

power of intimidation and "bluff" which can not be generated by a single individual or family group. Perhaps groupings of this sort, with some faint instrumental inclinations of a dim "eolithic" nature, may successfully have pursued small game and the young of larger mammals. Cliff and cave refuges may have contributed to their survival.

Their odd continuance into times late enough to have brought them in contact with more advanced and truly human forms is by no means their least interesting feature. What curious reactions must have been observable if either group ever encountered the other—the savage first men and these living fossil ancestors of the Pliocene, still apes but more human than any now alive. Was it man himself who swept them out of existence? Probably we shall never know.

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"DORMANT" VERSUS "ADVENTITIOUS" BUDS

A RECENT note by Diehl¹ on the sprouting of a stag-horn sumac (*Rhus typhina* L.) log begins thus: "Sprouting of adventitious buds in logs or twigs of woody species freshly cut . . ." With no other comment concerning the origin of the sprouts in sumac, the implication is that they, too, are *adventitious*. As the species grows in New York State, however, most and perhaps all of the sprouts found on older stems have arisen from dormant buds.

It would seem profitable to restrict use of the term *dormant* or *latent* to buds formed in the axils of leaves (including scales) on the young annual shoots. These buds then persist in a dormant condition for an indefinite time with only sufficient elongation of their steles to keep the buds outside of the enveloping xylem. *Adventitious* buds, by contrast, arise outside of the normal phyllotaxy. It is recognized that adventitious buds, once formed, may also remain dormant, as is true of the root initials in the bark of willow stems. Where the origin is in doubt, or an inclusive term is desired, *epicormic* is advantageous and non-committal.

A considerable amount of unnecessary confusion has arisen from the loose or mistaken usage of the term "adventitious," particularly when the origin of the buds or sprouts in question has not been known. Foresters frequently have been at fault in this respect, but they are not alone. A popular botany text² makes the statement "They [adventitious buds] also give rise to the common water sprouts of apple trees and other species," although, as a matter of fact, water sprouts in apple are clearly from dormant buds.³

¹ W. W. Diehl, *SCIENCE*, 96: 2498, 448-9, November 14, 1942.

² J. Hill, L. Overholts and H. Popp, "Botany," p. 138. New York, 1936.

³ V. T. Stoutemeyer, *Iowa Research Bull.*, 220: 308-52, September, 1937.

Similarly, the stem sprouts of oak⁴ and probably most hardwoods of the northeast,⁵ as well as pitch pine⁶ (*Pinus rigida* Mill.), arise in general from previously existing dormant buds, rather than adventively. In the trunk and branches of apple true adventitious buds do occur rarely in the bark but their usual origin in hardwood stems is from callus masses. A familiar example is the abundance of adventitious shoots from the callus on a cut stump of beech (*Fagus grandifolia* Ehrh.).

This question of terminology is not wholly academic. A large proportion of the northeastern hardwood forest is of sprout origin, and sprouting following thinning or pruning is of concern to both foresters and horticulturists. Reliance on literature requires that terms be specific.

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ACIDITY AND ACTIVITY OF SULFONAMIDES

RECENT work¹ has shown that a definite correlation exists between the bacteriostatic effectiveness and acid ionization constants of sulfonamides. The functional form of this relationship indicates that the drug activity is the resultant of two opposing tendencies, one of which increases effectiveness as the pK increases and the other of which decreases effectiveness. In view of the current opinion that sulfonamide activity is due to the blocking of an enzyme system,² it was considered advisable to examine the available data from the point of view of the general concepts of acidity³ and the law of mass action. Interestingly enough, this fundamentally simple approach leads to qualitative and quantitative predictions which are in good accord with the available facts.

Qualitatively speaking, one would expect the compound of intermediate pK in a group of sulfonamides of widely varying pK to be most effective in producing bacteriostasis, from the following considerations. If the sulfonamide, HD, is a weak acid, then the anion, D⁻, may be treated as a base. Similarly, the enzyme, or protein, P, can combine with OH⁻ and hence may be considered an acid. If P is an acid and D⁻ is a base, compounds of the type PD⁻ may be formed. If we assume that the activity of the drug depends on

⁴ E. R. Roth and B. Sleeth, *U. S. D. A. Tech. Bull.* No. 684: 4, October, 1939.

⁵ M. Büsgen and E. Münch, "The Structure and Life of Forest Trees," pp. 73-74. New York, 1931.

⁶ E. L. Stone, Jr., and M. H. Stone, *Am. Jour. Bot.*, 30: No. 4, 1943.

¹ Bell and Roblin, *Jour. Am. Chem. Soc.*, 64: 2905, 1942.

² Woods, *Brit. Jour. Exptl. Path.*, 21: 74, 1940; Fildes, *Lancet*, 238: I, 955, 1940.

³ Lewis, *Jour. Franklin Inst.*, 226: 293, 1938.