Comments and Communications

A Note on "Why Vegetation on Watersheds?"

The writer would like to add a couple of items apparently overlooked in the recent note by Chapman Grant (*Science*, October 29, p. 486). First, watersheds that have reservoir storage for the entire annual precipitation are quite rare. In southern California a large part of the water conserved is put underground by percolation of slowly released impounded stream flow. Complete storage is unnecessary as long as the entire season's precipitation does not come at once and is not turned immediately into stream flow. It is the watershed vegetation that slows down the runoff to make storage less extensive and expensive, and that makes long-continued percolation to underground storage possible. Second, the gunited or tin-roof type of watershed has not proved desirable. Residents of the desert areas of California and along the Wasatch front in Utah have suffered severe floods from denuded watersheds. In many cases the affected communities have gone to great effort and expense to get a cover vegetation re-established. As the cover has come back, flood damage has been reduced.

Research findings show that, though vegetation does take its toll of the water supply in arid regions, the residual water is almost all usable. Where the vegetation is gone, stream runoff often becomes flood flow. Such a flow is usually entirely wasted, except for percolation underground, and, in any event, is contaminated with a heavy load of silt and debris at nearly all stages. Interested Californians might well review the watershed studies carried on by the Forest Service at the San Dimas Experimental Forest near Los Angeles.

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Antigen Films and Long-Range Forces

In a recent note (*Science*, July 30, 1948, pp. 107–108) Karush and Siegel produce evidence from electron microscope studies of deposited protein monolayers that the monolayers on glass slides are not smooth layers of uniform thickness. The protein layers are apparently irregular in thickness with ridges or peaks which, in extreme cases, may be as high as 200 A. They assume from this that when multilayers of barium stearate are deposited on this irregular monolayer, the ridges or peaks project *through* the barium stearate layers. On the basis of this assumption they challenge the necessity for specific long-range forces as postulated by Rothen (*Science*, November 2, 1945, p. 446; *J. biol. Chem.*, 1947, **168**, 75) to explain the specific interaction of an antibody with the antigen layer, through the intervening layers of barium stearate.

There is no apparent justification for this assumption of Karush and Siegel. On the contrary, it seems unlikely that the peaks of the protein layer will project through any monolayer deposited on it. It is well known that, when monolayers are deposited onto a solid plate from a liquid surface, the deposition ratio is almost exactly unity (cf. Langmuir, *et al. J. Amer. chem. Soc.*, 1937, **59**, 1751). This is true if the "solid plate" is a fine wire gauze so that the monolayer does not even follow the contours of macroscopic irregularities on the plate surface. The film is stretched across the tops of any peaks or ridges.

Karush and Siegel observed ridges which were generally between 50 and 85 A high, and there is therefore no reason to suppose that these would have any effect on a monolayer deposited on the protein film. If the protein film is ridged, it means that the bulk of the protein will be even farther away from the antibody than is indicated by the thickness of the "barrier" layer.

If the explanation of Rothen's results is to be found in some penetration of the barrier by antibody or antigen molecules, then a more probable mechanism could be provided by the crystallization of the barrier layers. Multilayers usually form microcrystals which are continuous through the thickness of the multilayer, and so there will be intercrystalline boundaries extending from top to bottom. It is conceivable that one or more active groups of the antibody could penetrate at one of these boundaries. It does not seem necessary for the initial "hole" in the barrier to be large enough for a complete antibody molecule to get through. If a particularly active group can approach near enough to the antigen, it is possible that the forces brought into play are large enough to extend the "hole" so that a considerable amount of antibody could then penetrate the barrier.

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Precedence of Modern Plant Names Over Names Based on Fossils?

James M. Schopf has proposed an amendment to the International Rules of Botanical Nomenclature to the effect that names based on recent material should always take nomenclatural precedence over names based on fossil or subfossil specimens (*Science*, April 2, 1948, pp. 344–345). "Always," in this connection, obviously means even that the law of priority may thereby be violated. In *Science* (October 29, 1948, p. 483) the author reports a "generally favorable" reception of his proposal.

Both proposal and reception seem deplorable from a strictly nomenclatural point of view. They seem to be based on the "natural but mistaken assumption that types are somehow typical, that is, characteristic of the groups in which they are placed," and on the fact that "types . . . are by many students supposed to be not only name-bearers but also the bases on which group concepts are erected and the standards of comparison for those concepts" (Simpson. *Bull. Amer. Mus. nat. Hist.*, 1945, **85**, 29). The primary and only function of types, how-