

Bemerkungen.

Mnemosyne, Hermione, Nephthys. Oct. 30. Starker Wind. Das Mondlicht stört. — Freia, Helene. Oct. 2. Starker Wind. Sehr schlechte Bilder. — Elektra. Juli 1. Nebel. — Ophelia. Nov. 25. Der Planet kaum sichtbar.

Hierbei folgen die Sternpositionen, welche für meine Planetenbeobachtungen A. N. 3176 fehlten und seitdem hier von Herrn *Romberg* bestimmt wurden:

Mittlere Oerter für 1892.0.

*	Gr.	Ep.	α	δ	Autorität	*	Gr.	Ep.	α	δ	Autorität
2	8.5	93.8	$0^h 8^m 52^s 50$	$+16^\circ 2' 26'' 9$	1 Pulk. Mer.	27	9.3	93.1	$15^h 25^m 12^s 50$	$+4^\circ 56' 6'' 4$	3 P. M.
5	8.8	93.2	$0 17 39.56$	$+5 57 31.0$	2 P. M.	28	9.5	93.8	$22 0 40.75$	$-10 31 8.9$	Anschl. an
6	9.3	93.3	$0 19 38.23$	$+5 41 36.3$	2 P. M.	—	9.0	92.8	$22 3 19.59$	$-10 33 7.1$	2 P. M.
7	8.6	93.2	$0 22 43.95$	$+7 4 30.8$	2 P. M.	49	9.4	92.8	$23 43 47.96$	$-13 13 35.8$	1 P. M.
8	9.2	93.5	$0 26 38.71$	$+14 46 38.0$	3 P. M.	50	9.6	93.8	$23 44 17.30$	$-13 21 15.1$	Anschl. an
9	9.5	93.9	$0 35 37.77$	$+13 54 24.8$	1 P. M.	—	8.6	92.8	$23 45 21.49$	$-13 25 17.6$	4 P. M.
24	9.0	93.4	$15 3 41.97$	$+5 9 17.3$	2 P. M.	51	9.1	93.3	$23 47 52.64$	$+15 25 44.4$	2 P. M.
26	9.4	93.1	$15 17 46.1$	$+5 16 11.1$	3 P. M.						

In A. N. 3176 sind die Vergleichsterne Nr. 5, 6, 7 und 8, unrichtigen Werthes der Uhr correction wegen, um 1^s falsch gegeben.

Die Planetenpositionen, die von allen diesen Sternen abhängen, lauten deshalb so:

1892	M. Z. Pulk.	α app.	δ app.
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(6) Hebe.

Mai	12	$10^h 46^m 34^s$	$15^h 25^m 26^s 58$	$+4^\circ 55' 16'' 9$
	19	$11 17 15$	$15 18 58.01$	$+5 14 9.3$
	20	$11 52 52$	$15 18 2.16$	$+5 15 59.5$
Juni	7	$12 18 36$	$15 3 33.56$	$+5 9 3.2$

(96) Aegle.

Sept. 30	9 51 30	$23 47 29.86$	$+15 21 2.9$
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(97) Klotho.

Sept. 9	9 27 35	$22 0 39.80$	$-10 30 2.1$
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1892	M. Z. Pulk.	α app.	δ app.
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(137) Meliboea.

Oct. 11	$12^h 7^m 8^s$	$0^h 22^m 35^s 80$	$+7^\circ 7' 50'' 0$
19	$9 28 10$	$0 18 16.78$	$+5 52 27.0$
20	$8 48 0$	$0 17 48.57$	$+5 43 30.6$
20	$13 6 53$	$0 17 43.20$	$+5 41 52.7$

(196) Philomela.

Sept. 15	$13 2 15$	$23 44 49.60$	$-13 15 7.8$
16	$11 23 11$	$23 44 6.79$	$-13 19 4.0$

(247) Eukrate.

Sept. 30	$14 22 25$	$0 35 23.68$	$+13 51 48.0$
Oct. 7	$11 57 38$	$0 25 20.26$	$+14 45 8.0$
19	$10 6 25$	$0 8 51.02$	$+16 0 51.5$

In A. N. 3176 ist noch ein Rechnungsfehler zu corrigiren:

Bei (96) Klotho Aug. 30 steht $\Delta\delta = +2' 6'' 9$, statt $-2' 6'' 9$. Die richtige Declination ist demnach $-8^\circ 57' 57'' 4$.

Pulkowo 1894 Mai 15.

W. Seraphimoff.

The Magnesium Spectrum as an Index to the Temperature of the Stars.

By James E. Keeler.

