surface occupying the original position produced by aggradation from the ranges to the west.

Still more significant is the fact that the crest of the westernmost of these scarps, that is, the one closest to the mountain range, is at a lower elevation than the one farther east toward the center of the basin, by about fifty feet.

Many observers have described scarps in bolson deposits as wave-cut lake cliffs. And there are, of course, in the arid southwest, many unmistakable old shorelines of former playa lakes now extinct. The fact, however, that these scarps, both of which are on the west side of the basin and face eastward, show long and fairly even backslopes to the west in the direction from which the sediments making the floor in this part of the basin probably came, surely indicates that they are not wave-cut cliffs of now extinct lakes, and points very conclusively to post-bolson faulting, which has produced the cliffs and tilted the floor of the basin.

The fact, also, that, though both scarps face east, the crest of the western one is at a lower elevation than that of the eastern is quite as indicative of fault origin.

It is therefore believed that there has been faulting in the area, not only recent enough to displace the bolson floor, but so fresh as to have permitted but little dissection of the scarps since the faulting. The region is so arid, however, that it is difficult to estimate how long ago that might have been.

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## FENSTREAMS

IN Virginia there is a broad overthrust fault by virtue of which the Cambro-Ordovician limestone has been shoved northwestward more than ten miles across younger formations. In Montgomery and Pulaski counties there are four areas several miles back from the northwestern edge of the overthrust limestone from which the limestone has been removed by erosion, producing fensters—windows in the limestone through which the underlying younger rocks are exposed. Streams, meandering on the peneplained limestone, were let down on to the shales and sandstones of the younger formations, retaining the drainage pattern of the limestone streams. Subsequently, these superimposed streams adjusted their courses to the softer strata, but are still crossing enough hard beds to prove their superimposed character. There has been thus produced a type analogous to superimposed streams, but differing from them in that the superposing strata are older instead of younger than those on which the drainage is superimposed. For this type of stream the name fenstream (fenster stream) is proposed.

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## SELECTIVE ABSORPTION OF IONS NOT CONFINED TO YOUNG ROOTLETS

IT has been generally understood that the selective absorption of ions by plants is entirely a function of the absorbing tissue of the youngest and most active rootlets and is confined to a more or less restricted zone lying close behind the subapical growing region and usually characterized by the presence of root hairs.

In studies conducted, during 1932, at the Boyce Thompson Southwestern Arboretum, results were obtained which conflict with this traditional view. By cutting off the young, unsuberized portion of Citrus and Vitis roots and carefully sealing the cut ends, selective absorption of phosphate and nitrate was found to take place in the woody parts of the roots. This was demonstrated for small seedling trees and for single roots of large trees growing both in the field and in concrete lysimeters. Briefly, the experimental procedure was to excise the younger part of the root; carefully seal the wound; place this sealed root in a nutrient solution of known concentration, containing both nitrate and phosphate; and to determine by chemical analysis the rate at which these nutrients were removed from the nutrient solution. By using colorimetric methods now available, it was possible to determine minute changes in the nutrient solution, and thus establish the fact that ion absorption was selective.

So far as is known, this experimental procedure has not been employed previously in differentiating between ion absorption in the area of root elongation and the older parts of the root.

These experiments have now been extended to include a number of additional plants and not a single exception to the above observation has been found.

One important phase of this work has dealt with temperature effects. Selective absorption was found to occur not only within the temperature range of root elongation but also at non-killing temperatures above and below this range.

The above observations have been confirmed by numerous repetitions and modifications in experimental technique, with particular attention to the possibility of bacteria or fungi reducing the ion concentration of the nutrient solution, and we are firmly convinced from these data that selective absorption is not a function of young, elongating rootlets only.

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