This Week’s Citation Classic

O’Brien T P. The cytology of cell-wall formation in some eukaryotic cells. 
Victoria, Australia]

The review concluded that ‘the published literature did not allow us to 
decide whether the cellular sites of synthesis and/or transport of cell-
wall precursors are recognizable differentiations of the cell,’ and 
was highly critical of unwarranted speculations based on electron 
microscopy and autoradiography. [The SCI® indicates that this paper 
has been cited over 75 times since 1972.]

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“This article grew out of an in-
vited symposium address given at 
the International Botanical Con-
gress in Seattle in 1968. Several 
months after that Congress, the 
editor of Botanical Review asked if 
I would prepare a review on the 
subject of the symposium.

"I was more than happy to do so. 
The period 1959-1966 had seen an 
explosion of papers applying per-
manganate fixation (with all of its 
artifacts) and, latterly, glutaralde-
hyde-O₂O₄ fixation (with fewer 
artifacts) to tissues engaged in 
cell-wall synthesis. I was not very 
pressed with the standard of 
much of that work for it seemed to 
me that a lot of it represented bad 

science. The interpretation 
dynamic events from electron 
micrographs is always difficult and 
much of the literature glossed over 
the difficulties. The review was 
rather critical (I have little time for 
uncritical reviews that are simply 
extended bibliographies) and set 
out in plain language what could 
and what could not be deduce 
safely from structural 
observations. I was especially 
keen to stop what I called 
'metamorphosis of speculation 
into "facts," upon which are 
erected further speculations that 
undergo further metamorphosis.' 

"I heard through the grapevine 
that one or two of my colleagues 
were upset; several others wrote 
commending the article, and say-
ing that they were using the paper 
as a discussion paper in classes. 
That was gratifying; one does not 
hope to readily change opinions of 
one's colleagues, but as long as the 
young are exposed to another 
view, the future seems to look 
after itself.

"A decade has passed since it 
was written and I am pleased to 
say that unwarranted speculation 
in plant cell biology has dimin-
ished. I imagine the review was 
widely read and cited partly 
because it was provocative. If it 
helped to check the drift into un-
warranted speculation so evident 
in the early 1960s, then that was a 
good thing, and few reviewers 
could ask for more. An updated 
view is given in a chapter on 
growth and division in plant cells 
in the forthcoming book by H. 
Smith and D. Grierson."1