TABLE 2.

number of estimates	mean phase	mean estimated brightness	number of estimates	mean phase	mean estimated brightness
10 10 10 10 10 10 10 10 10 10 10 10	P '004 '021 '040 '060 '082 '096 '116 '140 '163 '188 '203 '224 '238 '251 '263 '276 '288	s 1'4 1'9 2'4 2'3 2'4 2'6 2'2 1'3 1'6 2'4 1'1 1'8 2'2 1'9 2'7	10 10 10 10 10 10 10 10 10 10 10 10	P546 557 569 588 595 605 637 666 686 709 732 759 773 786 800 818	s 15.6 14.0 11.8 8.6 8.5 6.5 4.5 3.0 2.0 2.1 2.0 2.8 2.1 2.6 2.8 2.0 2.3
10 10 10 10 10 10 10 10	308 326 346 363 382 412 436 457 483 503 514	2.0 2.5 .8 2.0 3.0 1.9 2.1 3.3 7.0 9.7	10 10 10 10 10 10 10 10	.833 .847 .865 .874 .886 .902 .918 .938 .961 .973 .983	2'0 2'5 1'0 2'0 2'1 2'3 2'4 1'8 1'9 1'6 2'0 2'6

TABLE 3.

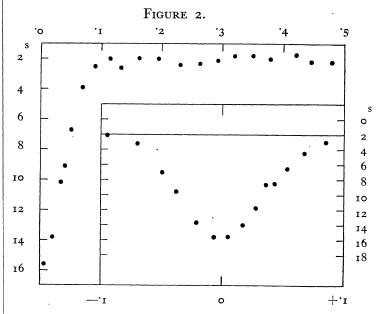
n	phase counted from minimum	mean estimated brightness	n	phase counted from minimum	mean estimated brightness	
	P	s	}	P	s	
20	.006	15.6	40	195	2.0	
20	.010	13.8	40	'231	2.4	
20	.032	10.5	40	.263	2.3	
20	.040	6.1	40	292	2.1	
20	.021	6.7	40	.319	1.8	
20	.068	3.9	40	·349	1.8	
20	.090	2.2	40	.378	2.0	
20	115	2.0	40	'419	1.7	
20	137	2.6	38	'446	2.2	
20	163	2.0	40	479	2.2	

The condensed results of the estimates are given in Tables 2 and 3 and are partly graphically represented in Figure 2.

A least squares solution gave the phase of the minimum to be $^{P}\cdot5515$. The corresponding mean epoch is J.D. 2424573 $^{d}\cdot574$ (E = 451) with a mean error of about \pm $^{d}\cdot002$. The star varies approximately from 14 $^{m}\cdot7$ to 15 $^{m}\cdot3$.

The mean error of the mean of 10 estimates outside the minimum is \pm *35 or 18·1 for one estimate. Inside the minimum the latter mean error is \pm 18·6.

There is no evidence of a secondary minimum. A comparison between even and odd minima did not



bring out any systematic difference between them. The duration of the minimum is d·33 or P·2.

The total range appears to be about m·6, so that for this reason a doubling of the period is not excluded. If the period is 3d·35 and the two components are identical, the corresponding density is about ·15 times that of the sun.

I am grateful to Prof. HERTZSPRUNG, who made it possible for me to work at the Leiden Observatory for a few weeks.

New observations of the variable ω Centauri No. 1, by W. Chr. Martin.

The brightest variable in ω Centauri was classified by Bailey as a δ Cephei variable, possibly somewhat irregular, of 29^d·34 period (cf. *H.A.* 38).

Measurements on plates taken with the 26" Yale telescope at Johannesburg in 1931 and 1935 revealed that the light curve of this star showed the peculiarities of the RVTau type variables. In maximum the variable

is about 10^m.7. In 1931 the variable showed two alternating minima of respectively 12^m.6 and 11^m.7. In 1935 the minima were about equally deep viz. 12^m.1 (cf. B.A.N. No. 312).

To follow up the further behaviour of this variable the writer has taken new plates of ω Centauri with the new Leiden twin astrograph erected in 1938 on

the grounds of the Union Observatory, Johannesburg. The astrograph consists of two triplets of 40 cm

TABLE.

