACGI, CEng, MIMechE, FRAeS
N. A. JACKSON, CBE, CEng, FRAeS

Past Presidents:

PROFESSOR M. G. FARLEY, HonCGIA, CEng, FIMechE, FBIM, FIProdE, FRAeS
Dr. G. K. C. PARDOE, PhD, BSc(Eng), DLC, CEng, FBIS, FRAeS
T. H. KERR, CB, BSc, CEng, FRAeS

Members:

M. W. ANDERSON, AE, MA(Cantab), CEng, MICE, MSAE, AFAIAA, FRAeS
A. E. M. BARTON, DFC, CEng, MRAeS
A. L. BLACKMAN, OBE, MA, FRAeS
V. W. CLARKSON, CEng, FRAeS (*Chairman — Branches Committee*)
AIR MARSHAL SIR ERIC DUNN, KBE, CB, BEM, CEng, FRAeS, RAF
N. FALCONER, BSc, MEcon, FISTat, MRAeS
Dr J. E. GREEN, MA, PhD, CEng, FRAeS
P. A. HEARNE, MSc, DLC, FEng, FRAeS
G. C. HOWELL, MA, MSc, CEng, FRAeS
R. HUBBARD, BSc(Eng), Student RAeS
D. J. KNIGHT, BSc(Eng), MRAeS
B. P. LAIGHT, OBE, MSc, FEng, FIMechE, FRAeS
H. METCALFE, OBE, BSc, ARCS, FEng, FRAeS
Dr. G. G. POPE, CB, MSc(Eng), PhD, DIC, CEng, FCGI, FRAeS
AIR MARSHAL SIR CHARLES PRINGLE, KBE, MA, FEng, CBIM, FRAeS, RAF(Ret'd)
D. J. RICHER, MSc, CEng, MRAeS
V. A. B. ROGERS, MSc, FEng, FIMechE, FRAeS
P. R. SAMPSON, TEng, AMRAeS
J. T. STAMPER, MA(Cantab), FEng, HonFRAeS
D. STINTON, MBE, CEng, MIMechE, FRAeS
A. T. WORKER, Student RAeS

Overseas Division:

D. R. REES, CEng, FRAeS (*President — Australia*)
WG. CDR. G. MURRAY, CEng, MRAeS (*President — New Zealand*)
B. H. PRESCOTT, CEng, MRAeS (*President — South Africa*)
CAPT. J. R. HEAP, CEng, FRAeS (*President — Zimbabwe*)

Officers:

Hon. Treasurer: PROFESSOR M. G. FARLEY, HonCGIA, CEng, FIMechE, FBIM, FIProdE, FRAeS
Secretary: G. C. MAY, CEng, MIProdE.