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THE NEW STAR IN AURIGA.

ON Feb. 2 of the present year Professor Copeland of the Edinburgh Observatory received an anonymous postal card upon which was written the following: "Nora in Auriga, in Milky Way, about two degrees south of Chi Aurigæ, preceding 26 Aurigæ; fifth magnitude, slightly brighter than Chi,"

In No. 1,164 of *Nature* the discoverer of the new star establishes his identity by a short notice of the manner in which he found the Nora. His name is Thomas D. Anderson, and he lives in Edinburgh, Scotland. The following is an abbreviation of his statement: —

"It (the star) was visible as a star of the fifth magnitude for two or three days, very probably even for a week, before Professor Copeland received my postal card. I am almost certain that at two o'clock on the morning of Sunday, January 24, I saw a fifth magnitude star making a large obtuse angle with Beta Tauri and Chi Aurigæ, and I am positive that I saw it at least twice subsequently during that week. Unfortunately, I mistook it on each occasion for 26 Aurigæ, merely remarking to myself that 26 was a much brighter star than I used to think it. It was only on the morning of Sunday, the 31st of January, that I satisfied myself that it was a strange body."

Mr. Anderson then, in a frank manner, speaks of his knowledge of astronomy and the instrumental means at his disposal. Of the former he says, it is of meagrest description, while the latter consist of a pocket telescope and a copy of Klein's "Star Atlas."

Since discovery the new star has been very generally observed at all the prominent observatories in Europe and America. The telegram announcing the discovery was received at the Naval Observatory on the afternoon of February 6. I observed the star the same evening with our 4-inch comet-seeker. To me it then appeared about half a magnitude brighter than Chi, and was of a dark straw color. Using a low-power eye-piece, I could bring both Chi and the new star into the field at the same time. With the meridian transit I observed the star for its Right Ascension, and Professor Frisby, with the 9-inch equatorial, determined its declination. The large transit circle is now dismounted, undergoing repairs prior to its removal to the new Observatory. The place of the star for 1892.0 is, R.A. 5 h. 25 m. 3.4 s.; Dec. $+30°$ 21′ 41.0″. The magnitude was 4.6.

Professor Copeland, upon examining the star with a prism between the eye and the eye-piece of the 24 inch reflector, observed that it seemed to possess a spectrum very much like that of the Nora of 1886, the recognized variable, named Tau Coronæ.

The star was photographed at Harvard College Observatory on Dec. 1, 10, and 20, two months before it was known to be a new star. This came about by Prosessor Pickering and his assistants photographing the region of the sky in which the Nora is located in the course of the photographic mapping of the stars and their spectra now being carried on at Harvard College Observatory. On the 1st of December, 1891, the Nora was faint, on December 10 bright, and on the 20th maximum. Spectrum unique. The above is a statement given out by Professor Pickering.

From No. 3,076 of the *Astronomische Nachrichten* we glean the following interesting points relative to the new star. At Bonn, Feb. 2, Professor Kustner made a careful comparison of the magnitude of the Nora with three neighboring stars. He estimated it as half a magnitude fainter than Chi, little, if any, brighter than 14 Aurigæ, and decidedly brighter than 26 Aurigæ, the resulting magnitude being 5.5.

The region of the sky in which the new star is located was examined for the Bonn Durchmusterung by Schonfeld, March 26, 1856, and Kreuger, Feb. 16, 1857; also again by Kreuger in the revision-zone, March 23, 1858, on which date he observed a star of the 9.5 magnitude distant from the place of the new star 2.5s. and 0.8′. This faint star has, however, been observed anew at Bonn and Hamburg.

At Upsala on Feb. 2 its magnitude was estimated as 5.5, and its color as yellow. On observing its spectrum a very bright line was seen at the red end, and another in the blue-green. On Feb. 3 the star was almost as bright as Chi, but the next night it was fainter.

At Kiel, Mr. Kroeger observed the spectrum on Feb. 2. It was brilliant and visible throughout all the colors from the red far into the violet. A broad, black band was seen near C. In the red and orange there were three groups of lines, separated by equal intervals and of nearly equal width and intensity, all wide, but faint.

Mr. Yendell, living near Boston and an expert in variable star observing, is authority for the statement that between Feb. 9 and 22 the star appeared to him of a bluish white color with no tinge of red. This observation of the color of the star is directly opposite to that reported by the English and German observers, and also that of mine made on several occasions. The star has each time that I have observed it, ten or twelve times, always appeared to me of a dark straw color. I have observed it with two instruments, the 4 inch comet-seeker and the meridian transit. Mr. Lockyer, the English spectroscopist, has secured several photographs of the spectrum. He estimated the color of the star as reddish with a purple tinge. Mr. Fowler, one of his assistants, estimates it as reddish yellow; while another, Mr. Baxaudall, estimates it as purplish.

Mr. Lockyer, commenting upon the photographs taken on Feb. 7, says, "The bright lines *K*, *H*, *h*, and *G* are accom-

panied by dark lines on their more refrangible sides. With the 10-inch refractor and Maclean spectroscope, C was seen to be very brilliant, and there were four very conspicuous lines in the green. Several fainter lines were also seen, and a dark line was suspected in the orange. Mr. Lockyer noticed that some of the lines, especially the bright ones near *F* on the less refrangible side, appeared to change rapidly in relative brightness, and this was confirmed by Mr. Fowler. All the lines in the spectrum of the Nora are broad, although in a photograph of the spectrum of Arcturus, taken with the same instrumental conditions, the lines were perfectly sharp. It is also important to note that the broadening of the lines is not accompanied by any falling off of intensity at the edges, as in the case of the hydrogen lines in such a star as Sirius.