J.D 2420000	1 ABLE.								
9340-439		m	n	phase		m	n	phase	
9340-439				_				_	
597380 11127 23 137 34291 1213 12 443 61368 11142 16 171 35:276 1212 12 430 62:398 11141 16 188 36:325 11:88 8 448 63:315 11:50 16 204 37:240 11:68 12 463 65:475 11:64 8 241 38:307 11:28 12 482 71:528 12:16 12 344 41:225 10:81 12 531 75:449 12:19 8 411 42:207 10:84 12 538 80:375 11:12 8 495 43:253 10:98 12 566 81:458 10:90 12 513 44:215 11:08 12 582 82:289 10:99 8 527 46:262 11:25 12 617 85:293 11:02 8 578 48:255 11:24 12 651 88:305 11:16 8 597 50:184 11:33 12 684 87:344 11:16 16 613 51:188 11:40 6 701 88:305 11:11 8 646 62:200 12:26 12 889 89:274 11:19 8 646 62:200 12:26 12 889 89:275 11:24 8 663 65:187 11:95 12 935 94:361 11:43 12 733 67:189 11:39 12 935 94:361 11:48 8 752 70:189 11:39 12 935 94:361 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:275 11:48 8 752 70:189 10:88 12 095 92:28 11:49 8 649 60:189 10:88 12 005 99:297 11:75 8 877 90:343 11:68 12 785 74:368 11:23 12 095 90:242 11:60 12 782 73:299 11:15 12 095 90:243 11:68 12 785 74:368 11:23 12 096 90:297 11:75 8 817 76:245 11:29 12 12 095 90:243 11:68 12 785 74:368 11:23 12 096 09:297 11:75 8 817 76:245 11:29 12 128 095 90:343 11:84 16 818 77:212 11:18 12 144 90:33 12 00:36 11:79 12 09:37 90:343 11:84 16 818 77:212 11:18 12 144 90:33 12 00:36 11:79 12 09:37 90:343 11:84 16 818 77:212 11:18 12 12 160 03:35 11:86 12 03:75 11:30 12 01:25 12 03:11 12:30 10:35 11:186 12 09:37 90:242 11:29 12 03:6 82:366 11:50 12 03:11 12:20 12 03:6 82:366 11:50 12 03:11 12:20 12 03:6 82:366 11:50 12 03:11 12:20 12 03:6 82:366 11:50 12 03:11 12:20 12 03:6 82:366 11:50 12 03:11 12:20 12 03:11 12:20 12 03:11 12:20 12 03:11 12:20 12 03:11 12:20 12:20 12:23 12 03:11 12:20 12:20 12:23 12 03:11 12:20 12:20 12:23 12 03:20 12:22 12:23 12 03:20 12:23 12:23 12 03:20 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:23 12:24 12:23 12:24 12:25 12:25 12:25 12:25 12:25 12:25 12:25 12:25 12:			Q	. P	d d				
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62:398									
63 315		-							
65;475 11'64 8 241 38'397 11'28 12 449 71'528 12'16 12 344 41'225 10'81 12 531 75'449 12'19 8 411 42'297 10'84 12 548 58'375 11'12 8 495 43'253 10'98 12 566 58'458 10'90 12 513 44'215 11'08 12 582 82'289 10'99 8 527 46'262 11'25 12 617 618 5397 50'184 11'33 12 684 63'395 11'16 8 597 50'184 11'33 12 684 63'395 11'16 6 630 53'360 11'39 5 738 88'305 11'11 16 66 630 53'360 11'39 5 738 89'274 11'19 8 646 62'200 12'26 12 889 90'275 11'26 8 663 64'326 12'06 12 905 90'275 11'26 8 663 64'326 12'06 12 905 90'275 11'26 8 663 64'326 12'06 12 939 92'305 11'32 8 698 66'206 11'59 12 939 93'305 11'34 12 733 67'189 11'39 12 974 95'226 11'49 8 748 69'189 10'84 12 008 95'501 11'48 8 7752 70'189 10'83 12 0042 97'249 11'60 12 782 73'299 11'15 12 008 97'249 11'60 12 785 78'368 11'33 12 0042 97'249 11'60 12 785 78'368 11'33 12 0049 99'297 11'75 8 817 70'245 11'84 12 127 109 11'37 12 110 11'33 11'84 16 818 77'212 11'8 12 128 99'343 11'84 16 818 77'212 11'8 12 128 99'343 11'84 16 818 77'212 11'8 12 128 10'305 11'68 12 937 88'320 11'37 12 100 06'315 11'86 12 937 88'320 11'39 12 297 09'364 11'36 11 989 88'320 11'39 12 297 09'364 11'36 11 989 88'210 12'18 12 310 10'326 11'07 12 095 48'200 11'97 12 451 10'298 11'39 12 10'326 11'07 12 095 09'243 11'79 12 091 09'243 11'79 12 091 09'243 11'79 12 091 09'243 11'79 12 091 09'243 11'79 12 091 09'243 11'79 12 091 09'243 11'79 12 095 09'262 12'25 12 30'79 11'35 12 11'42 12 11'79 12 13'57 11'37 12 11'99 12 13'57 11'37 12	62.375		2						
