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Changing pH in the Surface Ocean

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In 1896, Arrhenius provided the first roughly quantitative sense of the plausible magnitude of human-induced changes in the concentration of CO₂ in the atmosphere. Since then, all chemists could be aware that increasing CO₂ in the atmosphere must lead to increasing amounts in the ocean and a corresponding increase in acidity. For a long time, however, no one appears to have thought much about this latter consequence, probably because the likely effects were small and were, in any case, rather troublesome to calculate. It was only in 1909 that Sørensen proposed the concept of the pH scale. The negligible level of concern about the effect of CO₂ on Earth's heat balance was not much affected by the work of Callendar (1938), who argued that the increasing concentrations in the atmosphere could be observed and would be significant. The radiative balance calculations of Plass (1956), published in *Tellus*, began to influence those who read such journals, and the beginnings of the Keeling curve brought widespread attention to the increasing atmospheric CO₂ concentration.

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