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NOTES AND EXTRACTS.

THE "GUNS" OF LAKE SENECA, N. Y.

In the MONTHLY WEATHER REVIEW for September, 1897, page 393, we have given some account of the "barisal guns," the "mistpouffers," and similar phenomena whose origin is as yet not certainly understood. The following letter describes an analogous phenomenon in Seneca Lake, N. Y., and it may well be that the barisal guns have their origin in the escape of bubbles of gas just as do the "guns" of Seneca Lake.

Mr. Wm. A. Prosser, of Dresden, Yates County, N. Y., writes as follows, under date of August 18, 1903.

So far as I am personally concerned I know of no explosions of inflammable gas, and the newspaper stories are fabrications in this respect.

The "lake guns" are evidently caused by gas escaping from the sand at the bottom.

Long Point is situated about 15 miles south of Geneva, N. Y., and about 25 miles north of Watkins, N. Y., on the west side of Seneca Lake. Directly off the Point the water is very deep. Heavy currents pass either north or south at regular intervals. A heavy wind for a few hours will change the position of the extreme end of land (which extends 1½ miles eastward) several rods. When the swell is not too heavy you can always see the gas rising in bubble form, which, as a rule, makes very little noise, but larger eructations evidently produce these "lake guns." The sand would not stay in place were it not for the water holding it there at the extreme point. Large steamers can land there with but the aid of an ordinary gang plank.

I do not know that the gas is inflammable, but I could easily ascertain if it is of any special interest to you. Natural gas is found in considerable quantity within 3 or 4 miles of the point, on the outlet of Keuka Lake, but hardly in paying quantities. However, I am told that a company has been formed that will exploit the gas along the outlet, but not at the Point.

VARIATION OF GRAVITY OVER THE DEEP SEA.

The last annual report, 1902-3, of Professor Helmert, as Director of the Royal Geodetic Institute of Prussia, mentions the result of the work of Professor Dr. Hecker on the measurement of gravity on the open ocean by the comparison of two methods of determining atmospheric pressure, viz, the observation of the mercurial barometer whose records are affected by gravity, and the determination of pressure by the use of the boiling point thermometer, whose indications are not affected by the variation of gravity. Of course, the aneroid barometer could be used instead of the thermometer, but it is not considered to be so reliable. In fact the temperature of the boiling point can not be determined with sufficient accuracy unless every known source of error is most carefully investigated. Professor Hecker's revised computations give the following results: The excess of pressure shown by a mercurial barometer over the pressure shown by the thermohypsometer, is greater when sailing over the shallow part of the ocean than when sailing over the deep sea between Lisbon and Rio Janeiro. On the voyage southward this excess expressed in millimeters of the mercurial column was $+ 0.017^{mm} \pm 0.015^{mm}$; on the return voyage northward the excess was $+ 0.048^{mm} \pm 0.034^{mm}$. Combining these two results into one average and converting that from millimeters of barometric pressure into centimeters per second, as the unit of the force of gravity, Professor Hecker's observations show that in general, in this part of the ocean, gravity over shallow seas is greater than that over the deep sea by $+ 0.028^{cm} \pm 0.018^{cm}$. The standard force of gravity is 980.6 centimeters per second, so that the diminution over the deep sea is about 0.00003 of gravity, or 3/1000 of one per cent of its full value. From a geographic point of view this result seems to confirm the isostatic hypothesis of Pratt as to the elevations and depressions on the earth's surface. From a meteorological standpoint we see that this change in the force of gravity, as we sail over the ocean, can have but very little influence on the motions of the atmosphere. It is, in fact, of the same order of importance as the gaseous viscosity of the atmosphere, which is sometimes introduced into the equations of motion as friction, but which can be neglected in comparison with the great resistances offered by land *versus* water, mountains *versus* plains, vortical *versus* rectilinear currents, and the mixture of slow moving lower air with rapidly moving upper strata.

WEATHER BUREAU MEN AS INSTRUCTORS.

Mr. Charles Stewart, Observer, Spokane, Wash., under date of July 9, reports visits from schools and teachers as follows:

January 22, 1903.—The class in physical geography of the Spokane High School.

March 28.—The pupils and teachers of the Holmes Grammar School.

April 10.—A number of the teachers attending the Teachers' Institute.

April 11.—A second visit from the members of the Teachers' Institute.

April 20.—The first section of the class in physical geography of the Spokane High School.

April 24.—The second section of this class.

In all cases the instruments and methods of the Weather Bureau and the determination of atmospheric moisture by the whirled psychrometer were fully explained. These visits and explanations are highly appreciated by the community.

THE DROUGHTS OF 1901-3.

The distressing drought in Australia has been relieved in many localities but in others it still continues. Mr. Andrew Noble, of Rozelle, near Sydney, New South Wales, calls attention to the fact that we must study the origin or cause of this drought in connection with antarctic conditions "as bringing about a variation in pressure distribution favorable to drought." The following is an extract from his letter of July 4, 1903:

The late drought has had such far-reaching effects in both hemispheres, as shown by the famine in India and Russia,[1] the lowness of the Nile inundations,[2] and the drought in England,[3] that the student will need to look further and deeper for the solution of the whole problem, and your article on the "Physical basis of long-range weather forecasting (MONTHLY WEATHER REVIEW, December, 1901) shows what a complex problem that is. Dealing with the subject as it seems to affect Australia we find that anticyclones are the controlling force[4] determining our weather, that they are characterized by a steady eastward motion, and that their normal path varies with the sun's apparent journey north and south.

The cyclone only occasionally reaches a full development in our latitude, its place being generally supplied by the V-shaped depression, which remains more or less upright [i. e., capital V with its apex south] if it comes on to our mainland from the Tropics, but inverted [i. e., a capital Λ with apex north] when it approaches us from the southern

[1] The Russian government has to face the problem of feeding 15,000,000 hungry peasants scattered over central and eastern Russia and partly in the southeast and along the Volga; £200,000 worth of rye has been sent out, and the government has bought an additional £1,500,000 worth of rye and wheat for the same purposse. Cattle are dying by the thousand. (Despatch from St. Petersburg, dated December 27, 1902, reproduced in Sydney Daily Telegraph of February 16, 1903.)

[2] The annual inundation of the Nile has taken place and the flood is the lowest that has ever been recorded. (Cablegram in Sydney Daily Telegraph of August 7, 1902.)

[3] This is the seventh year in which metropolitan rainfall has been less than the average. Such a prolonged period of drought is not recorded since 1845. (English Mechanic, December 13, 1901.)

[4] Vide Russell in Quar. Jour. Roy. Met. Soc., Vol. XIX, No. 85, January, 1893.