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81'458	80.375							566	
82 289 10 99 8 527 46 262 11 25 12 617 85 293 11 10 2 8 578 48 255 11 21 12 651 86 395 11 10 6 630 53 360 11 33 12 684 80 274 11 19 8 646 62 200 12 26 12 889 89 412 11 29 8 649 63 190 12 20 12 905 90 275 11 26 8 663 65 187 11 95 12 905 90 2405 11 30 8 683 65 187 11 95 12 939 92 305 11 32 8 698 66 206 11 59 12 939 94 361 11 43 12 733 67 189 11 39 12 957 94 361 11 43 8 748 69 189 10 88 12 957 96 189 10 88 12 967 96 189 10 88 12 <t< td=""><td>81.458</td><td></td><td>12</td><td></td><td></td><td></td><td>12</td><td></td></t<>	81.458		12				12		
85.293 11.02 8 .578 48.255 11.24 12 .651 86.395 11.16 8 .597 50.184 11.33 12 .684 87.344 11.16 16 613 51.188 11.40 6 .791 88.305 11.21 16 630 53.360 11.39 5 .738 89.241 11.29 8 .649 63.190 12.20 12 .905 90.275 11.26 8 .663 .64;326 12.06 12 .905 91.408 11.30 8 .668 .65:187 11.95 12 .939 94.361 11.43 12 .733 .67:189 11.39 12 .957 95.226 11.49 8 .748 .69:189 10.88 12 .925 96.444 11.58 12 .768 .71:194 10:93 12 .942 97.423 11.60 12	82.289	10,00	8			11'25	12	·617	
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90°275 11°26 8 '663 64°326 12°06 12 '925 91°408 11°30 8 '683 65°187 11°95 12 '939 93°305 11°32 8 '698 66°206 11°59 12 '957 95°206 11°49 8 '748 69°189 10°84 12 '008 95°501 11°48 8 '752 70°189 10°88 12 '025 96°444 11°58 12 '768 71°194 10°93 12 '074 97°429 11°60 12 '782 73°299 11°15 12 '078 97°423 11°68 12 '785 74°368 11°23 12 '096 98°288 11°64 8 '800 75°190 11°27 12 11°0 99°297 11°75 8 817 '76°245 11°29 12 '128 99°343 11°84 16 '818 '77°12 11°18 12 '144 940°1334 11°88 12 '852 78°272 11°30 12 '162 02°282 11°90 12 '936 82°306 11°50 12 '231 06°315 11°86 12 '937 84°238 11°47 12 '197 06°304 11°79 12 '936 82°306 11°50 12 '231 06°315 11°68 12 '937 85°248 11°82 12°24 09°364 11°36 11 '989 88°210 12°18 12 '247 09°364 11°36 11 '989 88°210 12°18 12°18 12°32 10°326 11°07 12 '005 90°262 12°25 12 '367 10°355 11°11 16 '005 92°212 12°23 12 '400 11°333 11°35 12 '039 94°200 11°97 12 '434 11°38 11°20 12 '091 99°243 10°76 12 '417 12°302 10°35 12°18 12°32 11°32 12°14 10°82 12°54 10°96 12 '486 15°35 11°35 12 '144 01°34 11°42 12 '074 95°204 11°76 12 '451 15°257 11°27 12 '089 99°243 10°76 12 '550 15°35 11°47 12 '091 99°243 10°76 12 '550 15°35 11°47 12 '193 09°208 11°42 12 '064 11°24 12 '064 11°24 12 '064 11°35 11°47 12 '193 09°208 11°42 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 12 '689 11°42 11°82 11°44 12 '689 11°42 11°42 11°44 12 '689 11°42 11°42		_						-	
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95°226	92 305								
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97'249				.768				-	
97'423									
98 288				.785					
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9401'334 11'88 12 '852 78'272 11'30 12 '162 02'282 11'90 12 '868 79'344 11'42 12 '181 03'355 11'87 12 '886 80'332 11'47 12 '193 06'304 11'79 12 '936 82'306 11'50 12 '231 06'315 11'86 12 '954 85'248 11'82 12 '264 07'351 11'68 12 '954 85'248 11'82 12 '281 07'361 11'67 12 '954 86'203 11'98 12 '297 09'364 11'36 11 '089 88'210 12'18 12 '332 10'355 11'11 16 '005 90'262 12'23 12 '307 11'293 10'93 12 '039 94'200 11'97 12 '434 14'396 11'12 12 </td <td>99'343</td> <td></td> <td>16</td> <td>.818</td> <td>77.212</td> <td>11.18</td> <td>12</td> <td>144</td>	99'343		16	.818	77.212	11.18	12	144	
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^{*} From estimates on plates taken with the Yale telescope.

