Eppley R W. Temperature and phytoplankton growth in the sea.
Fish. Bull. Nat. Ocean. Atmos. Adm. 70:1063-85, 1972.
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An empirical equation was developed to predict the maximum expected specific growth rate of ocean phytoplankton as a function of water temperature. The relation is useful in setting upper bounds on expected rates of ocean photosynthesis. [This paper, cited over 220 times, is the most cited ever published in this journal.]

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I've always been proud of this little review, and so it is especially pleasing that it has been frequently cited. It is the first think piece I attempted, with no new data or coauthors nor any external motivation.

The purpose of the paper was to (1) suggest the maximum growth and photosynthetic rates that might be reasonably expected for natural marine phytoplankton and (2) to point out interrelationships among growth rate, photosynthetic rate per weight of chlorophyll, and the compositional carbon/chlorophyll ratio in the plankton. There was also another motive: the information presented could be used to check on the validity of other people's measurements of photosynthesis made at sea.

The paper has been frequently cited because it provides a target, namely, an equation that predicts an upper limit to be expected for the growth rate of phytoplankton as a function of temperature. Thus, if one's data suggest a higher rate, the observation may be publishable as an example of the unusual. Also, people working in polar waters have found comfort that the low rates of photosynthesis they measure are real and expected.

The work was done at the Scripps Institution of Oceanography in the Food Chain Research Group of the Institute of Marine Resources. It was prompted by observations in the literature that ocean primary production varied little as a function of temperature. Similar rates were found in polar, temperate, and tropical seas. Clearly phytoplankton growth-rate processes vary with temperature as do other metabolic processes, so some explanation was needed as to why temperature seemed to be of so little importance for ocean photosynthesis.

No particular honors or awards have been associated with the paper and models of phytoplankton growth have progressed well beyond this simple treatment.[1]

At the time, there was no obvious journal for such a piece. I fretted considerably over where I might submit a short, speculative, unlikely paper such as this one. It used other people's data, was heavy on computer-generated graphs (thanks to programmer Elizabeth Stewart), and concerned a topic of apparently little interest. Finally, my colleague Reuben Lasker, then editor of the *Fishery Bulletin*, agreed to consider it, although it had little to do with fisheries. Fortunately, he sent it to sympathetic reviewers. One of these was T.R. Parsons who helped with the mathematical presentation.

1. **Laws E A, Redalje D G, Karl D M & Chalup M S.** A theoretical and experimental examination of the predictions of two recent models of phytoplankton growth. *J. Theor. Biol.* 105:469-91, 1983.

