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ONE HUNDRED NEW DOUBLE STARS.

SEVENTEENTH LIST.

The double stars listed in this paper have all been discovered and measured with the 36-inch refractor.

It will be seen that several of the notes appended relate to the colors of the stars. It has been my experience, in the examination of some 5,000 close double-star systems with the great telescope, that the cases of striking color contrast in double stars are comparatively rare, even when the components differ decidedly in brightness. I mean by this, cases where the difference in color is sufficiently marked to impress itself upon an observer with eyes of normal color sensitiveness who is not especially intent upon noting such phenomena. Even in such a pair as A 2250, in the present list, in which the orange-red color of the primary is striking, the faint companion is merely a dull or dingy grayish white, not blue. In the vast majority of double stars the fainter component, like

the brighter one, appears to me to be white, though perhaps somewhat more bluish than the primary.

I attribute this to the fact that even stars of magnitude 13 or $13\frac{1}{2}$ are not particularly faint objects in the field of view of the 36-inch telescope under good conditions, and that, on this account, the subjective causes of color contrast in stars recently described by Professor Bell¹ are not so effective as they are in smaller instruments. If this is correct it seems to follow that the occasional cases of very marked color contrast in double stars observed with this telescope must rest upon actual differences in the spectra of the two components, though in these instances, too, the four subjective causes discussed by Professor Bell doubtless operate greatly to intensify the contrast.

R. G. AITKEN.

September 21, 1910.

			R.A. 1900	Decl. 1900	Date	Angle	Distance	Mag.	n	Notes
A 2201	A.G. Berlin A	33	0 ^h 08 ^m 34 ^s	+18° 05'	1910.61	195° 8	1'07	8.4—12.0	3	
2202	A.G. Berlin A	43	09 58	+18 34	10.61	329.8	0.54	9.8—9.8	3	
2203	A.G. Albany	143	34 19	+ 2 46	10.69	118.0	2.40	9.4—10.1	2	
2204	B.D. +16°64		36 13	+17 00	10.70	328.7	0.85	9.4—10.3	3	
2205	A.G. Berlin A	194	37 37	+20 14	10.68	333.6	0.40	9.5—9.5	2	
2206	A.G. Berlin A	205	41 21	+19 40	10.68	293.0	4.40	8.5—11.7	2	
2207	A.G. Berlin A	233	47 41	+17 34	10.67	162.6	3.84	8.7—12.5	2	
2208	A.G. Berlin A	244	49 38	+18 56	10.67	84.6	1.66	9.2—10.5	2	
2209	A.G. Berlin A	250	49 59	+18 24	10.67	330.4	1.37	9.7—9.7	2	
2210 ²	A.G. Berlin A	277	0 54 57	+17 40	10.66	210.8	5.06	7.5—13.6	2	
2211	A.G. Leipzig II	474	1 15 09	+ 9 00	10.61	339.8	2.44	8.5—12.5	2	
2212	A.G. Berlin A	380	15 27	+17 41	10.61	223.1	1.34	8.6—9.2	3	
2213	A.G. Leipzig II	523	20 42	+ 9 53	10.61	124.2	4.72	6.8—13.8	2	
2214	A.G. Berlin A	421	23 47	+19 33	10.63	187.8	0.78	9.5—9.8	2	
2215	A.G. Leipzig I	445	26 55	+11 11	10.62	356.4	1.56	8.8—11.5	2	

¹ The *Astrophysical Journal*, 31, 234, 1910.

² Noted as "orange" in the Berlin catalogue. The faint star has no marked color.

