of plant tissue cultures either do not qualify or have not yet been adequately tested to be classified as cytokinins.

The term *cytokinins*, therefore, is intended to correspond to the term *auxins*, which likewise includes a chemically heterogeneous group of natural and synthetic substances with biological activity like that of 3-indoleacetic acid, and to the term *gibberellins*, which refers to still another group of chemically related substances with distinctive physiological properties.

As the term cytokinin was selected after much consultation and deliberation, we hope it will be favorably received by all workers. To avoid further confusion with animal physiology and within our own field, we urge that it be adopted, and that the use of the term kinin and various other synonyms to designate kinetin-like growth factors be discontinued.

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Spore Discharge

The recent report by Savile on "Spore discharge in basidiomycetes: a unified theory" (*1*) omits pertinent data presented by myself (*2*) and others, without which it is difficult to see how a unified theory is possible.

After saying that the bursting gas bubble at the spore apiculus would deliver its blow transversely or diagonally and could therefore hardly supply the main propulsive force, "which acts along the axis of the sterigma," Savile develops an additional hypothesis to explain the outward propulsion of the spore on the basis of forces of abstriction and repulsion, involving electrical charges within the spore apparatus.

In my own account, I have repeatedly stated that the explosion of the bubble is probably not the only force contributing to discharge, but that residual gas under pressure within the spore apparatus (between inner wall and outer membrane) at the time of the explosion is also a contributing factor. It could be the primary factor in propelling the spore outwards. The force from the bursting bubble, however, might be expected frequently to cause the spore to veer away from a line of discharge parallel to the axis of the sterigma. Savile states that "almost all spores are discharged directly away from the hymenium (along the axis of the sterigmata) with impressive regularity," although Buller (*3*) presented evidence that the spores may be shot away diagonally from the basidium.

Savile's theory involving forces of abstriction and repulsion is admittedly conjectural. But he believes it to be supported by the fact that "the sterigma tip is snapped by abrupt bending" when the bubble bursts. However, this fails to take into account my observation that at the time of spore discharge there no longer appears to be any connection between the inner wall of spore and sterigma. This would mean that the only remaining connecting structure at the time of discharge is the outer membrane, whose rupture is instigated by the bursting bubble.

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References

1. D. B. O. Savile, *Science* **147**, 165 (1964).
2. L. S. Olive, *ibid.* **146**, 542 (1964).
3. A. H. R. Buller, *Researches on Fungi* (Longmans, Green, London, 1909), vol. 1.

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In reference to Olive's first point, he said in his paper: "This small explosion, in addition to some residual pressure in the remaining gas layer, is apparently the main force that ruptures the outer membrane just below the spore and propels the spore from its sterigma." The reader may make what he will of the parenthetical clause, but the main sentence seems unequivocal in meaning. Its author now suggests that gas within the "spore apparatus" plays a part. If he means to imply a jet discharge, this explanation seems to be nullified by maintenance of turgor in the sterigma.

Possibly Olive's belief that Buller demonstrated diagonal discharge rests on study of Fig. 52 of the cited volume. In the illustrated experiment spores were discharged upward and drifted back to the hymenium. The hymenium was enclosed in an illuminated cell in which convection current inevitably acted upon the falling spores. The common observation that spores from a mushroom gill adhere in groups of four to an adjacent slide supports my contention of directed discharge. If a basidium projects beyond its neighbors the sterigmata might flare outward and the spores might discharge at an angle to the basidium, but still along the axis of the sterigma.

The sterigma wall is generally thin and, even in cytological preparations, distinction between primary and secondary layers may not always be clear. A tenuous wall of some sort must maintain the connection between spore and sterigma until the moment of discharge.

If I had been able to prove my proposed mechanism, which is not of the existence of a repulsive force but of the maintenance of a morphologically demonstrated force for a short additional period, I should not have been obliged to present it as a theory. It was so presented in the hope that, among the wide readership of *Science*, someone might devise a test.

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