

portioned thermal resistance between the heat-receiving surface and the boiling liquid. This was shown by the writer in an article on "A New Principle in the Flow of Heat" in the *Journal of the Franklin Institute*, January, 1918, page 75, and another in *Power* for January 1, 1918. In this way the writer has transmitted heat from a flame to water from 25 to 30 times as fast through the same area of surface.

It seems likely that this supposed high-resistance film is not a true thermal resistance, its estimated resistivity being many times that of good insulators like felt, but that the true explanation is that when hot gases impinge on a relatively very cold surface much of the heat is reflected and but little is transmitted. Perhaps the transference of the momenta of the moving molecules constituting heat is the explanation, in which case that part of the energy which is not transmitted is reflected.

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PHILADELPHIA, PA.,  
February 15, 1918

#### THE AURORA OF MARCH 7, 1918

THOSE who saw the aurora of August 26, 1916, did not expect to see such a display repeated within a life time, but on March 7, 1918, there was a similar spectacle which from reports must have been visible over practically all of the northern hemisphere of the earth. I first noticed the aurora low down in the north, about 7 P.M., but in half an hour clouds had come, which continued for an hour or so. At 9.30 I happened to be out of doors and saw that something startling was in prospect, as the sky was clear and the aurora was growing rapidly. The general effect and appearance of the display was accurately described by Dr. Tomlinson of our geology department,<sup>1</sup> and I shall limit my account to the determination of the position of the radiant or apparent focus of the auroral streamers. It was very striking that just when the display was at its maximum the streamers seemed to come from Saturn.

In the following notes Central Standard

<sup>1</sup> SCIENCE, March 22.

Time, 6 hours slow of Greenwich is used, the position being latitude 40° 6' north, longitude 88° 13' west.

9h. 31m. Streamers rising. Cloud-like form in southeast.

9h. 36m. Radiant exactly at Saturn. Half of sky or more covered. To west and over Jupiter a broad band of red, 10° or 15° wide. This is southern edge of the aurora in that direction.

9h. 41m. Radiant 2° north of Saturn.

9h. 44m. Radiant 2° northeast of Saturn.

9h. 46m. Radiant fainter.

9h. 51m. Radiant has about disappeared.

9h. 51m. All of light is now below Polaris.

10h. 38m. Only faint glow low down.

No further display was noted by our observers at the telescope, who worked until several hours after midnight.

Averaging the three estimates, we have that at 9h. 40.3m. the radiant was 1°.1 north and 0°.5 east of Saturn. The magnetic elements for Urbana are: declination 3° 13' east, dip 71° 5', determined by Mr. Merrymon in 1917, and kindly communicated by the superintendent of the U. S. Coast and Geodetic Survey. From the ephemeris position of Saturn, we readily find then for comparison:

	Declination	Hour Angle
Magnetic zenith .....	+ 21°.2	+ 1°.1
Radiant .....	+ 20°.1	+ 0°.2
Difference .....	1°.1	0°.9

The result shows that within the error of estimate the apparent radiant or focus of the auroral streamers was at the magnetic zenith, which agrees with what was observed in 1916.

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FROM reports it is learned that the aurora borealis seen here on the evening of March 7 was observed at the same hours from New York City to Salem, Oregon, also at St. Louis and as far south as Lat. 36° N., in North Carolina. It was probably seen by observers over an area of greater extent in the United States and occurred also in Europe. This synchronous occurrence seems to indicate a widespread uniformity of the atmospheric conditions which produced it and to offer additional evidence

against the belief, formerly held by some, that this phenomenon is due solely to local conditions.

Here the broad central arc formed low in the northern sky, its highest point being about  $20^{\circ}$  above the horizon and identical in direction with our magnetic north. It first appeared about 8 P.M. and was then most pronounced (though without definite form) in the northwest. In color the light consisted chiefly of white, yellowish green, and dull red but was at no time very bright, though its varied radial streamers attracted much attention. Its maximum was reached about 10 P.M., when it advanced beyond the zenith to a point about  $60^{\circ}$  above the southern horizon and covered the major portion of the sky.

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March 18, 1918

ON the evening of March 7 there occurred at La Crosse, Wisconsin, the finest display of northern lights that the writer has ever seen here. There seems to be no record or remembrance of any equal display. The lights were observed more or less from 7:30 till 12 P.M. The best were seen from 9:45 to 10:45 P.M. During this time shafts of light starting from the horizon would shoot to the zenith. These shafts would be in the north, northeast, or northwest. After these started, others would follow them till three fourths of the heavens were covered with these shafts of light, for they extended south of west and south of east. In the parts of the heavens farthest south the shafts of light were broken just below the zenith but in the other parts of the heavens the shafts were continuous from the horizon to the zenith. The shafts did not flicker or flash as observed at other times but they remained stationary for a period and then died out.

The most remarkable thing was the colors exhibited. After the shafts had been established faint tinges of red appeared which became brighter till the heavens from the northwest to the northeast, and for three fourths of the way from the horizon to the zenith

were covered with a bright crimson red glow. The scene was magnificent and never to be forgotten.

The above light forms would stay for some minutes and then they would all die away and leave only a greenish hue in the north. In a few minutes more all would be repeated again. This repetition was noted several times in succession till about 10:45 it all faded into the greenish hue which lasted an hour.

Other colors were observed as yellows and purples. These were seen as faint light toward the zenith but the prominent color was the red which with the definitely formed shafts gave a special character to these northern lights which will be easily remembered by the observers.

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#### AN OLD RECORD OF ALBINO TURKEY BUZZARDS

THE appearance in *SCIENCE* at intervals during the past two or three years of accounts by various observers of albino birds has interested the present writer very much, and all the more because he has never been so fortunate as to see such a bird. Recently while reading the voyages of Captain William Dampier, his attention was forcibly called to the account by this keen-eyed explorer which is given herewith in the belief that it may prove of interest and value to some of the readers of *SCIENCE*.

Carrion crows are blackish Fowles, about the Bigness of Ravens; they have bald Heads and reddish bald necks like Turkeys. . . . These live wholly on Flesh (and are therefore called Carrion Crows). . . . Some of the Carrion Crows are all over white, but their Feathers look as if they were sullied: they have bald Heads and Necks like the rest; they are of the same Bigness and Make; without any Difference but in Color; and we never see above one or two of these white ones at a time; and 'tis seldom also that we see a great Number of the black ones, but that we see one white one amongst them. The Logwood-Cutters [of Campeachy] call the white ones King-Carrion Crows.

This account is found on page 168 of Volume II. of the 1729 edition of Dampier's "Voyages" as edited by John Masefield and