			R.A. 1900	Decl. 1900	Date	Angle	Distance	Mag.	n	Notes
A 2216	A.G. Leipzig I	604	1 ^h 56 ^m 45 ^s	+11° 42'	1910.62	143°4	1'66	8.5—9.7	2	
2217	A.G. Leipzig II	881	2 16 09	+ 9 13	10.62	78.1	2.91	9.1—12.8	2	
2218	A.G. Berlin A	703	28 54	+20 10	10.65	106.8	1.80	8.9—13.0	3	
2219	A.G. Berlin A	711	32 18	+19 37	10.65	300.9	0.25	9.3—9.3	3	
2220	A.G. Berlin A	733	37 22	+19 48	10.65	223.8	1.58	8.0—12.0	3	
2221	A.G. Berlin A	743	40 37	+19 32	10.66	13.5	0.58	9.6—9.8	2	
2222	A.G. Berlin A	747	41 46	+16 52	10.66	329.3	4.06	8.6—13.8	2	A and B C and D A and CD
					10.68	106.9	0.42	9.5—11.5	2	
					10.71	134.2	55.15	8.6—9.5	1	
2223	A.G. Berlin A	754	2 42 19	+17 12	10.66	61.1	1.91	9.5—9.5	2	
2224	A.G. Berlin A	875	3 10 37	+18 58	10.66	328.2	0.80	8.1—9.4	2	
2225	A.G. Berlin A	4852	13 07 19	+16 40	10.49	69.4	2.99	7.3—13.0	2	
2226	A.G. Albany	4983	14 27 30	+ 3 35	10.54	291.3	0.84	9.7—9.7	2	
2227	A.G. Albany	5008	14 32 25	+ 2 43	10.54	138.4	2.11	6.9—11.0	2	
2228	A.G. Berlin A	5447	15 02 52	+16 04	10.49	5.2	3.34	8.8—12.7	2	
2229	A.G. Berlin A	5518	16 26	+17 02	10.49	232.2	1.38	9.0—12.5	2	
2230 ³	A.G. Albany	5269	39 00	+ 2 50	10.51	102.6	3.58	6.1—13.2	3	
2231	A.G. Nicolajew	3987	15 40 54	+ 0 19	10.50	24.4	1.93	9.0—12.0	2	
2232	A.G. Albany	5411	16 15 14	+ 2 06	10.56	190.4	0.65	9.8—10.1	2	
2233	A.G. Albany	5450	21 47	+ 1 14	10.56	23.6	2.48	9.3—10.1	2	
2234	A.G. Albany	5482	28 00	+ 2 46	10.55	130.3	0.97	8.9—13.3	3	
2235	A.G. Albany	5602	16 55 13	+ 1 15	10.54	276.4	0.72	9.5—10.0	2	
2236	A.G. Nicolajew	4266	17 01 31	+ 0 47	10.54	18.0	0.91	8.5—9.6	2	
2237	A.G. Nicolajew	4276	03 40	+ 0 10	10.61	60.2	0.94	9.2—10.7	2	
2238	B.D. —18°4462		08 36	—18 54	10.60	192.4	0.62	10.0—10.5	2	
2239	A.G. Albany	5713	11 45	+ 3 04	10.61	287.4	2.94	8.8—13.2	2	
2240	B.D. —19°4599		13 57	—19 34	10.59	199.6	1.33	9.1—12.3	3	
