of energy, not a series or train of explosions, Dr. McLaughlin stated.

The spectra of two bright novae were carefully examined by Dr. McLaughlin. One of these exploding stars was found in the constellation of Perseus in 1901, the other in the constellation of Gemini, the twins, in 1912. Both stars remained bright only a short time and have since subsided to relative insignificance, the usual procedure for novae.

Light from a shell of gas approaching the earth at the rate of about 400 miles a second was the most prominent feature of the spectrum of Nova Persei. It was present within a day after the star's maximum brightness and still prominent 18 months later. Many years later a nebula with exactly this same velocity was visible, expanding around the star.

There is some evidence of more than one outburst for Nova Geminorum. But all the prominent structural features of the expanding shell were present within four days after the star's maximum light had been reached.

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ASTRONOMY

Hydrogen Gas Robs Star

➤ HOT clouds of hydrogen gas in an active state may rob a star's spectrum of the visible evidence that ample quantities of such elements as calcium, zirconium and magnesium exist in the star.

This theory was proposed by Dr. Jesse L. Greenstein of the Yerkes and McDonald Observatories of the Universities of Chicago and Texas before the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific in Pasadena, Calif.

Most of the stars are much alike in the kinds and amounts of elements of which they are composed. But there are many exceptions. A certain peculiar star, about as hot as our sun, for example, appears to have only about 10% as much calcium, scandium, zirconium, magnesium, titanium and vanadium as does the sun. Other elements, however, are present in normal amounts, Dr. Greenstein found by analyzing spectra taken with McDonald's 82-inch reflecting telescope.

The apparent deficiency of these elements may be only a delusion, Dr. Greenstein reasons. Ionized hydrogen may rob the spectra of the very lines by which astronomers are accustomed to identify these elements.

From below the visible surfaces of stars such as the peculiar one studied by Dr. Greenstein may escape hot clouds of hydrogen gas, itself in an ionized state. This hydrogen, each atom of which lacks its single attendant electron, is greedy for electrons to such an extent that it may rob the nearest atoms of these elements.

The outward flow of some hotter ionized material from the interior of a star may thus upset the star's spectrum.

Brightness of Stars

The all-important relation between a star's brightness and its temperature may be simplified because of observations made by Olin J. Eggen of Washburn Observatory, University of Wisconsin.

Blue stars are known to be hot; yellow and red ones are relatively cool. A normal star of the same color and temperature as the sun probably has the same intrinsic brightness, Mr. Eggen reported at the astronomers' meeting.

In the past some stars of the same color and temperature as our sun have been considered brighter, some fainter. This is due largely to previous errors in measurement rather than to any complex nature of the stars themselves, he stated. Once again observations with the war-developed photoelectric photometer promise to outmode those made by earlier methods.

Stars in the famous cluster known as Berenices Hair and the Hyades, in the constellation of Taurus, the bull, were studied because in a cluster sufficiently far away from us we can assume that all the stars are at about the same distance. Thus distance is eliminated as a factor influencing the star's apparent brightness.

All stars brighter than photographic magnitude ten in the Coma cluster were observed during this study. Only some 50 of the 150 stars in the Hyades cluster were examined, the observing season being one of the poorest in years for Madison, Wis.

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Question Box

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SCIENCE NEWS LETTER

Vol. 54 JULY 10, 1948 No. 2

56,800 copies of this issue printed.

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STate 4439.

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