

pages 28 to 33, the conclusion has been reached that here, also, the gumbo is so related to the drift that it is undoubtedly the thoroughly weathered product of the Illinoian drift.

As a result of the field investigations and the chemical studies it is now proposed that the somewhat indefinite term "gumbo" be no longer used for these super-drift clays, but that the name "gumbotil" be used. Gumbotil is, therefore, a gray to dark-colored, thoroughly leached, non-laminated, deoxidized clay, very sticky and breaking with a starch-like fracture when wet, very hard and tenacious when dry, and which is, chiefly, the result of weathering of drift. The name is intended to suggest the nature of the material and its origin, and it is thought best to use a simple rather than a compound word. Field work has already established the fact that in Iowa there are three gumbotils, the Nebraskan gumbotil, the Kansan gumbotil and the Illinoian gumbotil.

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#### THE EVOLUTION OF HERBS

THE article by Edmund W. Sinnott, published last week in *SCIENCE*, 44: 291, supports conclusions on this subject arrived at from quite a different standpoint.

The idea that trees are primitive forms is involved in the proposition advanced by Henry L. Clarke, in the *American Naturalist*, 27: 769-81, September, 1893, that in their order of blooming the generalized precede the specialized.

My observations were based only on entomophilous flowers, 493 native and 61 introduced.

If we assume that the earliest, least specialized, and primitive plants form the earliest maxima and succeed in regular order, we shall have for indigenous plants the following results according to the time of the maxima:

|                           |                       |
|---------------------------|-----------------------|
| Trees .....               | April 27-May 8        |
| Woody climbers .....      | June 13-15            |
| Shrubs .....              | June 21-23            |
| Perennial herbs .....     | August 2-6            |
| Annuals and biennials ... | August 30-September 6 |

And this seems to be the probable order of their development. The original plants having the most freedom developed large size and occupied the most favorable positions. The less favored could become reduced to shrubs and finally to herbaceous perennials, and occupy many positions which were unfavorable for trees or with which trees did not interfere. The habits of perennial herbs are better understood if we suppose that they had to compete with trees, or rather avoid competition with them, from the first. The annuals developing later were able to find many temporary situations unfavorable for woody plants or perennial herbs. The primitive Angiosperms were probably trees, like Magnoliaceæ, Anonaceæ and Lauraceæ.

Another general characteristic of blooming seasons is that the earliest, most generalized, most primitive plants have the shortest seasons, while the most specialized, most recent, and latest arrivals have the longest seasons. Arranging the vegetative forms according to their average blooming seasons, we have the following order:

|                            | Days  |
|----------------------------|-------|
| Woody climbers .....       | 36.5  |
| Trees .....                | 39.4  |
| Shrubs .....               | 42.7  |
| Perennial herbs .....      | 57.1  |
| Annuals or biennials ..... | 75.1  |
| Cosmopolitan .....         | 80.4  |
| Introduced .....           | 117.3 |

Except for trees and woody climbers, the order is the same as for the maxima.

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CARLINVILLE, ILL.,  
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#### HORSE FLESH AND THE DIET OF EARLY MAN

TO THE EDITOR OF *SCIENCE*: In *SCIENCE*, for September 22, is published a letter on the "Animal Diet of Early Man," which discusses the subject with reference to possible evidence drawn from tapeworms and their hosts. In this connection, the writer of the letter speaks of the horse as food, as follows:

There is nothing to show that horses were not eaten, unless the rather widespread abhorrence of eating horse flesh at the present time can be con-