2241	B.D. —19°4605		14 32	—19 14	10.60	75.3	5.02	6.5—14.0	2	
2242	A.G. Washington	6231	17 19	—18 01	10.62	290.4	2.76	9.0—11.5	2	
2243	A.G. Albany	5774	21 50	+ 2 25	10.49	300.3	1.79	9.7—9.8	2	
2244	B.D. —20°4775		22 18	—20 53	10.60	130.6	0.27	8.2—8.4	2	
2245	A.G. Albany	5783	23 17	+ 2 17	10.49	345.4	2.06	9.0—9.5	2	
2246	A.G. Albany	5784	23 31	+ 2 29	10.49	121.6	0.83	9.7—9.8	2	
2247	A.G. Albany	5803	25 52	+ 3 54	10.55	167.4	0.18	10.0—10.0	4	
2248 ⁴	A.G. Albany	5837	30 22	+ 4 00	10.51	248.5	1.71	8.4—12.7	3	
2249	A.G. Albany	5881	36 38	+ 1 12	10.52	309.5	1.05	9.0—12.8	2	Two very faint stars near.
2250 ⁵	B.D. —18°4634		39 04	—18 37	10.62	212.8	1.86	8.5—12.5	2	
2251	B.D. —18°4637		39 53	—18 30	10.62	257.9	2.23	9.6—9.6	2	
2252	B.D. —18°4650		42 47	—18 52	10.62	215.6	3.70	9.0—11.2	2	
2253	B.D. —18°4674		48 24	—18 27	10.63	111.4	0.58	8.7—12.0	2	
2254	A.G. Washington	6459	51 30	—18 03	10.61	179.3	0.25	9.5—9.5	2	
2255	B.D. —19°4772		51 30	—19 57	10.60	292.6	1.24	8.6—9.2	2	
2256	A.G. Washington	6485	55 12	—18 04	10.61	148.2	0.36	8.6—9.4	2	A and B AB and C
					10.57	129.7	7.05	8.5—13.5	1	
2257	A.G. Albany	6064	17 59 23	+ 3 37	10.50	162.5	0.21	9.6—9.8	3	
2258	B.D. —19°4842		18 01 02	—19 23	10.61	261.8	0.36	9.8—9.8	2	
2259 ⁶	B.D. —18°4794		01 19	—18 55	10.60	220.3	0.92	10.1—10.5	2	B and C A and BC
					10.57	259.6	19.34	9.0—	1	
2260	A.G. Albany	6140	07 15	+ 1 53	10.54	117.3	2.45	8.4—12.2	3	
2261	A.G. Albany	6176	12 44	+ 2 56	10.54	248.1	2.19	9.0—12.5	3	
2262	A.G. Albany	6362	40 31	+ 1 36	10.55	348.5	1.14	9.5—10.1	2	
2263	A.G. Nicolajew	4687	43 55	+ 0 12	10.55	89.8	1.35	8.8—9.1	2	
2264	B.D. —19°5274		18 57 12	—19 36	10.65	85.6	3.32	9.1—13.7	2	Also 14.0 star 10" n. of A
2265	B.D. —21°5267		19 01 26	—21 46	10.65	67.3	4.39	8.5—13.5	2	

