Si cette ressemblance n'est pas purement accidentelle, — et cet accident serait en tout cas très étrange, — on peut conclure, que les queues des trois types consistent respectivement des molécules de l'hydrogène, du carbone et du fer.

Si les poids atomiques des ces trois substances ne sont pas proportionnels aux poids des molécules, alors on peut admettre, que l'hydrogène, le carbone et le fer se trouvent dans les queues en état de disgrégation ou même de dissociation.

Une divergence quelque peu anomale de la queue d'un type donné pourra s'expliquer par une disgrégation ou une dissociation plus ou moins grande.

La déviation un peu anormale de la queue par rapport au rayon vecteur pourrait être aussi l'effet de la même cause.

La queue anomale, enfin, peut-être regardée comme consistant des grains et des particules qui ne se sont pas divisés en molécules et dans lesquels la répulsion électrique du soleil est insensible par rapport à la masse pondérable de chaque particule.

Ajoutons encore, que pour les vitesses initiales des émissions je suis venu aux nombres suivants:

0.15 (I), 0.03 (II) et 0.01 (III).

Ces données, exprimées en mètres et rapportées à une seconde du temps donnent respectivement: 4500, 900 et 300 mètres par seconde.

On voit que ces vitesses sont de l'ordre des vitesses moléculaires des gazes (Meyer, Kinetische Theorie der Gase, pg. 45); elles sont seulement plus grandes que ces dernières et leurs accroissements avec la diminution du poids atomiques va plus rapidement. Mais c'est ce qu'il fallait attendre, car dans la tête d'une comète à l'énergie des molécules s'ajoute l'énergie électrique, qui se manifeste dans la répulsion exercée par le noyau et dans la répulsion mutuelle des molécules.

1879, 13 avril.

Th. Bredichin.

Stellar magnitudes.

A request to Astronomers.

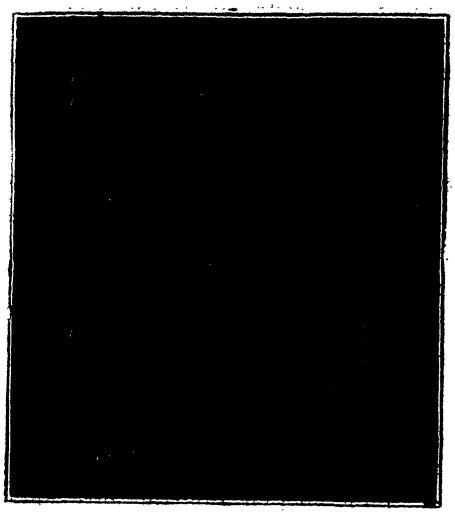
The scales adopted by different observers in their estimates of stellar magnitudes differ considerably from each other, as is well known. As regards the brighter stars, these differences, indeed, are comparatively unimportant; but they become larger and more perplexing when the objects observed are faint. Variations of three or four magnitudes may be expected between the estimates made of the brightness of minute companions seen near a brilliant star. It is needless to point out the inconvenience of this state of affair, which at times nearly deprives the estimated magnitudes, found in catalogues, of their meaning and consequently of their value.

In the hope of providing a partial remedy for this defect, a series of photometric observations of stars of various magnitudes, situated near the north pole, has been undertaken at the Harvard College Observatory. The region has been selected as one which may always be conveniently observed in the northern hemisphere, so that the brightness of a star observed in another part of the sky can readily be compared by estimate with any standard polar stars the relative brightness of which may have been determined by photometric measurements.

The table and chart given below are designed to serve as guides in finding the stars which are, as has been said, in course of photometric measurement at the Harvard College Observatory. The stars given in the table are arranged approximately in the order of their brightness, the first being α Ursae Minoris, which is taken in all cases as the standard of comparison, and the next three, δ Ursae Minoris, 51 Cephei, and λ Ursae Minoris. The chart is a copy of a sketch showing the approximate relative position of ten faint stars very near the pole, which are denoted by the Italic letters *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *k*, *l*. The places of the pole for 1855, 1880, and 1900, and of five stars from the Durchmusterung, four of which occur in the table, are also indicated upon the chart, to facilitate the identification of the faint stars. The objects called *c* and *e* are nearly in the prolongation of the line through DM. 89°37 and *b*. Between these last, and more nearly in the same line than it appears to be in the chart, lies the star *a*.

