it was easily interpreted that the discoloration and loss of leaf by the plants in the greenhouse was the direct effect of an abnormal absorption of water induced by the unaccustomed high temperature acquired by the small quantities of soil in the pots. The attempt was made to give the plant more nearly the normal conditions of temperature, and at the same time grow it in culture solutions. Since it is found in very moist localities the latter condition offered no violent changes to the habits of the plant. Ordinary culture jars of a capacity of one liter, provided with zinc tops, were used. The diageotropic rhizomes were imbedded in asbestos fibre in a sunken chamber in the zinc tops in such manner that the fibrous roots depended into the fluid beneath. The jars were set their full depth in a roomy box full of porous soil. By means of a constant drip from a water tap the earth was kept saturated, and by reason of the initial low temperature of the water and the rapid evaporation the fluid substance was kept quite cool. So nearly does this meet the natural conditions of the plant that specimens several years old were lifted from the soil in the woods and successfully grown by this method. The writer now has several plants which have been under such treatment during a period of nine weeks. They are of normal size and stature, and at this date (December 18) exhibit a number of flowers, opening buds and maturing seeds, while the development of the roots can be followed with the greatest ease. This method has been used by students in water culture experiments with the cultivated plants very successfully, and by its use it has been found possible to bring under continuous observation during the winter season several species of hardy native plants. In investigations on material of this kind it is believed it will prove valuable.

Work Shelves for Laboratory. By Katherine E. Golden.

These are shelves which were constructed in such a manner as to do away with all vibrations from the floor and walls. This object was attained by the use of iron pipe. Round holes were cut through the floor, through which were driven two iron pipes, two and one-half inches diameter, into the ground beneath to a depth of about three feet. If the ground were very firm, a lesser depth would do. The pipes were left a convenient height above the floor. Heavy planks had holes bored in the two ends, through which the pipes fitted closely, the planks being held firmly in position by means of clamps placed beneath them. By means of the clamps the height of the shelves can be varied at any time to suit one's convenience. This kind of shelf is preferable to that which is suspended from the walls of a building, as the latter vibrates with the building.

One pipe would be sufficient for a small table, so that one might thus utilize a small corner of a room. Pipes driven into the ground are, of course, practicable only when the laboratory is on the ground floor and does not require too great an extent of the pipe above the ground.

The special features of these shelves are their cheapness, the carrying of a number of shelves on the same pair of pipes, and the ease with which they can be fixed up, so that one might readily set up shelves for different pieces of apparatus.

I use the shelves for work where a plant is on a lower level than the apparatus used with it. This result is gotten by boring a hole through the shelf and fastening the rod of a ring-stand in the hole with a nut. The ring can then be adjusted to any height on the rod.

Figure 1. Respiration Apparatus.

New Apparatus for Vegetable Physiology.[1]

By J. C. Arthur.

[Abstract.]

The following apparatus was described: (1) A respiration apparatus to determine the amount of carbon dioxide exhaled by breathing plants within a certain time at a fixed temperature, the baryta method being used; (2) a centrifugal apparatus for revolving growing plantlets at a high speed, to replace gravity with a similar force, that may be varied at pleasure, in order to determine its effect in giving direction to the forming organs of plants; (3) a gas chamber to supply different gases to living tissues under the microscope; (4) a slide with binding posts to convey a current of electricity through living tissues under the microscope; and (5) a hygrometer to exhibit the comparative rate of evaporation of water from the two sides of a leaf. An instrument of each kind was exhibited, except the first one mentioned, which was illustrated with a drawing.

1. The Respiration Apparatus consists of a small glass chamber in which the seeds or other growing parts are placed. This is suspended by means of a brass cover, in an outer jar containing water of suitable temperature. The respiration chamber is connected through potash bulbs and a wash bottle with an aspirator, so that to begin with, all carbon dioxide may