

much-discussed question of the abnormal aberration of fog signals. It will be remembered that Prof. Joseph Henry, who for twelve years served as chairman of the Lighthouse Board, thought that the wind played a more important part in the abnormal aberration of sound waves than the so-called acoustic clouds described by Professor Tyndall. It is probable that up to a certain point both explanations may hold, but the wind is seemingly the more active factor in most cases. Sound moving with the wind is refracted downward, and moving against the wind refracted upward.⁴

From the great mass of conflicting evidence it appears that a homogeneous atmosphere without the internal stream lines (see reference to this under Air Drainage in previous papers⁵), conveys sound waves very well. But this is not the usual condition. Under normal conditions the mass of air within a mile or two of a lighthouse and extending upward half a mile is neither still nor homogeneous. One of the main purposes of the accompanying fog photographs is to show the stratification, faulting, and upheaval effects, due to differences of temperature and density caused by extensive and rapidly moving currents. Of course the aberration of audibility of fog signals due to changes of the sound-conveying medium is not to be confounded with the aberration in audibility due to topographical features and the normal reflection and refraction

of sound waves. Probably within a short distance of every lighthouse there are zones or points of inaudibility due to the latter causes. An excellent illustration of this can be found in a paper on Fogs and Fog Signals of the Pacific coast by Ferdinand Lee Clarke.⁶ It is there shown that the sirens around the Golden Gate and in San Francisco Bay are inaudible at certain points. Here there is an interference of sound waves due to numerous natural reflections. It has been suggested that if the fog signals at Lime Point and at Point Bonita were properly attuned a resulting harmonic might be heard at certain points instead of the weakened noise now heard. We need measurements of the energy producing the air pulsation, the proportionate energy reaching the ship or given point, and the rate of expenditure with different conditions of density and air movement. By the employment of suitable resonators the pulsations reaching the ship might be more easily detected. With the introduction of wireless telegraphy, it would almost seem practicable to obtain by this same principle of resonance ethereal electromagnetic signals, and by comparing the time intervals between these and the sound waves in air or transmitted through water, the distance apart of the vessels or the distance from the shore might be determined within a few feet.

NOTES BY THE EDITOR.

THE MILWAUKEE CONVENTION OF WEATHER BUREAU OFFICIALS.

After collecting the opinions of a large number of Weather Bureau officials and giving due weight to the inducements offered by local authorities, the Chief of Bureau has concluded that it will be wisest to recommend that the second general convention of Weather Bureau officials be held in Milwaukee late in August or early in September, 1901. In accordance with this recommendation the Honorable Secretary of Agriculture has approved of the proposed convention and has authorized the acceptance of the proffered hospitality of that city. The headquarters of the convention will be at the Hotel Pfister. The freedom of the Milwaukee Press Club is offered to the members of the convention by its President, Mr. W. A. Bowdish. Mr. W. M. Wilson, Section Director at Milwaukee, states that an informal reception and a banquet will be given by the citizens through the Press Club. Those who desire to visit the Pan-American Exposition at Buffalo will, undoubtedly find special inducements in the way of excursion tickets ready at hand. It is probable that three days, viz, Tuesday, Wednesday, and Thursday of the last week in August, or the same days of the succeeding week, but preferably the former, will be sufficient in which to transact the business and pleasures of the convention. Sessions will be held in the morning and afternoon, but not at night. It is hoped that about one hundred officials will be present.

STATION LIBRARIES.

By direction of the Chief of the Bureau, about one hundred selected stations have lately been supplied with the following books: Irrigation and Drainage, by F. H. King. Light, Visible and Invisible, by S. P. Thompson. College Algebra, by E. A. Bowser. Elements of Physics, by Henry Crew. Matter and Motion, by J. Clerk Maxwell. A Students' Stand-

ard Dictionary (abridged from Funk & Wagnalls' Standard). English Grammar, by William Cobbett. Realm of Nature, by H. R. Mill. Elements of Plane and Spherical Trigonometry, by C. W. Crockett. New Astronomy, by D. P. Todd. Text-book of Physics, by W. Watson.

In addition to these, most of the stations had already been provided with the meteorologies of Loomis, Waldo, Buchan, and Scott, Greeley's American Weather, Pope's Electric Telegraph, Abercromby's Principles of Forecasting, Ley's Study and Forecast of Weather, and Rosser's Law of Storms. The section centers of the Climate and Crop Service have also the agricultural works by Storer and Johnson.

Most of the stations also have all the Weather Bureau publications, MONTHLY WEATHER REVIEWS, Bulletins Professional Papers, Annual Reports, Ferrel's Recent Advances in Meteorology, Abbe's Meteorological Apparatus and Methods, Bigelow's Report on International Cloud Observations, Marvin's various Instructions for the use of Instruments and Psychrometric Tables, etc. Those who desire to consult works on meteorology will, therefore, do well to visit the nearest Weather Bureau station.

LECTURES AND INSTRUCTION BY WEATHER BUREAU MEN.

Mr. P. H. Smyth, Observer Weather Bureau, at Cairo, Ill., reports, under date of January 20 that the students of the Douglas School, W. T. Phelps, Principal, are studying the daily weather maps and the work of the Weather Bureau. In addition to the regular instruction, lectures are delivered by Mr. Smyth.

Mr. Alfred F. Sims, Local Forecast Official, Albany, N. Y., lectured on meteorology at the State Normal College, January 28, and before a popular audience on January 25. The latter lecture was finely illustrated with about forty lantern

⁴ Consult article, Sound Signals, by Arnold B. Johnson, Chief Clerk, Lighthouse Board, Appleton's Annual Cyclopaedia, 1883, p. 719.

⁵ See MONTHLY WEATHER REVIEW, November, 1900, p. 492.

⁶ Published in 1888 in San Francisco.