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Atmospheric chemistry: from the age of description to the age of prediction

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In the past 18 months there have been serious efforts to elevate the scale of research in the atmospheric sciences to confront global-scale problems of CH_4, CO_2, and N_2O increases in the troposphere and stratosphere, shifts in biogeochemical cycles at the surface, and coupled photochemical changes throughout the atmosphere. Questions raised by these changes challenge, and often find inadequate, the frontiers of our understanding in a multitude of subjects ranging from microbiology to gas-phase free-radical kinetics.

One global-scale problem that draws from both the instrumentation and the theoretical structure of modern chemistry, biology and geophysics is that of stratospheric ozone. Recent developments in this field including advances in satellite, balloon-borne, and ground-based experimental methods as well as model calculations will be discussed in the context of moving from a descriptive science to that of predicting secular trends.