³ The Albany A.G. Catalogue gives the bright star an annual proper motion of 0".17 in 213°.5.

⁴ A 9.0 star is in the field sp.; two fainter stars near the double.

⁵ The bright star is strong orange red in color, the faint star dingy, without marked color.

⁶ The wide pair is probably O. Stone 41 (Burnham's G.C. 8346), for there is no other pair near that answers Stone's description.

			R.A. 1900	Decl. 1900	Date	Angle	Distance	Mag.	<i>n</i>	Notes
A 2266	B.D. —20°5429		19 ^h 05 ^m 44 ^s	—20° 05′	1910.65	313°0	27.44	8.9—13.6	2	
2267	A.G. Albany	6614	12 19	+ 1 04	10.62	165.5	0.38	9.3—10.3	2	A and B
					10.56	145.6	14.00	9.0—13.5	1	AB and C
					10.56	121.0	14.97	9.0—13.5	1	AB and D
2268	A.G. Albany	6618	12 45	+ 3 07	10.62	249.6	0.66	8.9— 9.4	2	
2269	A.G. Albany	6627	14 55	+ 4 02	10.58	38.4	0.28	9.4— 9.8	3	
2270	A.G. Albany	6634	15 21	+ 3 37	10.58	56.1	4.37	8.9—13.5	3	
2271	A.G. Albany	6670	20 30	+ 3 13	10.52	269.6	1.78	8.8—14.0	2	
2272	A.G. Albany	6691	22 45	+ 3 46	10.52	193.6	3.42	8.2—14.2	2	
2273	A.G. Albany	6706	24 36	+ 1 39	10.52	134.4	2.01	9.1—11.0	2	
2274	A.G. Albany	6710	25 07	+ 2 07	10.52	250.8	3.30	8.9—11.5	2	
2275	A.G. Albany	6950	56 08	+ 1 04	10.68	63.1	0.40	9.0— 9.6	2	
2276	A.G. Nicolajew	5045	56 44	+ 0 54	10.68	59.8	3.29	8.9—13.0	2	
2277	A.G. Albany	6969	19 59 22	+ 4 08	10.68	357.3	1.85	8.7—11.2	2	
2278	A.G. Albany	6990	20 01 46	+ 1 39	10.68	222.9	0.72	9.6— 9.8	2	
2279	A.G. Albany	7059	12 20	+ 1 10	10.65	300.3	4.15	8.5—11.7	2	
2280	A.G. Nicolajew	5142	16 25	+ 0 15	10.64	37.6	0.40	8.4—10.5	2	
2281	A.G. Albany	7161	27 26	+ 4 06	10.63	63.8	1.62	9.0—12.2	3	Sp. of two stars,
2282	B.D. +4°4485		29 02	+ 4 13	10.64	167.7	0.38	9.6—10.1	2	same brightness.
2283	A.G. Nicolajew	5237	34 57	+ 0 57	10.64	347.8	1.96	8.8—12.8	2	
2284	A.G. Nicolajew	5238	35 11	+ 0 20	10.64	285.3	4.30	8.8—13.7	2	
2285	A.G. Albany	7255	40 42	+ 4 08	10.58	202.2	3.82	9.0—14.0	2	
2286	A.G. Albany	7308	20 47 04	+ 1 43	10.58	127.4	0.34	9.2— 9.4	2	A and B
					10.58	29.5	0.94	8.6—10.2	2	AB and C
2287	B.D. +0°4678		21 05 57	+ 0 37	10.56	99.5	0.23	9.8—10.0	3	
2288 ⁷	A.G. Albany	7498	19 17	+ 3 17	10.59	214.5	0.33	9.7— 9.7	3	
2289 ⁸	A.G. Albany	7502	20 26	+ 1 37	10.59	304.2	0.25	8.2— 9.2	3	A and B
					10.56	220.7	15.45	8.0—11.5	1	AB and C=0Σ 439
2290 ⁹	A.G. Albany	7534	27 44	+ 1 33	10.56	261.4	0.46	9.8— 9.8	2	
2291	B.D. +2°4383		21 29 55	+ 2 42	10.56	95.5	1.19	9.8—10.0	2	
2292	A.G. Nicolajew	5592	22 07 39	+ 0 41	10.60	187.2	0.84	8.3—10.5	2	
2293	A.G. Albany	7730	09 14	+ 3 58	10.60	202.8	1.98	9.3—12.5	2	
2294	A.G. Albany	7787	25 31	+ 1 21	10.64	205.5	2.97	9.0—13.0	2	Np. of two stars,
2295	A.G. Albany	7867	40 00	+ 2 04	10.65	77.7	1.26	9.4—11.8	2	same brightness.
2296	A.G. Albany	7928	53 35	+ 3 28	10.66	55.6	0.63	9.2—10.2	3	
2297	A.G. Albany	7941	22 55 45	+ 1 17	10.66	114.6	3.50	9.0—13.4	3	
2298 ¹⁰	A.G. Albany	8009	23 07 32	+ 2 09	10.67	120.9	0.24	8.9— 9.0	3	
2299 ¹¹	Anon		08 30	+ 1 41	10.67	53.0	0.45	10.3—10.7	3	
2300	A.G. Albany	8118	23 30 48	+ 1 54	10.66	252.6	4.86	8.5—13.0	2	

⁷ The Albany A.G. Catalogue assigns an annual proper motion of 0".14 in 186°.1 to this pair.

⁸ No change in the wide 0Σ pair in sixty-five years.

⁹ Both stars are strong orange color, an unusual phenomenon in so close a pair.

¹⁰ The Albany A.G. Catalogue assigns an annual proper motion of 0".17 in 178°.5 to this pair.

¹¹ This faint pair is a distant companion to 8th magnitude star 0Σ 491 (rejected). One night's measure gives the relative position as 118°.3 in 319°.2. There are other faint stars in the field.