Explanation of the Plate.

The two tufa deposits A, B, will probably prove to be a single bed. In the section thin bedded sandstones crop out at A. A coarse grained grit overlies the limestone at C. The limestone C is at most twenty feet in thickness. The coarse grit above the limestone contains abundant casts of corals allied to *Cyathophyllum*.

NEW ORBIT of the DOUBLE STAR $\beta 416 =$ SCORPII 185.

By Prof. S. Glasenapp, Imperial Observatory, St. Petersburg.

(Communicated by H. C. Russell, B.A., C.M.G., F.R.S.)

[*Read before the Royal Society of N. S. Wales, June 6, 1894.*]

Since I published in the No. 115 of the journal "Astronomy and Astrophysics" the elements of the true orbit of β 416, I have received from Mr. H. C. Russell, Government Astronomer for New South Wales, a set of measures of this star made by Mr. R. P. Sellors during the year 1893. With the kind permission of Mr. H. C. Russell, I here reprint these observations :—

Observations of β 416 made by Mr. R. P. Sellors.

Epoch.	θ	Weight.	ρ	Weight.	
1893·493	349°·9	10	0″·65	10	Star East of Meridian
·528	348·6	6	0·82	6	,, ,,
·531	347·7	7	0·73	7	,, ,,
·597	347·7	6	0·57	4	Star West of Meridian
·608	347·5	5	0·77	5	,, ,,

Mean : 1893·55 $\theta = 348°·3$ $\rho = 0″·71$ 5 nights.

These measures are of great value for the investigation of the orbit ; and make it possible to obtain a new set of elements. If we take into consideration these observations we obtain the following elements :—

$T = 1892{\cdot}15$	$\iota = 59{\cdot}77$
$u = 27{\cdot}66$ years	$\epsilon = 0{\cdot}442$
$n = 13°0177$	$\Psi = 26°228$
$\Omega = 153°30$	$a = 2''{\cdot}04$
$\lambda = 255{\cdot}80$	

The comparison of these elements with the observations is given in the following table :—

t	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
	°	°	°	″	″	″
1876·52	240±	235·4	+4·6	1·80	1·47	+0·33
77·58	223·5	223·9	−0·4	1·78	1·54	+0·24
88·72	147·5	148·5	−1·0	1·89	1·69	+0·20
89·55	133·0	140·1	−7·1	1·16	1·41	−0·25
90·60	122·0	121·3	+0·7	0·81	0·96	−0·15
91·53	82·3	80·1	+2·2	0·51	0·61	−0·10
92·38	24·4	24·0	+0·4	0·58	0·69	−0·11
93·55	348·5	347·8	+0·7	0·71	1·17	−0·46

The differences $\theta_o - \theta_c$ are very small, but the differences $\rho_o - \rho_c$ are considerable, and present a systematical rate ; the three first residuals are positive, the others are negative.

To verify the results obtained I have determined the corrections of the elements of Mr. T. E. Gore (Monthly Notices, 1892), and have obtained :—

Elements of T. E. Gore.	Their Corrections.	New Elements.
$T = 1891{\cdot}85$	−0·05	1891·80
$u = 34{\cdot}48$ years	−2·25	32·23 years
$n = -10°{\cdot}4413$	−0°·7276	−11°·1689
$\Omega = 139°{\cdot}43$	+9°·09	148°·52
$\lambda = 278°{\cdot}25$	−5°·43	272°·82
$\iota = 56°{\cdot}72$	+4°·12	60°·84
$\epsilon = 0{\cdot}5562$	−0·0645	0·4917
$\Psi = 33°{\cdot}7934$	−3°·8485	29·9449
$a = 2''{\cdot}13$	+0″·06	2″·19

