

TRANSACTIONS  
OF THE  
ROYAL AERONAUTICAL SOCIETY.

*Edited by W. Barnard Faraday, LL.B.*

**No. 1.**

The Calculation of Stresses in Aeroplane  
Wing Spars

BY

ARTHUR BERRY, M.A.,

Fellow of King's College, Cambridge.

*PRICE FIVE SHILLINGS.*

London :

**The Royal Aeronautical Society,**

7, Albemarle Street, W.

1919.

# Calculation of Stresses in Aeroplane Wing Spars.

BY

ARTHUR BERRY, Fellow of King's College, Cambridge.

---

## CONTENTS.

	PAGE
1. Introduction ... ..	3
2. Assumptions and Notation ... ..	3
3. Generalised Equation of Three Moments ... ..	4
4. Calculation of Bending Moments at the Joints, Compressions and Tensions ... ..	6
5. Calculation of the Maximum Bending Moments and of the Corre- sponding Fibre Stresses ... ..	8
6. Calculation of the Deflections ... ..	9
7. Illustrative Numerical Example ... ..	10
8. Mathematical Appendix ... ..	17
9. The Effect of Offset Wires ... ..	21
10. Numerical Example ... ..	21
Table I. The Functions $f(\theta)$ , $\phi(\theta)$ , $\psi(\theta)$ ... ..	25
Table II. The Functions $F(\theta)$ , $\Phi(\theta)$ , $\Psi(\theta)$ ... ..	28
Table III. The Function $\text{Tanh } \theta$ ... ..	30
Note I. The Case when the Joints are not Collinear ... ..	31
Note II. The Case when the End Load Approximates to Euler's Col- lapsing Load ... ..	32

---

The Royal Aeronautical Society.

7, ALBEMARLE STREET,

LONDON, W.1.

1919.