Judging from the testimony here given, it is undoubtedly true that a new star has appeared to our vision, and given astronomers an opportunity to study its make-up. It cannot, however, be said that the object has suddenly come out to its present magnitude. The probability points to the fact that the new star is a variable of long period, and one that at its minimum sinks to invisibility. The verification of this statement must rest upon future observations. We have no record that indicates that a star as bright as the tenth magnitude has ever occupied the place in which the new star has been found. All speculation as to its future history is valueless, because we know nothing of its past history.

The star is now being constantly watched by all the powerful telescopes and spectroscopes of the world, its image is almost nightly caught upon the photographic plate handled by men of experience, and it will not sink back into invisibility without leaving behind a record of great value.

GEO. A. HILL.

Washington, D.C., March 9.

THE TIMBER TREES OF WEST VIRGINIA.

THE Guyandot Coal Land Association, which is the owner of over 200,000 acres of land in the basins of the Guyandot and Twelve-Pole Rivers, in the Counties of Wayne, Logan, and Lincoln, near the south-west corner of West Virginia, has recently had the large timber trees on about 9,000 acres of land counted and measured, thus securing reliable information as to the actual present condition of the Trans-appalachian forests of that region. The diameter of the trees was taken, with calipers, at about four feet above the ground; then the length of the trunks suitable for cutting into logs or for long timber was carefully estimated by the eye of the skilful timber measurer. No trees were measured that were less than eighteen inches in diameter, except the hickories and locusts, which were measured from ten inches and upward. The detailed tables of this counting and measuring have been furnished me for inspection. I think that a summary of the detailed count of the results of the measurements on one single tract will be of interest to the readers of *Science*. For this purpose I select a tract of 655 acres on the top of the dividing ridge between the waters of the east and the west forks of Twelve-Pole River, two miles north-east of the new mining town of Dunlow on the Ohio extension of the Norfolk and Western Railroad, about forty miles by rail south-east from the Ohio River at the new town of Kenova, one named from the abbreviation names of the three States that are there adjacent.

About one-half of this particular tract of land, say 325 acres, lies on the east side of the dividing ridge, slopes from the divide and faces to the north of east, and drains into East Twelve-Pole River. The other 325 acres lies on the west side of the divide, slopes to the south of west and drains into West Twelve-Pole River. The crest of the divide is not far from 1,000 feet above the level of the sea. The following statement shows the whole number of large timber trees now growing on this tract of 655 acres, by kinds and exposures. This tract was found to have growing on it, 16,989 trees; an average of about 26 large timber trees to the acre.

Kinds of Trees.	Western Slope.	Eastern Slope.	Trees of Each Kind.
White oaks	1,256	730	1,986
Chestnut oaks	3,803	2,083	5,886
Black oaks	734	366	1,100
Red oaks	494	242	736
Hickories	1,556	991	2,547
Chestnuts	1,203	697	1,900
Locusts	148	59	207
Maples	224	106	330
Birches	159	174	333
Tulip-poplars	386	472	858
Pines	563	376	939
Lindens	93	74	167
Totals	10,619	6,370	16,989

The proportionate percentage of the hardwood trees of the above table, all those named except the tulip-poplars, pines, and lindens, is quite remarkable. The softwood trees are: 1,042 on the westward slope and 922 on the eastward slope, a total of 1,964, or less than ten per cent of the whole number of trees on the western slope, over fourteen per cent of those on the eastern slope, and nearly twelve per cent of the whole number of trees, leaving over ninety per cent of the westward slope trees and near eighty-six per cent of the eastward slope ones as hardwoods. So these hardwood trees constitute eighty-nine per cent of all the large counted and measured trees now growing on this tract of land. The figures of the table indicate that the large hardwood trees are more abundant on the westward exposure of the dividing ridge.

The record of the diameter and length of each of the trees embraced in the above list, that now lies before me, shows that most of these trees are of large size, the oaks ranging in diameter from eighteen to sixty inches, and in trunk length from twenty to sixty feet. The hickories range from ten to twenty-seven inches in diameter, and from fifteen to sixty feet in trunk length; the pines from eighteen to forty inches in diameter, and twenty to seventy feet in trunk length; and the tulip-poplars from twenty to sixty-six inches in diameter, and from thirty to eighty feet in trunk length.

JED. HOTCHKISS.

Staunton, Va.

THE SPECIALIST.[1]

"MANY scientific men of excellent reputation are to-day guilty of the crime of unnecessary and often premeditated and deliberately planned mystification; in fact, almost by common consent this fault is overlooked in men of distinguished ability, if, indeed, it does not add a lustre to the brilliancy of their attainments. It is usually regarded as a

[1] A few thoughts suggested by the address of the retiring president of the American Association for the Advancement of Science, delivered at the Indianapolis meeting, August, 1890, from which the quotations here given are taken.