In a paper recently published in the Sitzungsberichte of the Berlin Academy of Sciences, Professor Scheiner calls attention to the opposite behavior under varying conditions of temperature of two lines in the spectrum of magnesium, and shows that these lines, taken together, give a means of estimating the approximate temperature of the absorptive atmospheres of the stars. The line $\lambda 4482$ is not found in the flame or arc spectrum of magnesium, but is very broad and strong in the spectrum of the spark with Leyden

jar; the line $\lambda 4352$, on the other hand, is either invisible or very faint in the spark spectrum and strong in the spectrum of the electric arc. In stellar spectra similar differences in the relative intensity of these lines are found, and these differences are in harmony with the supposition that the temperature of the absorbing layer of stars of class Ia is approximately that of the spark with Leyden jar, and the temperature of stars of class IIIa is approximately that of the electric arc, the opposed characteristics

of the lines enabling us to discriminate between the effects of temperature and pressure. The method proposed by Professor Scheiner is certainly a plausible one, and it agrees well with what is known of the temperature of the stars on other grounds, but as the electric spark marks the limit of temperature which can at present be produced in the laboratory, it gives us no means of recognizing stellar temperatures which exceed that limit.

In this connection the behavior of the characteristic magnesium triplet δ , which is below the lower limit of Professor Scheiner's photographs, is of very great interest. In a recently published paper on the spectra of the Orion Nebula and the Orion Stars*), I have referred to the circumstance that this group is absent from the spectrum of Rigel, in which the magnesium line λ 4482 is conspicuous, and it becomes of importance to ascertain the conditions on which the disappearance of the δ group depends. So far as my own experience goes, and so far as I can gather from the published observations of others, the δ lines are strong in the flame, arc, and spark spectrum of magnesium. The range of temperature which we can command in laboratory experiments is therefore not sufficient to decide the question; but from the appearance of these lines in star spectra, considered in relation to the lines mentioned by Scheiner, their disappearance seems to be the result of a temperature higher than any that can be obtained artificially.

Thus, the δ lines are strong (apparently somewhat stronger than the solar lines) in Betelgeuse, Antares, and other stars of class IIIa; they are of about solar strength in Capella and Arcturus, and weak in Sirius and Vega;

they fail altogether†) in α Cygni, in which the line λ 4482 is remarkably conspicuous, and in Rigel.

The following considerations seem to apply to these facts: neither of the lines referred to by Scheiner belongs to one of the series of characteristic magnesium triplets; the δ lines, on the other hand, belong to a series which, from analogy with the spectra of the alkalies, is called by Kayser and Runge the second subordinate series of magnesium. For reasons which are set forth in their memoir, it is probable that the molecular structure indicated by lines having the characteristics of a subordinate series cannot exist at a very high temperature, and Kayser and Runge have in this way accounted for the absence from the solar spectrum of all the sodium pairs which do not belong to the principal series containing the D lines. The same reasoning applies to the magnesium spectrum, the only difference being that a higher temperature is required to cause the disappearance of the series to which the δ group belongs.

If this reasoning is correct, the aspect of the δ lines in stellar spectra gives us an extension of the method proposed by Scheiner, and it shows that the temperature of certain stars exceeds that of the most powerful electric spark. That Rigel should be one of these stars is somewhat surprising, considering the place which it probably occupies in the scale of development, but the reversal of the D_3 line in its spectrum seems to point to the same conclusion, and without further observation it cannot be said that the high temperature assigned to this star by the proposed method is a real difficulty.

Allegheny Observatory, 1894 June 15.

James E. Keeler.

*) Astronomy and Astro-Physics, June, 1894.

†) By this I mean that they fail to appear on my photographs, which nevertheless show quite faint lines. In α Cygni there are several lines in the vicinity of the δ group, but the δ lines themselves are not represented.

Beobachtungen von hellen Projectionen auf dem Mars.

Telegramm von der Sternwarte Nizza, eingegangen 30. Juli Mittags:

»Projection lumineuse dans région australe du terminateur de Mars observée par Javelle 28 Juillet 16 heures. *Perrotin.*«

Das Telegramm wurde sofort weiter befördert, auch nach Boston.

Telegramm aus Boston, eingegangen 31. Juli 7^h Morgens:

»Projection was discovered by Douglass, Lowell Observatory, Arizona, July 19, on several nights.«

Ein zweites Telegramm aus Boston vom 31. Juli Abends lautet:

»Percival Lowell announces light from large continental lakes of Mars found unpolarized, light of polar sea polarized, July twenty six at Lowell Observatory by William Pickering, hence polar sea probably water, lakes chiefly not. *Pickering.*«

Kiel 1894 Aug. 1.

A. Krueger.

Inhalt zu Nr. 3245. *J. Rahts.* Vorläufige Resultate einer neuen Bahnbestimmung des Tuttle'schen Cometen nebst einer Aufforderung zur Einsendung noch nicht veröffentlichter Beobachtungen. 65. — *M. Chandrikoff.* Beobachtungen des Cometen 1892 I. 67. — *L. J. Gruy.* Observations de la comète 1894 II (Gale). 71. — *W. Seraphimoff.* Beobachtungen von kleinen Planeten. 73. — *J. E. Keeler.* The Magnesium Spectrum as an Index to the Temperature of the Stars. 77. — Beobachtungen von hellen Projectionen auf dem Mars. 79.