The obtained corrections approach the elements of Mr. T. E. Gore to those which I have determined ; we may consider this circumstance as an indication that our elements are near the truth. The

comparison of the corrected T. E. Gore's elements with the observations is given in the following table :—

t	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
	°	°	°	″	″	″
1876·52	240±	236·8	+3·2	1·8±	1·59	+0·21
77·58	223·5	227·3	−3·8	1·78	1·60	+0·18
88·72	147·5	148·7	−1·2	1·89	1·63	+0·26
89·55	133·0	140·4	−7·4	1·16	1·39	−0·23
90·60	122·0	122·8	−0·8	1·81	0·96	−0·15
91·53	82·3	82·3	−1·5	0·51	0·59	−0·08
92·32	24·4	23·8	+0·6	0·58	0·64	−0·06
93·55	348·5	346·9	+1·6	0·71	1·15	−0·44

It is to be seen that the systematical rate in the distances is not eliminated.

I have also compared the elements which are determined by Mr. S. W. Burnham in the No. 119 of the "Astronomy and Astrophysics," by the graphical way, namely :—

T = 1892·26	ι = 44°·0
u = 24·7 years	ϵ = 0·56
n = —14°·57	Ψ = 34°·056
Ω = 122°.0	a = 1″·46
λ = 273°·5*	

This comparison is given in the following table :—

t	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
	°	°	°	″	″	″
1876·52	240·±	240·2	−0·2	1·8±	1·63	+0·17
77·58	223·5	232·9	−9·4	1·78	1·64	+0·14
88·72	147·5	146·0	+1·5	1 89	1·27	+0·62
89·55	133·0	135·6	−2·6	1·16	1·14	+0·02
90·60	122·0	117·4	+4·6	0·81	0·91	−0·10
91·53	82·3	87·4	−5·1	0·51	0·62	−0·11
92·38	24·4	26·5	−2·1	0·58	0·47	+0·11
93·55	348·5	321·3	+27·2	0·71	0·78	−0·07

Although the elements of Mr. S. W. Burnham present a very good agreement (except 0″·62 for 1888) between the calculated and observed distances, and the residuals $\rho_o - \rho_c$ have not a

* S. W. Burnham gives $\lambda = 93°·5$; we have added 180°.

systematical rate, yet the calculated angle of position for the last observation differs so much from the observed that we cannot admit such an error, and must suppose that his elements are not the most probable ones.

New observations made during the current year will make it possible to decide the question with certainty.

On the VALUE of GRAVITY at the SYDNEY OBSERVATORY.

By E. F. J. Love, M.A., Fellow of Queen's College,

Demonstrator and Assistant Lecturer in Natural Philosophy in the University of Melbourne.

(Communicated by H. C. Russell, B.A., C.M.G., F.R.S.)

[*Read before the Royal Society of N. S. Wales, June 6, 1892.*]

Some years ago the Royal Society of Victoria—acting on a suggestion made by the present writer—appointed a Committee* to superintend the carrying out of a gravity Survey of Australasia. This committee obtained from the Royal Society of London the loan of three pendulums which had already been swung in many parts of the world, notably in the operations of the Great Trigonometrical Survey of India; a number of observations have been taken with these pendulums† in order to determine the relative values of the acceleration due to gravity at Melbourne and Sydney, and to compare them with the observations made with the same pendulums at Kew and Greenwich.

* Proc. Roy. Soc. Vic. (New Series), Vol. II., p. 163; and the Reports of the Gravity Survey Committee in subsequent volumes.

† See Barracchi, Proc. Roy. Soc. Vic. (New Series) Vol. VI., p. 162; and Love, Proc. Roy. Soc. Vic. (New Series), Vol. VII., p. 1.

Glasenapp, Sergei. 1894. "New orbit of the double star β416 = Scorpii 185." *Journal and proceedings of the Royal Society of New South Wales* 28, 59–62. https://doi.org/10.5962/p.359182.

View This Item Online: https://www.biodiversitylibrary.org/item/130363
DOI: https://doi.org/10.5962/p.359182
Permalink: https://www.biodiversitylibrary.org/partpdf/359182

Holding Institution
Smithsonian Libraries and Archives

Sponsored by
Biodiversity Heritage Library

Copyright & Reuse
Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at https://www.biodiversitylibrary.org.

This file was generated 21 September 2023 at 21:22 UTC