

OUR ASTRONOMICAL COLUMN.

THE SPECTRUM OF NOVA GEMINORUM NO. 2.—No. 4592 of the *Astronomische Nachrichten* contains two papers dealing with the apparent absorption lines in the spectrum of Nova Geminorum No. 2.

In the first, Herr R. Furuhielm discusses spectra taken with the one-prism spectrograph attached to the 80-cm. refractor at Potsdam Observatory, and finds coincidences between the fine dark lines in the nova spectrum, between $\lambda 3850$ and $\lambda 4650$, and the spark lines of Ti, Sc, and Sr, and possibly of Fe and Yt, having intensities of 15 or more in the lists of Exner and Haschek. He does this by first deriving a mean apparent radial velocity of -541 kms. from the shifts of all the lines, and applying this as a correction to the laboratory wave-lengths; the latter differ from the measured nova wave-lengths by about 7 \AA . In the spectrum taken on March 15 he is able to fit all the Ti, Sc, and Sr lines, numbering 10, 7, and 2 respectively, and 4 each of the 5 Fe and 5 Yt lines; 20 is the limiting intensity in the latter case. The differences between his calculated and observed wave-lengths range from $-1'21$ to $+1'36 \text{ \AA}$.

Herr Furuhielm also compares his lines with the lines for these same elements, of intensity 5 and over, in Dyson's list of chromospheric lines, and finds that there are only six lines in the chromospheric spectrum not found in that of the nova, and these lines belong to other elements.

Negatives taken on later dates did not afford so many, or so close, coincidences, and the necessary compensation for displacement varied considerably. Herr Furuhielm concludes that the apparent radial-velocities vary too much to be considered as real, two negatives taken on March 17 giving very different values.

Dr. Ludendorff, on a negative secured with spectrograph iv., at Potsdam, on March 15, finds that 37 of the dark nova lines between $\lambda 4310$ and $\lambda 4530$ coincide with lines in Rowland's table, with differences corresponding to radial velocities ranging from $+19$ to $+82$ kms.; the mean is $+49$ kms., giving a heliocentric radial velocity of $+20$ kms. He also compares his lines with the radium, uranium, and emanation lines falling in this region. The agreement for radium and the emanation is very uncertain, and for uranium negative, while the radial velocities are very different from those found by Dr. Giebel. From his results, Dr. Ludendorff does not venture to answer the question as to the presence of these radio-active elements in the nova.

OBSERVATIONS OF JUPITER.—The transit of the minor planet Lutetia across Jupiter on May 7 took place too early to be observed at the Yerkes Observatory, but Prof. Barnard made observations of the great red spot and of a transit of satellite ii. on that date, and records them in No. 4591 of the *Astronomische Nachrichten*. The spot was fairly well seen, and the bay north of it was, as usual, well defined. The southern edge of the spot was in contact with, or partly overlapped by, a heavy, irregular, and somewhat narrow, dark belt. At 18h. om. there was a long, dusky marking on the following limb of the planet, in the same latitude as the spot, which subsequently would overtake the spot and probably provide some interesting phenomena.

Herr Archenhold observed the spot at Treptow, and recorded its transit at 11h. 35m. (M.E.T.) on July 12; this gives a correction of $+4m.$ to Herr Kritzing's ephemeris. The spot appeared intensely white, without any trace of colour, while the "streifen" appeared to have a rosy-brown hue.

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THE THREE-PRISM SPECTROGRAPH AT MOUNT WILSON.—A most interesting description of the three-prism spectrograph constructed for use with the 60-in. reflector, in its Cassegrain form, at Mount Wilson, is published by Prof. Adams in No. 3, vol. xxxv., of *The Astrophysical Journal*. He also describes the method of working the instrument and reducing the plates, and gives a list of fifty stars, mainly of types A and B, that have been found to have variable radial velocities. The programme of work is directed to the measurement of the radial velocities of stars for which Boss has already determined proper motions, and the results are expected to provide valuable data for the study of star streams. Several stars have been found to have one or more hydrogen lines bright, and a table is also given of seven stars having very large radial velocities. Most of these are of the later types, and show radial velocities ranging from 96 to 170 kms.; their actual velocities in space were calculated and range from 119 to 343 kms. per sec. One star, Lalande 28607, is notable because it is of the A type, and has a radial velocity of -170 kms.; no other star of this type is known to have a constant velocity approaching this in magnitude.

THE INSTITUTION OF MECHANICAL ENGINEERS.

THE summer meeting of the Institution of Mechanical Engineers opened on Tuesday, July 30, in Belfast, and terminated on Friday, August 2. Papers were read and discussed on Tuesday and Wednesday mornings in the Municipal Technical Institute. As is customary during this meeting, a special feature was made of visits to works and points of interest to engineers in the neighbourhood of Belfast.

A paper dealing with rolling-stock on the principal Irish railways was read by Mr. R. M. Livesey, locomotive superintendent, Co. Donegal Railways Joint Committee. Practically the only reason for the construction of a narrow-gauge line is cheapness, and no doubt in certain cases a considerable saving can be effected. But if, as in many instances in Ireland, such railway has to be fully equipped, almost on the same lines as a broad-gauge railway, in order to comply with the somewhat onerous requirements of the Board of Trade, then there is very little to be gained from the point of view of economy. The author quoted one such railway which cost 11,500*l.* per mile, although no really heavy work was involved in its construction. No railway should be built of narrow-gauge if the cost will exceed 5000*l.* per mile, and then only if the proposed line will be for ever isolated from those of standard gauge, and the traffic is always likely to be small. The mileage of narrow-gauge lines in Ireland is 525, nearly all of which is 3-ft. gauge. It seems regrettable that the majority were not linked up to form one large system. The author gives particulars and illustrations of typical locomotives and cars used on these lines.

Mr. W. Redfern Kelly, engineer-in-chief to the Belfast Harbour Commissioners, presented a paper on the new graving dock at Belfast. This dock is the only graving dock in which it is possible to place the *Olympic*, the world's largest specimen of naval architecture. The Belfast Harbour Commissioners have expended on this dock and its collateral works no less than 350,000*l.* The works were commenced in 1904, and were finished in about seven years. The length over all is 901 ft., the breadth is 128 ft. from coping to coping, and 96 ft. at the entrance. Full descriptions and illustrations were given by the author of