Plates secured with many lines of various elements will have to be compared. The mighty 30-foot spectroheliograph of the "tower telescope" of Mount Wilson is excellently adapted to work of this kind, not only on account of its great dispersion permitting the use of finer lines, but chiefly because it is provided with two camera slits, so that perfectly simultaneous photographs with different lines may be secured. By this arrangement, really comparable monochromatic pictures of the sun are obtained, since the otherwise confusing influence of the variable refraction in our atmosphere is thus rendered harmless.

I feel greatly obliged to Prof. GEORGE E. HALE for having procured for me the opportunity of making an investigation at the Mount Wilson Solar Observatory, but more still for his keen and stimulating interest in the problems, suggested by the application of the principle of anomalous refraction in astrophysics. I am also very much indebted to the kindness of Mr. F. ELLERMAN, Mr. W. S. ADAMS and Dr. CH. M. OLMSTED for valuable information and assistance in connection with the inquiry here reported upon.

Physics. — "*The* ZEEMAN-*Effect of the strong lines of the violet spark spectrum of iron in the region* λ 2380—λ 4416." By Mrs. H. B. VAN BILDERBEEK-VAN MEURS. (Communicated by Prof. P. ZEEMAN).

The concave ROWLAND grating used in the experiments here communicated has 14438 lines per inch, a width of 8 c.m., and a radius of curvature of 304.96 c.m. The grating is mounted according to RUNGE and PASCHEN's method.

The spark passed between the iron poles of the magnet in the direction of the line of force. It was originated by the discharge of the secondary coil of a RUHMKORFF, a self-induction and condenser being placed in parallel.

Further details will be given in my thesis for the doctorate.

The time of exposure varies from 30 to 120 minutes.

In order to determine the field strength I made simultaneous exposures of the iron and zinc spectra. The amount of separation of the zinc line 4680.33 was compared with the result of the measurements of COTTON and WEISS (Journal de Physique, June 1908), the strength of field being supposed proportional to the amount of separation.

λ	I	δλ vibr. ⊥ field	δλ vibr. // field	$\frac{\delta\lambda}{H\lambda^2}$ 10^{13} vibr. ⊥ field	$\frac{\delta\lambda}{H\lambda^2}$ 10^{13} vibr. // field
2382.17	10	0.214		11.80	
2395.74	4	0.206		11.23	
2562.65	5	0.238		11.34	
2585.98	10	0.292		13.66	
2598.46	8	0.310		14.36	
2599.50	20	0.334		15.46	
2607.17	10	0.315		14.50	
2611.99	10	0.335		15.36	
2617.70	6	0.361		16.48	
2625.70	4	0.324		14.70	
2628.39	8	0.229		10.37	
2631.12	4	0.299		13.51	
2631.44	3	0.289		13.06	
2727.64	6	0.379		15.94	
2739.63	15	0.327		13.63	
2743.28	8	prob. unaffected			
2746.60	10	0.222		9.206	
2747.08	8	0.306		12.69	
2749.41	20	0.272		11.26	
2753.40	5	0.245		10.11	
2755.80	15	0.278		11.45	
2767.60	5	0.418		17.07	
2967.03	3	0.320		11.37	
2994.58	3	0.439		15.31	
3001.09	2	0.397		13.79	
3002.82	3	0.388		13.45	
3008.26	2	0.413		14.28	
3020.80	3	0.412		14.13	
3037.51	3	0.433		14.68	
3047.72	3	0.440		14.82	
3057.57	3	0.345		11.54	
3059.20	3	0.446		14.91	
3227.91	5	0.354		10.63	
3440.79	4	0.434		11.47	
3466.01	3	0.759	0.389	19.77	10.13
3475.60	3	0.625	probably div.	16.19	
3490.76	4	0.574	" "	14.74	
3497.99	3	0.772		19.74	
3513.98	3	0.555		14.06	
3555.08	4	0.516		12.77	
3558.69	4	diffuse			
3565.53	5	0.349		8.589	
3570.29	10	0.420		10.31	
3581.34	10	0.460		11.22	
3585.48	3	0.446	0.387	10.85	9.418
3587.11	3	diffuse	0.489		11.89
3606.85	4	0.429		10.32	
3609.01	6	0.183		4.395	
3618.91	6	0.327		7.811	
3631.62	6	0.368		8.729	
3647.99	6	0.391		9.192	
3649.62	3	0.493		11.58	
3680.09	3	0.574	probably div.	13.26	
3687.61	4	0.626		14.40	
3705.72	4	0.565	0.262	12.87	5.969
3709.40	4	0.632		14.37	
3720.09	10	0.496		11.21	

