

This Week's Citation Classic

Parsons T R, Stephens K & Strickland J D H. On the chemical composition of eleven species of marine phytoplankters.

J. Fish. Res. Board Can. 18:1001-16, 1961.

[Fisheries Research Board of Canada, Pacific Oceanographic Group, Nanaimo, British Columbia, Canada]

Eleven species of phytoplankton representing five different classes of algae were analysed for their chemical constituents. All analyses were performed on cells growing exponentially. The results showed that marine phytoplankton have very similar organic composition when grown under similar conditions, regardless of either the size of the phytoplankton cell or the class to which it belongs. [The *SCI*[®] indicates that this paper has been cited over 180 times since 1961.]

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"In 1958, I obtained a PhD in biochemistry from the faculty of medicine, McGill University. All of my colleagues who obtained doctorates at about the same time were most anxious to start careers in medical research, where the promise of achieving distinction, including the remote possibility of a Nobel prize, was open to all. I chose to enter the field of biological oceanography for which I was much derided by my colleagues, who couldn't see the remotest connection between a PhD dissertation on the etiology of silicosis and a career in biological oceanography. In fact, there was very little connection between the two but in 1958 potential oceanographers were hired from the ranks of respected disciplines. My background in biochemistry together with my own highly personal belief that biological oceanographic research was more interesting than medicine set the stage for the publication cited above.

"In order to break into a new field I felt that it would be necessary to write a com-

prehensive work that people would notice. Since I had no philosophical background in biological oceanography, I studied the limited amount of literature that was available in order to discover some leading article which might both inspire me to research, while at the same time fall within my capabilities as a freshman PhD.

"In my search of the literature, one person stood out whose professional background as a chemist was not too far from my own. In 1884, Dittmar¹ published a report on the chemical composition of seawater. He analysed 77 samples which had been collected from around the world during the famous voyage of *HMS Challenger* and his results were widely quoted in every text I could find.

"Not being able to repeat Dittmar's first, I looked around for a somewhat comparable situation in the more biological world to which I belonged. My choice for a comparative analysis fell on different classes of phytoplankton, there being in 1958 no widely held view of what, if any, were the basic differences in the chemical composition of phytoplankton of different classes and different sizes. About two years after starting my analyses, I was able to report on a reasonably wide range of species with respect to their major biochemical constituents. I believe that the subsequent frequent citing of these analyses is because they give marine organic chemists as well as algal physiologists a baseline appreciation from which to discuss the value of their own work on the cycling of organic materials in the sea. As a paper, however, I am not particularly proud of its content because it lacks any philosophical rationale; unfortunately, those papers that I have written containing what I believe to be some philosophical insight on biological oceanography have not merited the *Citation Classic* recognition.² In one way, however, this might be considered reassuring to science in that facts are obviously more appreciated than speculations!

"For a recent review on the chemical composition of particulate material in marine environments, see Riley and Chester³ or Bougis."⁴

1. Dittmar W. Report on researches into the composition of ocean-water collected by H.M.S. Challenger during the years 1873-1876. (Murray J, ed.) *Report on the scientific results of the voyage of H.M.S. Challenger: physics and chemistry*. London: HMSO, 1884. Vol. 1. Pt. 1.
2. Parsons T R & Strickland J D H. On the production of particulate organic carbon by heterotrophic processes in sea water. *Deep-Sea Res.* 8:211-22, 1962.
[The *SCI* indicates that this paper has been cited over 130 times since 1962.]
3. Riley J P & Chester R. *Introduction to marine chemistry*. New York: Academic Press, 1971. p. 182-218.
4. Bougis P. *Marine plankton ecology*. Amsterdam: North-Holland, 1976. 355 p.