The value and interest of the photometric results to be obtained at the Harvard College Observatory may be greatly increased by the co-operation of astronomers elsewhere. All who are desirous of improving the present system of comparing the brightness of stars are therefore requested to make estimates of the magnitude of as many as may be convenient of the stars above mentioned. It is desirable that the estimate should be made, for each star which may be observed, on five

DM.	α 1880	δ 1880
88° 8	1h14m	88°40′
86.269	18.11	86.37
87. 51	6.44	87.14
88.112	19.44	88.57
88. 4	0.51	88.23
88. 9	2. 3	88.36
89. 3	2.28	89.36
89. 35	17.50	89.48
89. 37	19.28	89.54
89. 1	0.19	89.45
89. 26	13.23	89.49



different nights, and that each estimate should be, if possible, entirely independent of those previously made. It will add to the value of the work if, on every occasion when the fainter stars are looked for, a record is made of such of them as can then be seen, even if no estimate of their magnitudes is attempted.

Observers are also requested to note the approximate places of any stars not represented upon the chart, but within five minutes of the place of the pole at any time between 1880 and 1900. The boundary of this region is represented on the chart by a dotted line. The stars not shown within it have been omitted as unnecessary for the purpose of finding the others, and several of these omitted stars are inconveniently faint for photometric observation; but records of their visibility at any time and place will be valuable as evidence of the state of the atmosphere and character of the instrument employed in the observations.

All astronomers who may be induced by this request to make any observations of the kind just described will confer a favor upon the Harvard College Observatory by sending to it a copy of their records, accompanied by a statement of any modification of the proposed method of observation which they may have adopted, as well as any additional details which may appear desirable, with regard to the instruments employed etc. Unless the contrary is requested, the results will be published with the photometric measurements obtained at the Harvard College Observatory; and a copy of the publication will be sent to each observer who has cooperated in the work.

It is hoped that a large number of those astronomers whose experience has been sufficient to establish a definite scale for their estimates of stellar magnitude will consent to take part in the proposed observations, in order that the published series of observations may be complete enough to be of general utility.

Edward C. Pickering,
Director of Harvard College Observatory.

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Beobachtungen von Gill's Mars-Sternen,

angestellt in Leiden von den Herren *E. F. v. d. S. Bakhuyzen* und Dr. *J. C. Kapteyn*, mitgetheilt von Dr. *H. G. v. d. S. Bakhuyzen*.

Bezeichnung und Grösse des Sterns.	Datum.	Beobachter.	Lage des Instruments. Klemme.	AR. Mittl. Aeq. 1877.0	Declination Mittl. Aeq. 1877.0 Kreis A	Kr. B	½(Kr. A+Kr. B)
a	1877 Juli 21	B	O	22h47m	— 12°16′ 11″73	11″12	— 12°16′ 11″43
6.5	„ 30	B	O	0s.109	12 60	12.79	12.70
	Aug. 4	B	O	0.095	10.80	10.42	10.61
	„ 5	K	O	0.074	11.82	12.10	11.96
	„ 6	B	O	0.106			
	„ 15	K	O	0.067	11.59	11.42	11.51
	„ 22	B	O	0.103	12.19	12.45	12.32
	„ 30	B	W		11.88	13.15	12.52
	Sept. 2	B	W	0.076	11.59	12.48	12 04
	„ 5	K	W	0.060			
	„ 8	K	W	0.092	11.74	12 18	11.96
	„ 9	K	W	0.078	11.91	12.49	12.20
	„ 11	K	W	0.067	12.35	12.46	12.41
	„ 12	B	W	0.148	12.23	12.23	12.23
Epoche	1877.64	Mittel		22.47. 0.090	Epoche 1877.64	Mittel.	— 12.16.11.99
b	1877 Oct. 26	B	O	22.47.37.898	— 12.50.	33.79	— 12.50.33.92
6.7	Dec. 9	B	W	37.816	34.25		34.48
	„ 10	K	W	37.849	34.31		34.54
	„ 20	B	O	37.900		34.30	34.43
Epoche	1877.91	Mittel		22.47.37.858	Epoche 1877.91	Mittel.	— 12.50 34.34
z	1877 Aug. 5	K	O	22.51.39.597	— 11.47.	19.90	— 11.47.20.03
9.5	„ 6	B	O	39.663		20.47	20.60
	Nov. 16	K	W	39.691½			
	Dec. 10	K	W	39.642	20.72		20.95
Epoche	1877.73	Mittel		22.51.39.650	Epoche 1877.70	Mittel	— 11.47.20.53
c	Aug. 4	B	O	22.53. 6.985	— 13.43.	45.30	— 13.43.45.43
6	Sept. 2	B	W	6.970	46.15	47.29	46.72
	„ 5	K	W	6.936			