In the making of photomicrographs of recent or fossil specimens we have to face conditions very similar to those just described. The innumerable elevated microscopic grains on an ordinarily rough surface catch light on their summits and scatter it as do motes in a sunbeam. This light caught on a photographic plate swamps the detail which lies just under these summits. If our specimen is of calcite a thin outer layer is practically transparent, and with the light scattering reduced, we should get some structural detail just under the surface itself. In this way we secured a view of the sutural canals of *Palaeocrinus striatus*, Bill., and their membranous linings in (1911), plate V, fig. 2, while only the canal coverings were visible where the gum was not used, as in fig. 1 of same plate. Compare also figs. 3 and 4 of this plate. In 1913 (*a*) plates 6 and 7, we illustrated the difference in effect secured when this process was used on very recent material. In same reference, in plates 3 and 4, we also showed the value of being able to penetrate thin sheets of calcite adhering to the surface of a mold. Its value in revealing features just underneath the surface was also shown in 1913 (*a*) plate 10. Sometimes we desire just the surface contours or topography,and we may then add to the reflecting points by using the Williams process (holding the specimen in the combining vapors of ammonia and hydrochloric acid). We may thus avoid all stains or detail in colour and get pure form. If, however, we are to do something more than simple species-making, we should desire the detail due to difference in tone or hue. For instance, in the author's work on Blastoidocrinus and Paleocrinus (1911), he found internal organs outlined with black and partially filled, by respiratory and alimentary processes, with mud now yellow with limonite. The contrast between ossicle and decayed soft tissue could have been reproduced almost as pure white and black, or very like the results obtained in 1913 (*a*), plates 7 and 8.

The better to compare these two methods we may suppose that a dweller on the moon desires to photograph the earth. If he could but find the illuminated hemisphere covered with cloud he could eliminate surface stain and get pure but very general form. On the other hand, could he find a hemisphere free from cloud he could get general form plus many differences due to hue and tone. He would have the deeper, truer surface, the detail of mountain and valley, and a very significant difference between sea, mountain top, Sahara and valley of the Amazon.

The ability by means of this process to reduce the amount of reflection from the microscopic facets of granular surfaces