Cause of a recent period of cool weather in New England.

From Aug. 15 to Aug. 23 the weather in New England was quite cool and pleasant. This cool period culminated on the night of the 22d, when the temperature at the Boston signal office sank as low as 49°. On the signal service weather-chart of the morning of Aug. 23, it is found that the temperature was higher all around New England (north, east, south, and west) than in New England itself. Over New England the sky was clear, and the air was blowing out from this region in every direction, on the east side toward a storm which is central on the ocean, and on the west side toward a storm which is central in the lake region. Whence, then, came this cool air? for it had previously been quite warm. It evidently could not have been imported from abroad: was it, then, due to a descent of cool air from above? This is hardly possible, since it was found, at 11 P.M. of the 22d, that the temperature on Mount Washington was 51°, while at the nearest lower stations — Portland and Boston — the temperature was 56°, and on top of Blue Hill 51°. At 7 A.M. of the 23d the conditions of temperature were almost the same, except that the temperature had risen slightly at every station but Boston. If the air had descended from the height of Mount Washington, it is well known that its compression would have heated it much higher than the temperature was found to be at lower stations, unless this heating had been counteracted by some other cause. On top of Blue Hill the lowest temperature recorded by a self-registering minimum thermometer on the night of Aug. 22 was only 50.5°; while, at a base station four hundred feet lower, the temperature fell to 44°; and in Boston, nearly six hundred feet lower and ten miles distant, the temperature fell to 49°. The thermometers were alike, and exposed in the same manner. The air evidently descended over New England from above, otherwise the wind could not have blown out in every direction; but the statistics above show that its coolness could not have been due to this cause, since it was cooler at the earth's surface than a little distance above it. The air, as was to be expected on account of its descent from above, was clear and dry, the absolute humidity being lower than at any time during the month except on the night of Aug. 15, when almost identical conditions prevailed. Here we no doubt find the cause of the coolness. Tyndall's experiments on the effect of aqueous vapor in intercepting radiation from bodies of low temperature like the earth led him to assert, that, if the blanket of aqueous vapor over England were removed for one summer's night, the whole island would by morning be held in the iron grip of frost, on account of the rapid radiation from the earth's surface which such conditions would permit. Even the more intense insolation by day at such time would be counteracted by the rapid radiation into space, as shown at elevated parts of the earth's surface. This serves to explain the cool period lasting several days in New England; and this cool period seems to substantiate the view recently advanced, that the cold in anticyclones (or areas of high pressure) is due to radiation from the earth's surface, which is favored by the clear, dry atmosphere accompanying these areas. Tyndall, Hann, and Woeikof have adduced evidence of this in Europe, and Mr. Dewey in this country (*see Amer. met. journ.*, May, 1886). H. HELM CLAYTON.

Blue Hill meteor. observ., Aug. 30.

Dr. Orton's Ohio gas and oil report.

I have been carefully studying my friend Dr. Orton's admirable and most valuable report on the Findlay, Bowling Green, and Lima wells, an advanced summary of which you published in the issue of *Science* for June 25. Having been absent from my office, I am ignorant as to whether your subsequent issues contain notices or criticisms of Dr. Orton's facts and views, which I esteem not only historical, but marking an era in our knowledge of the subject. I run some risk, therefore, of offering considerations which others may have anticipated; but two or three of these considerations deserve attention in the present stage of our investigations.

I trust that all geologists will sympathize with me in heartily cheering Dr. Orton's skilful insertion of the long-waited for keystone in the arch of the demonstration of the origin of oil. I am ashamed of my own stupidity in not finding and fixing in its place this keystone myself. I have been seeking it for years, asking myself continually how the decomposing organic matter of the seashores and marshes could be retained by the sands and shales until sufficiently protected from complete oxidation. I have repeatedly put this question to other geologists, but never received an answer of any kind; apparently because so few of them accepted the *in situ* origin of rock-oil, and therefore seeing no value in the question, and no need for an answer to it. Dr. Orton is the first geologist to appreciate the value of Dr. Leidy's observation of the petroleum-mud-layer at the mouth of the Schuylkill River; and his generalization from it is one of the best and broadest ever made in our branch of science. It accounts satisfactorily for the preservation of rock-oils in every formation, of every geological age, all over the world; subject, however, locally or regionally, to subsequent change or destruction. The eruptive rocks (lavas proper) are the only formations not charged with organic matter. Even the tufas, swept by the wind into the sea, must hold the remains of animal air-life and plant pollen. The winds are forever transferring dead and living organisms from place to place, and every rain washes them to the surface of the land and sea to be locked up in clay formations. However different the regional conditions, the process is continual and the results identical everywhere. Compare the Levant with the Red Sea. Each is as large as our Appalachian belt from Canada to the Gulf of Mexico. The one, however, is a reservoir of Nile deposits, — an extension of the Delta under sea-level, — replete with the original stuff of rock-oil. The other is a reservoir of incalculable quantities of wind-deposits, mixed with equally incalculable quantities of tropical animal and vegetable organic stuff. If any one still doubts the *in situ* theory, let him try to invent any other for the vast expanse of petroleum ground on both sides of the Caspian, and of course including the bed of that sea. There, also, we see going on at present the slow process of the loss of rock-oil from a formation which was originally charged with it; and that without any great structural disturbance. In Galicia, in Lombardy, on the other hand, we see the process of loss nearly finished under conditions of structural disturbance so great as to make the dips vertical. If Oken had been a geologist, and were living now, he would probably assert in his next treatise — and with a certain magnificent truthfulness — that the whole crust of the globe consists only of oiled clay, whether siliceous, ferruginous,