

Such methods of helping worthy students in geography might well be considered for those specializing in meteorology and climatology.—*C. F. B.*

NOTES ON THE AURORA.

Greatest auroral heights ever determined.—For several years operations have been carried on in Norway by Carl Störmer and assistants to ascertain the height of the auroral rays, which generally accompany great magnetic disturbances. Recently, with seven stations from 26 to 250 kilometers apart, photographs were taken of the aurora; also the angles were found between the stations and the aurora and various stars. From these data calculations showed the upper limits of the aurora to be over 500 kilometers above the earth. Individual computations gave values of 597, 550, 607, 562, 528, 485 and 519 km. altitude.—*R. F. E.*

The aurora and magnetic storm of May 14-15, 1921, "was exceptionally noteworthy in two particulars; first, its accompanying earth currents caused the greatest demoralization to telegraphic communication ever recorded, and secondly it was seen in extreme southern latitudes with all the brilliance usually observed in the north." (H. Lyman).² The display was observed over a large part of the earth, and was brighter in the tropics than perhaps any other aurora on record. At San Juan, Porto Rico (lat. 18° N.), "The sky in the north was brightly alight and seemed filled with golden haze. Five great bars of extra brightness, extending from the horizon to the zenith [!], starting from a common axis, with diverging arcs about equal, extended through the golden haze and gave a wonderful effect." Near Kingston, Jamaica (lat. 18° N.) there were "shafts of orange light . . . reaching an altitude of 40°." On the other side of the equator, the aurora australis at Apia, Samoa (lat. 14 S.), ". . . was an extremely brilliant display, as otherwise it could not have been seen at all in the moonlight, and it is also a very rare event to see this phenomenon in latitudes near the equator."

Loomis, in his "Treatise on meteorology," 1885, mentions (p. 177-178) auroras of August 28 and Sept. 2, 1859 which were seen as far south as Jamaica, though apparently to not so high an angle in the sky.

*Auroras of early September, 1921.*³—A series of almost daily auroras was inaugurated on the night of Sept. 1-2 by a magnificent curtain display, which at Silver Lake, N. H. (lat. 43.9° N.) covered the entire sky except for a segment about 15° high in the south at 2 a.m. (75th mer. time.) The motion was impressive. The gigantic folds of the curtains moved majestically as if in a moderate breeze, while wave after wave of light rose rapidly from the bases.

The general lighting effect of auroral curtains is strongly suggestive of theater foot-lights shining on the folds of a great portiere.—*C. F. Brooks.*

At the time of this aurora I was at [Seabrook Beach, N. H.,] making a series of determinations of the deviations from the great circle bearings of the European radio stations. Throughout the aurora no change amounting to more than 2° of arc was noted [in the wave-front from Bordeaux] and the intensity of the signal was found to remain practically constant.—*Greenleaf W. Pickard.*

"LET US CHANGE THE OCEAN CURRENTS AND OUR CLIMATE."

There seems to be a cycle in the activities of those who would change the course of the Labrador Current and Gulf Stream to improve the climate of New England and the Maritime Provinces. Nine years ago Riker published his project for building a jetty 200 miles across the Grand Banks to divert the Labrador Current; and now the *Sunday Herald* (Boston, Mass., Aug. 28, 1921), following the lead of *Popular Science Monthly*, tells us that "Science [sic!] at last has a definite plan for bringing the nice, warm Gulf Stream to our New England coast.

¹ *Exemples de rayons auroraux dépassant des altitudes de 500 kilomètres au-dessus de la terre.* Geofysiske Publikationer, vol. 2, No. 2, 5 pp., 2 pl., Kristiania, 1921.

² See *Mo. Weather Rev.*, July 1921, vol. 49, pp. 406-409, and *Science*, Sept. 2, 1921, pp. 183-187.

³ See *Science*, Oct. 7, 1921, pp. 329-330.

RESULT—New England will have a climate like that of the Carolinas” etc. This drew the following letter (published in the *Boston Herald*, Sept. 1, 1921):

TO THE BOSTON HERALD:

Ocean currents and climates are ruled by forces too great for control by men. In general, this is enough of a reply to the many baseless statements and speculations in the full-page article “Turning the Gulf Stream to make our climate warmer,” in the *Sunday Herald*, August 28, 1921. Let me add a few detailed comments.

(1) The Labrador Current does not flow thru the Straits of Belle Isle—it could not go thru such a small strait. Therefore, no amount of damming this strait would have any noticeable effect on the Labrador Current, or, consequently on the Gulf Stream or on the climate anywhere.

(2) Even if the current could be prevented by a 200 mile jetty from crossing the Grand Banks, as proposed by Riker in 1919, there is no good reason to believe that it would be turned eastward and northeastward across the Atlantic (as shown in a cut from the August *Popular Science Monthly*), because (a) ocean currents (as well as winds, projectiles and other moving bodies) are deflected by the earth’s rotation to the right in the northern hemisphere, and (b) the cold, dense waters of the Labrador Current now largely dive under the less dense waters of the Gulf Stream, and could continue to do so.

(3) Even if part of the Labrador Current could by some unthinkable means be prevented from moving down the coasts of Nova Scotia, New Brunswick and New England, there is no reason to suppose that the Gulf Stream would come in to this coast, for deflection due to the earth’s rotation is continually turning it away from the coast and the prevailing winds are off-shore and tend to drive the warm, surface water continually out to sea.

(4) Even, still more impossible, if the Gulf Stream did bathe our New England coast there is no good reason to believe that our weather would be moderated: it would probably become more extreme—hotter and more humid in summer and colder and more stormy in winter. Aside from latitude, our climate depends largely on the directions from which the winds blow and their force. In summer our coasts have winds more or less on-shore, off the cool water. Substitute warm water, and they would have weaker and warmer on-shore winds and more of the hot land winds, for the sea-breeze would be weaker and less frequent. In winter the winds are prevailing from the NW. Put warm water in our coast and the greater warmth of the air would make a greater flow of this cold wind off-shore. What the effect would be is shown now to some extent by what happens when the Gulf Stream is warmer than usual. During the first few months of 1916 this was the case, and New England experienced a snowy winter, which apparently has been equalled only three or four times in our history. The snow in southern New England lasted till the end of March.

Why do you publish the opinions of “engineers” on questions of oceanography and climatology? Before publishing opinions on scientific questions why not find out if the men expressing the opinions are authorities in the fields touched on and if they are recognized men of science, *e. g.*, included in the 1921 edition of “American Men of Science.” Is there any reason why what is published in the *Herald* should not be scientifically sound?

Yours truly,
CHARLES F. BROOKS.

NOTES.

The importance of climatic and air conditions to the health of live-stock is not often mentioned. Yet according to a statement emanating from a representative of the U. S. Department of Agriculture (Elmira, N. Y., *Star-Gazette*, Apr. 7, 1921), much of the annual loss of \$200,000,000 directly sustained through animal disease in the United States is preventable through proper attention to housing and climate. Thus: “Tuberculosis is one of the worst scourges among animals and it thrives best in damp, dark, ill-ventilated stables. It is less common among animals running at large. Light, dry, well-ventilated stables and