

Now this using of food, called respiration, and common to all life, demands the presence of oxygen, and the question has arisen with regard to plants whether this oxygen is derived directly from the free oxygen of the air or is a secondary product resulting from intramolecular decompositions. It has been observed that germinating plants will continue to evolve carbonic acid in an atmosphere of nitrogen or hydrogen, or in a vacuum. Wortmann, observing that the amount of carbonic acid evolved from germinating plants was the same when placed in air or in a vacuum, proposed the theory "that all the carbonic acid produced in plant respiration has its origin in intramolecular decompositions; or, in other words, that the free oxygen of the air takes no direct part in the formation of the carbonic acid in respiration." Dr. W. P. Wilson, an American student at Tubingen, Wurtemberg, has been experimenting upon this subject, and in the *Am. Jour. of Science* for June he gives a condensed abstract of some of his results, which will later be published in full. His experiments show that Wortmann's theory falls to the ground because it is founded upon a fallacy. That there is an intramolecular respiration as differing from a normal is easily proved, but that the amount of carbonic acid given off by the former equals that given off by the latter is untrue, for Dr. Wilson's experiments showed, in every case but one, a rapid diminution in the evolution of carbonic acid when he substituted an atmosphere of hydrogen for air. Hence the conclusion is irresistible that the carbonic acid excreted in plant-respiration is a partial product of direct oxidation from the free oxygen of the air. W. Pfeffer shows that even if Wortmann's experiments had been verified his theory would still fail, because "if an equal amount of carbonic acid were formed in both intramolecular and normal respiration this would only prove that the same number of carbon affinities for oxygen had been satisfied in each case, but would in no way indicate from whence the supply of oxygen came. And in case free oxygen was active in normal respiration, still in intramolecular, when free oxygen was absent, the full supply might yet be obtained through constant powerful attractive forces which could take oxygen from other combinations and in this way give rise to secondary changes." Dr. Wilson's experiments also verify what has previously been taught with regard to respiration, viz., that the presence of light does not in any appreciable degree directly affect the amount of carbonic acid given off, a capital point to use in contrasting respiration and assimilation.—J. M. C.

**Notes from Northern Iowa.**—*Psoralea esculenta*, Pursh, grows on dry knolls, but rarely matures fruit. This plant, the *Pomme de Prairie* of the voyageurs, has large, starchy roots which are quite palatable to a botanist made hungry by a long tramp. *P. argophylla*, Pursh, is much more common than the former, preferring lower grounds. I have not, after three seasons search, been able to find a single mature seed. It must, however, fruit in favorable years.

*Polygonum Hartwrightii*, Gray, is common in bogs. It has flowered here but once in four years—the summer of 1880—and I was then so fortunate as to secure a good supply of specimens. None of the plants matured fruit.

*Helianthus Maximiliani*, Schrad., is very common on the prairies throughout this county. In grain fields it grows much larger, and is almost as troublesome as *H. rigidus*, L. This locality, I believe, is the farthest north from which this species has been reported.

*Lespedeza leptostachya*, Eng., is common on prairies.

*Lophanthus anisatus*, Benth., is found in woods near Estherville.

The peculiar *Lygodesmia juncea*, Don., I have found in a few localities. It chooses the driest knolls, where it seems to lead a precarious existence, so much so that I fear it will soon leave us entirely.

*Liatris punctata*, Hook., produces a large number of stems from the same root; the outer ones generally being nearly prostrate. It is only found on the driest knolls.

*Iva xanthiifolia*, Nutt., has been introduced from the northwest by cattle, and is becoming troublesome in some places. The plant is an annual, and makes a very rapid growth, the main stem often being over an inch in diameter, hollow, and very hard.

*Calamagrostis stricta*, Trin., occurs on wet prairies, a few culms only in a place.

*Bouteloua oligostachya*, Torr., grows on dry, sandy ridges, along with *Carex siccata*, Dew., *Eriogonum serrulatum*, Nutt., and *Castilleja sessiliflora*, Pursh.

In June, 1880, *Senecio palustris*, Hook., made its appearance along the margin of one of our lakes, and also in wet ground near the state line of Minnesota. The larger plants, with hollow stems over an inch in diameter, grew about three feet high, and bore such a profusion of golden yellow blossoms that it was impossible to press a whole plant in a specimen. Last season not a single specimen could be found, which makes me fear that it did not come to stay.

Last season while searching along the margin of a small lake in the eastern part of this county, I came across a *Potamogeton*, bearing an abundance of large floating leaves. I sent it to Rev. Thomas Morong, of Ashland, Mass., who determined it to be *P. Illinoisensis*, described and named by him in the Bot. Gaz., Vol. V, page 50. It was first discovered by Mr. H. N. Patterson near Okawka, Ills., the only other locality known.

In a large bog, three miles from my home, I have found, within a radius of five rods, *Salix myrtilloides*, L., *Scheuchzeria palustris*, L., *Potentilla palustris*, Scop., *Triglochin maritimum*, L., var. *elatum*, Gr., *Eriophorum gracile*, Koch., var. *paucinerium*, Eng., and *Carex chordorhiza*, Ehrh.—R. J. CRATTY, Estherville, Emmet Co., Iowa.

*Osmunda cinnamomea*, L., var. *frondosa*, Gray.—I have had growing in my yard for a number of years (brought originally from Pennsylvania) a fine clump of *Osmunda cinnamo-*