λ	I	$d\lambda$ vibr. ⊥ field	$d\lambda$ vibr // field	$\frac{d\lambda}{H\lambda^2}$ 10^{13} vibr ⊥ field	$\frac{d\lambda}{H\lambda^2}$ 10^{13} vibr. // field
3722 71	4	0.558	0 392	12.60	8.849
3727 78	5	0 659		14 84	
3733.47	3	0 355 0.354	0.587	7 968 7.945	13 17
3735.00	10	0 592		13.28	
3737.28	7	0 459		10.28	
3745.70	5	0.474		10.57	
3748.40	4	0 276	perhaps divided	6.145	
3749.62	10	0 574		12.77	
3758.39	8	0 540		11.96	
3763.98	6	0 422		9.318	
3765.70	3	0.484		10.68	
3767.36	5	0	0	0	0
3795.14	5	0 692		15.03	
3799.70	5	0 662		14.34	
3805.48	3	0.386		8.339	
3813 12	4	0 414		8 908	
3816 00	10	0.495		10 62	
3820 [illegible]	10	0.529		11.34	
3824.57	5	0.694		14 84	
3826.08	8	0 494		10.56	
3828 00	7	0 451		9 629	
3834.41	6	0 431		9 170	
3840.61	4	0 3[illegible]3		6 426	
3850 19	4	0	0	0	0
3856 55	5	0.690		14.51	
3860.12	6	0.682		14.32	
3865.75	4	0.348 0.348	0.658	7 285 7 285	13 78
3872.70	4	0.594	0 473	12 39	9 866
3878.20	4	0 812		16 89	
3878 78	5	0.715		14.87	
3886.45	5	0.802		16.61	
3895 80	3	0.676		13.93	
3903.10	5	0.544	0.217	11.17	4 456
3920.41	4	0 634		12.90	
3923 08	4	0 694		14.11	
3928 09	4	0.705		14.29	
3930.47	4	0.715		14 48	
3969.43	5	0.758		15.05	
4005.41	6	0 787		15.35	
4045 99	15	0 618		11 81	
4063 78	10	0 544		10.31	
4071.90	8	0.351		6 623	
4181.92	4	0 700		12.52	
4199.27	5	0.577		10 24	
4202.21	6	0 617		10.93	
4236.12	4	0 982		17.12	
4250.99	6	0 5[illegible]7	0.404	9 296	6 904
4260 70	10	0.878		15.13	
4271 99	10	0.705		12 0[illegible]	
4294 32	4	0 608		10.[illegible]1	
4299 43	4	0 790		13.37	
4308 10	15	0 648		10.92	
4325 97	15	0 528		8 826	
4383 73	20	0 697		11 35	
4404.95	15	0.678		10 93	
4415 30	10	0 654		10.50	

The strengths of field used in all other exposures, could be determined by comparison of corresponding iron lines in the spectrum under review and in the standard iron-zinc spectrum.

The field strengths utilised were near 30000 Gauss. In the following table all separations are reduced to $H = 31965$ Gauss.

A calcite rhomb introduced between the spark and the focussing lens made it easy to get separate exposures of vibrations perpendicular to resp. parallel to the field. The plates used were Dr. SCHLEUSSNER's Spezial Rapid plates. They were developed with Edinol.

In the following table $d\lambda$ and λ are given in Å.U. The wavelengths and intensities are taken from EXNER and HASCHEK's tables.

In the case of triplets and quartets $d\lambda$ indicates the difference of the wavelengths of the two outer components vibrating perpendicular or parallel to the lines of force. In the case of quintets for vibrations perpendicular to the lines of force the difference of wavelengths of the components towards red and violet to the central one are given. For vibrations parallel to the lines of force the data are given as in the case of triplets.

Probably some triplets can be subdivided further, but even an approximate knowledge of the magnetic separation of the iron lines has become recently of some value by HALE's important discovery concerning the spectrum of sun-spots[1]).

I hope to give in my thesis references to the literature of the subject.

Anatomy. — *"The nervous system of a white cat, deaf from its birth: A contribution to the knowledge of the secondary systems of the auditory nerve-fibres"*. By Prof. C. WINKLER.

Through the kindness of Prof. ZWAARDEMAKER, speaker got in his possession the nervous system of a white blue-eyed cat, which during life, though most carefully observed, never reacted on acoustic stimuli, consequently deaf from its birth [2]).

This nervous system had been slightly damaged in the removing,

1) GEORGE E. HALE. Solar Vortices and the ZEEMAN-Effect.
P. ZEEMAN. Solar Magnetic Fields and Spectrum Analysis. Nature. Vol. 78, p. 368 and 369, 1908.

2) Prof. ZWAARDEMAKER writes on this subject the following:
"This white catt, born of a white mother with normal hearing (one albino-eye) "was obviously deaf from its birth. At any rate it was kept under observation "since birth, and never a single reaction on acoustic stimuli was obtained. Even