

**THE PHYSICAL CONSTITUTION OF  
THE SUN, A DISCOURSE DELIVERED  
IN THE SHELDONIAN THEATRE AT  
OXFORD, BEFORE THE BRITISH  
ASSOCIATION, JUNE 29, 1860**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649356034

The physical constitution of the sun, a discourse delivered in the sheldonian theatre at oxford, before the british association, june 29, 1860 by Robert Walker

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Cover @ 2017

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**ROBERT WALKER**

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A DISCOURSE

DELIVERED IN  
THE SHELDONIAN THEATRE AT OXFORD,  
BEFORE THE BRITISH ASSOCIATION,  
JUNE 29, 1860:

WITH  
AN APPENDIX ON THE PHENOMENA OBSERVED IN SPAIN  
DURING THE ECLIPSE OF JULY 18.

BY  
REV. ROBERT WALKER, M.A., F.R.S.,  
READER IN EXPERIMENTAL PHILOSOPHY, OXFORD; AND GENERAL SECRETARY  
OF THE BRITISH ASSOCIATION.



LONDON:  
TAYLOR AND FRANCIS,  
RED LION COURT, FLEET STREET.  
1860.

184. G. 12.

TO THE LORD WROTTESELEY,  
M.A., V.P.R.S., F.R.A.S.,  
PRESIDENT OF THE BRITISH ASSOCIATION FOR THE  
ADVANCEMENT OF SCIENCE.

MY DEAR LORD,

I received your permission to dedicate this little volume to your Lordship with very great pleasure. I am glad to have so favourable an opportunity of testifying my great respect to you, as President of the British Association; of expressing, as far as I may be competent to do so, my full appreciation of your scientific labours; of offering, on my own part and that of others, sincere thanks for your exertions in promoting the interests of science; and, further, of acknowledging the kindness and courtesy which I, in common with every one who has been brought into communication with your Lordship, have uniformly met with.

I have the honour to be,

My dear Lord,

Yours very faithfully,

ROBERT WALKER.





## PREFACE.

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A VERY few words are necessary, by way of introduction, to the accompanying discourse. It is printed in the form in which it was delivered, and very nearly verbatim from the original manuscript. A few alterations have been made, chiefly as corrections of expressions, and with the object of rendering the meaning more intelligible. The commencement of the part on the Magnetism of the Sun has been rewritten; and some slight additions have been made, in order to render that most interesting and important question a little clearer. The curves in Plate IV., from the Kew Observations, have been introduced from the paper read by General Sabine before the Royal Society in March last, and which has only very recently been published. That paper cannot be too strongly recommended to the careful reading of every one who is anxious for accurate information on that subject.

Sincere acknowledgments are due to General Sabine for the amount of information supplied by his papers, and for the advantage of being

allowed to read his preface to the *St. Helena Observations* before it was published; and also to Mr. Warren De la Rue for the readiness with which he supplied most valuable particulars respecting his observations in Spain during the late solar eclipse. Extracts from his communication will be read in the Appendix.

ROBERT WALKER.

OXFORD, Aug. 3, 1860.

## THE SUN.

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THE object of this discourse is to bring forward, as far as I may be able, the present state of our knowledge concerning the physical condition of the great central body of this our system. It is evident, therefore, that I shall borrow information from every source within my reach, and I shall effect my purpose if I succeed in gathering together that which is known in a clear and connected form.

There was a time when it would have seemed presumptuous to speculate on the condition of a body holding such a position in the universe of God. But we have learned that it is a fitting exercise of the reason with which we have been endowed, to endeavour to apprehend the conditions which have been impressed upon every part of the creation. We may thus rise up in some degree from the real and eternal laws which have been prescribed, to the fuller and clearer contemplation of Him who prescribed them. It is true that His works, even in their marvellous