effect of the density of sunlight on orbital motion. He found that a resisting medium, acting with a force proportional to the square of the orbital velocity, had the effect of decreasing both a and e by amounts proportional to the density of the medium and to the physical characteristics of planet or comet. Hence, if the components of *α Centauri* move in a resisting medium, the effect will be to retard the theoretical increase of a and e noted in the table above.

In considering the effect of sunlight on the motion of a planet, LAPLACE stated: "If light consist in the vibrations of an elastic fluid, the preceding analysis will give the effect of its resistance upon the motion of the planets and comets. If it be an emanation from the sun, the same analysis will also give, with some slight modification, the effect of its resistance. For we may transfer to light, and in a contrary direction, the real motion of the planet, and then consider the planet as being at rest, which will not affect their mutual action. Then the light will act upon the planet according to a direction a little inclined to its primitive path; and it will communicate to the center of gravity of the planet, according to this last direction, a force which may be reduced to two others; the one in the direction of the radius vector of the planet, the other in a direction contrary to that of the element of the path which it describes. (Bowditch Transl., Vol. IV, p. 629)

After computing the secular equations of the earth and moon caused by the resistance of sunlight to motion, LAPLACE completed the analysis by extending it to include gravitation consisting of impulses of unknown finite velocity.

"If gravitation," he concluded, "be produced by the impulse of a fluid directed towards the center of the attracting body, the preceding analysis, relative to the impulse of the solar light, will give the secular equation depending on the successive transmission of the attractive force." And finally: "We find that the velocity of the fluid producing gravitation will be about 7,000,000 times that of light; and as it is certain that the secular equation (of the moon) depends almost wholly upon the cause we have assigned in the sixth book (i. e.,to the diminution of the eccentricity of the earth's orbit), we must suppose that the gravitating fluid has a velocity which is at least 100,000,000 times that of light; or at least we must suppose, in its action on the moon, that it has at least that velocity to counteract her gravity toward the earth. Therefore, mathematicians may suppose, as they have heretofore done, that the velocity of the gravitating fluid is infinite."

It is evident that LAPLACE's investigation of gravitation by no means precludes that of SULAIMAN, which seems to me to merit more serious consideration than it has yet received.

Vassar College Observatory,
Poughkeepsie, N. Y.,
May, 1935.

TRIGONOMETRIC PARALLAXES

DERIVED FROM PLATES TAKEN WITH THE TWENTY-INCH REFRACTOR OF THE VAN VLECK OBSERVATORY

(Second List)

BY CARL L. STEARNS

These parallaxes were determined from photographs taken with the 51-cm. (20-inch) visual refractor of the Van Vleck Observatory of Wesleyan University, using a Wratten number 12 "minus blue" filter and Cramer Isochromatic plates until November, 1930. After that date Wratten and Wainwright Panchromatic plates were used.

The plates were taken by F. SLOCUM, B. W. SITTERLY, N. W. STORER, and the writer, and they were measured by the writer with the exception of those for star No. 96, which was measured by LOIS T. SLOCUM, and those for Nos. 56, 69, 77, 78, 82, 95, and 97, which were measured by N. W. STORER. The computing was done by LOIS T. SLOCUM, N. W. STORER, H. P. BLAKESLEE, H. M. FRENCH, ANTOINETTE BURR, and C. H. KNAPP.

The magnitudes in the fifth column are taken from the *Henry Draper Catalogue* when possible; otherwise from *Publications of the Cincinnati Observatory*, No. 20. Italics in this column indicate photographic magnitudes. For stars brighter than the sixth magnitude, the catalogue proper motions in the sixth and seventh columns are taken from Boss' *Preliminary General Catalogue;* for the fainter stars, from Cincinnati 20.

This list of parallaxes is a continuation of that published in *Astronomical Journal*, volume 40, page 143. Stars No. 58, 62, 67, 73, 74, 81, 84, 87, and 97 are included in the list of test objects in *Astronomical Journal*, volume 36, page 185.

Van Vleck Observatory, Wesleyan University,
Middletown, Conn.,
May 10, 1935.

