glomerate, so that we are able to parallel the eastern and western series with certainty.

The Mesontaric thus becomes a unit of remarkable symmetry. It may be likened to a parabola, which, springing from the marine fauna of the Guelph dolomite, ascends through one Eurypterid fauna (the Pittsford-Shawangunk) to a culmination centrally in the barren salt beds (Syracuse) and descends through a second Eurypterid fauna (the Bertie) to a return of marine conditions with *Halysites* and other Niagaran types in the Cobleskill dolomite, itself lithologically not unlike the Guelph.

Unpublished studies by the writer on the Port Ewen fauna have shown its many affinities with that of the overlying Oriskany limestones as known at Glenerie and Becraft's Mountain. Dr. Clarke has, therefore, recommended the transfer of these beds to the Oriskanian, in spite of the preponderance of Helderbergian elements. The oft-mooted pertinence of the Esopus to the Oriskanian also appears to be affirmatively settled, at least for its lower portion, by the writer's finding of Oriskany fossils (*Leptocœlia flabellites, Chonostrophia,* etc.) forty feet above its base near Leeds, Greene Co. *Taonurus caudagalli* occurs in the Oriskany limestones at Glenerie.

In the Rondout region the last-mentioned beds, which may now be formally christened as the Glenerie limestone, are underlaid by eighteen or twenty feet of pebble-beds, typically exposed on the hill above South Rondout (Connelly post-office) and in the creek bank opposite, for which the name Connelly conglomerate is proposed. Southwestward, as at Cottekill, this latter appears to give way to shaly limestones exactly resembling those of the underlying Port Ewen, but having a strongly Oriskany fauna, and it is suspected that these are the equivalent of Barrett's *Dalmanites dentatus* zone, herein designated provisionally by the name Port Jervis.

The new name Kalkberg limestone is proposed to cover certain layers heretofore included variously by writers with the beds above or below (New Scotland and Coeymans) and carrying a mixed fauna, highly developed and excellently silicified on Catskill Creek. Here the beds show numerous thin parallel seams of black flint nodules; below these are fourteen feet of typical Coeymans, without flint, and above them are the typically shaly layers of the New Scotland. A similar association has been found at the Indian Ladder and elsewhere. The fauna is one of the most interesting and abundant in the region and combines *Sieberella galeata* with *Bilobites, Nucleospira, Delthyris, Dalmanella, Rhipidomella, Rhynchospira,* etc. The name Kalkberg (lime hill) is the local Dutch designation for the Helderbergian ridge, and is pronounced Collak-barrakh.

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Observations upon a Yellows Disease of the Fall Dandelion

The fall dandelion, *Leontodon autumnale* Linn., is becoming one of the worst of the introduced weeds of certain sections of Maine, in meadows, along roadsides and in lawns. This is particularly the case on the lawns of the University of Maine, where the bright yellow flowers are very conspicuous from August till late autumn, in spite of frequent mowing.

Here the plant is affected with a "yellows" disease which the writer has had opportunity to observe for the past two seasons. The diseased plants are very characteristic and conspicuous because the foliage becomes much lighter colored and yellowed and tends to grow upward into a rather compact mass, especially if not cut back by the lawn mower. The plant reacts to the stimulus of the disease by producing an abnormal number of leaves and flower heads, particularly the latter. As a rule the scapes are considerably shortened and the flowers abortive, but plants only slightly affected are occasionally observed to form seeds.

These weeds were very plentiful on the lawns in the fall of 1906 and from 30 per cent. to 50 per cent. of the plants were diseased.

In 1907 there was a decided falling off in number, with respect to diseased as well as healthy plants, the proportion of the former being plainly less than in the preceding season.

On account of the obscure nature of this type of disease, its similarity to aster yellows and kindred troubles, and more particularly on account of the abundance and availability of the material a series of observations and experiments covering a number of years were planned. The outcome of one of these experiments was as follows:

In September, 1906, a number of vigorous, healthy young plants were carefully taken up and transplanted to the corner of a garden. They were placed close together, making a continuous row four or five feet long. Next plants showing early or at least not advanced stages of yellows were selected and transplanted with equal care so as to form a row on either side, parallel with, and about six or eight inches removed from, the row of diseased plants. None of the plants showed any ill effects from the transplanting. In the spring of 1907 nearly all of the diseased plants were dead and the remainder failed to survive the season. All of the healthy plants survived. They have shown no signs of yellows to date and are now strong and vigorous. A portion of the plants will now be removed from the row and placed in the rows where the diseased plants stood.

It is hoped that later work upon this disease of a more fundamental nature may be undertaken with added facilities in the shape of a greenhouse for pathological purposes and complete equipment for histological work.

W. J. MORSE

MAINE EXPERIMENT STATION

A PRINCIPLE OF ELEMENTARY LABORATORY TEACHING FOR CULTURE STUDENTS

DURING recent years, courses for culture students in the biological sciences have been widely introduced into the schools and colleges of this country. The results attained do not measure up to what was hoped for by those who placed them there. Probably no one would be more ready than the better teachers to admit that the average student, to a discouraging degree, comes short of acquiring that information or developing that power of obtaining knowledge for himself which it was planned that he should.

The difficulty is not trivial and it is not imaginary. It is one which should receive serious consideration at the hands of those whose business it is to teach. The present paper is offered as a contribution toward its solution.

One university professor of botany expressed to the writer the opinion that courses in botany are justified by the fact that some who are not adapted to other studies are awakened and develop in scientific work. The writer has known shining examples of such; their proportion, however, is small, and it seems self-evident that the teacher can be content with nothing less than to reach and to bring out the average student who comes into his classes.

The situation can best be stated by taking a concrete illustration. Suppose then, a young teacher with university training, high ideals and a certain individuality. He surrounds himself with his students, places material in their hands and asks them stimulating questions whose answers they can find out. He plans courses which include morphology, physiology and evolutionary relationship of plants. These subjects are sometimes segregated, sometimes (as their arranger thinks) ingeniously interwoven. The teaching proceeds through weeks and months. Looked at as a whole, what is the outcome? Something as follows:

The success of certain of the lessons is immediate and convincing. Perhaps, for example, those upon the morpho-physiology of seeds or upon winter buds, catch the interest of the class, incite independent effort and show every sign of living in the minds of the student. On such days the teacher tastes that fine joy which is said to be his chief reward, mingled it may be with sinful pride and a commiseration for students less fortunate than his own.