aperture and 230 cm focal length; 1 mm on the plates corresponds to 89".5. As the variable is 8'.4 distant from the centre of ω Centauri it is a suitable object for the new telescope.

From 1939 March 17 to September 22 354 exposures were taken on 113 nights. The exposure times range from two to six minutes. As a rule three exposures of respectively 3, 4 and 6 minutes were taken each night. The plates were taken mm·8 out of focus.

The variable was estimated twice on all plates with the aid of the comparison stars given in Table 1 of B.A.N. No. 312, pg. 291; magnitudes were taken from the last column of that table. The first series of estimates was done with the sequence e, b, a, c, d and g_1 , the second one with the sequence e, h, e_1 , f_1 and g_1 .

The two light curves resulting from the two estimates show the same features. However, the difference first estimate minus second one shows a small systematic change with the hour angle. From + m·oi in the meridian it varies gradually to — m·o3 at 4^h western hour angle and it is about — m·o8 at 5^h western hour angle. Large eastern hour angles did not occur.

The average of the estimates of a night are given in the table. The first column gives the heliocentric Julian Date. The second column contains the average magnitude m and the number n of the estimates used for the average.

The mean error of one average of 12 estimates is about \pm m·o35. The third column gives the phase computed with the formula: phase = $^{d^{-1}}$ ·017035 × (J.D.—2400000). The reciprocal period corresponds to the period 58^{d} ·7027, which is twice the apparent period.

The magnitudes plotted against their phases show that the minimum which was 12^m·6 in 1931 and 12^m·1 in 1935 is 12^m·2 in 1939; the minimum which was 11^m·7 in 1931 and about 12^m·1 in 1935 is 11^m·9 in May 1939 and 12^m·25 afterwards. So the minima have not yet definitely interchanged. It is interesting that in 1939 the rising branch comes about P·025 or 1^d·5 later than predicted by the period as determined from the observations of 1895 to 1935. This might be due to a rather sudden change in the period. Analogous changes in the period have been observed for other RV Tau variables according to Gerasimovič (H.C. No. 341).

ERRATUM.

In the 4th line under the figure in B.A.N. No. 312, pg. 290, read 1937 in stead of 1938.