No.	Name	R. A. (1900)	Decl. (1900)	Magn.	Proper Motion — Catalogue — Total	Proper Motion — Catalogue — In x	Proper Motion — Obs. In x	Relative Parallax and P. E.		No. of Plates	Comp. Stars
		h m	° ′		″	″	″	″	″		
54	Wolf 1323	2 46.0	+34 0	*10*	1.37	+0.93	+0.998	+0.064	±0.006	31	6
55	BD +1°543	3 1.2	+ 1 36	8.9	0.95	+0.34	+0.350	+ .055	8	26	4
56	NGC 1514	4 3.2	+30 31	*8.0*			—0.010	— .017	8	20	4
57	46 Tauri	4 8.2	+ 7 28	5.4	0.005	+0.004	—0.007	+ .041	6	25	5
58	Berlin B 1366	4 8.6	+22 6	8.9	0.51	+0.42	+0.395	+ .003	8	20	5
59	Cbr. M. 1885	4 27.9	+55 13	8.6	0.63	+0.57	+0.556	+ .030	8	26	4
60	*Aldebaran*	4 30.2	+16 18	1.1	0.203	+0.069	+0.068	+ .075	10	27	5
61	Ross 33	4 37.0	+18 47	9.0	1.27	+0.71	+0.650	+ .106	9	20	5
62	BD —5°1123	4 55.9	— 5 53	6.5	1.25	+0.55	+0.535	+ .104	11	20	4
63	ADS 3900	5 14.2	— 3 11	8.5	0.72	+0.70	+0.698	+ .064	6	30	4
64	Ross 409	5 26.7	+29 19	*11*	0.34	—0.30	—0.308	+ .050	9	22	6
65	Ross 47	5 36.4	+12 28	*10*	2.53	+2.02	+2.024	+ .169	8	24	6
66	Albany 1860	5 37.5	+ 2 39	8.8	0.55	+0.21	+0.257	+ .019	7	20	4
67	*Betelgeuse*	5 49.8	+ 7 23	0.9	0.029	+0.028	+0.017	+ .008	6	53	8
68	Anonymous	6 22.7	+35 59	*10.5*	0.53	+0.40	+0.351	+ .016	8	25	5
69	Ross 615	6 26.3	— 1 30	9.4	0.50	—0.31	—0.236	+ .022	7	24	6
70	*Sirius*	6 40.7	—16 35	—1.6	1.316	—0.526	—0.383	+ .379	6	64	7
71	Wolf 294	6 48.3	+33 24	*10.5*	0.87	—0.75	—0.708	+ .158	7	25	4
72	NGC 2392	7 23.3	+21 6	8.7			0.000	— .007	7	23	5
73	*Castor* B	7 28.2	+32 6	2.8	0.204	—0.172	—0.097	+ .085	6	49	5
74	*Castor* A	7 28.2	+32 6	2.0			—0.199	+ .076	6	49	5
75	*Castor* C	7 28.2	+32 5	9.6			—0.211	+ .066	6	49	5
76	*Procyon*	7 34.1	+ 5 29	0.5	1.243	—0.696	—0.622	+ .267	6	48	6
77	Cbr. M. 3088	8 11.7	+54 25	9.3	0.64	—0.02	+0.006	+ .005	10	24	4
78	Wolf 315	8 28.8	+42 6	8.0	0.66	—0.24	—0.246	+ .050	9	32	5
79	BD +36°1970	9 25.8	+36 46	9.1	0.55	—0.22	—0.207	+0.065	8	23	3
80	Comp. to *Regulus*	10 2.8	+12 29	7.6	0.247	—0.247	—0.198	+ .026	11	23	3
81	*Regulus*	10 3.0	+12 27	1.3	0.247	—0.247	—0.218	+ .017	7	23	5
82	Wolf 358	10 45.7	+ 7 21	*11*	1.23	—0.81	—0.832	+ .135	8	30	5
83	Bonn 7830	10 51.4	+42 25	9.0	0.79	—0.73	—0.680	+ .005	7	24	4
84	SU *Draconis*	11 32.2	+67 53	Var.			—0.011	— .007	10	25	4
85	ADS 9090 A	13 58.5	+46 49	9.0	0.55	+0.55	+0.601	+ .037	10	21	4
86	ADS 9090 B	13 58.5	+46 49	9.0	0.55	+0.55	+0.595	+ .060	9	21	4
87	*Arcturus*	14 11.1	+19 41	0.2	2.28	—1.102	—1.082	+ .092	10	27	4
88	Ross 130	14 24.8	+15 57	9.5	1.74	—1.00	—1.024	+ .060	8	28	4
89	Berlin A 5335	14 41.7	+16 56	9.0	0.95	—0.13	—0.087	+ .044	15	22	4
90	Wolf 562	15 14.2	— 7 21	9.2	1.32	—1.32	—1.216	+ .173	10	29	4
91	BD +35°2774	16 2.9	+34 55	9.5	0.64	+0.26	+0.245	+ .038	10	30	5
92	Ross 142	18 45.0	+ 2 59	*10*	0.46	—0.12	—0.195	+ .075	10	27	4
93	Wolf 1062	19 7.1	+ 2 44	*11.2*	1.88	+1.77	+1.777	+ .086	10	23	5
94	Bonn 12845	19 15.7	+41 28	8.8	0.66	+0.06	+0.116	+ .009	7	30	6
95	Bonn 12989	19 23.7	+49 15	8.0	0.83	+0.45	+0.456	+ .021	6	26	6
96	BD +35°3659sf	19 27.3	+35 57	9.5	0.56	—0.04	—0.023	+ .001	9	25	6
97	XZ *Cygni*	19 30.4	+56 10	9.7			+0.061	+ .014	5	34	6
98	*Altair*	19 45.9	+ 8 36	0.9	0.657	+0.536	+0.535	+ .202	8	32	4
99	Leip. II 10245	20 33.7	+ 5 18	9.0	0.90	—0.89	+0.002	+ .018	10	22	5
100	Ross 257	20 39.8	+19 24	9.5	0.57	+0.03	—0.014	+ .051	10	27	4