

Preface

One day in late 1993, the latest issue of *Nature*, the British magazine of science, arrived on my desk. Staring up at me from the cover was a photograph of a crystal of a rare mineral called zircon, lined with criss-crossing cracks. Because I had once been a practicing geochemist, the caption of the photograph, "Fingerprinting Impact Debris," told me the news: at last we know what happened to the dinosaurs! Some 20 years before, I had left college teaching and research for administration, becoming a dean, a provost, and then a college and museum president. But my love for the Earth and for teaching had not waned. Now, reading the *Nature* article, I thought of writing a book that would explore how something as apparently unrelated to dinosaur extinction as a crystal of zircon, had in fact helped to decipher the great puzzle. This way, I would return to my roots as a geologist and teacher.

I had no idea just how far the story would reach. I would cover the entire span of geologic time, from the beginning of the solar system, forward to the great mass extinction at the end of the Cretaceous Period (when the dinosaurs and 70% of all species died), and on to the mass extinction that is going on today. I would write not only about vertebrate paleontology, but micropaleontology (a completely different field), geological age-dating, astronomy, rare metals, nuclear explosions, evolution, statistics, and more. I would show how the suggestion that the dinosaurs died in a catastrophe brought on by the collision of an extraterrestrial object, stirred the deepest resentment among geologists. I would find myself describing not the work of stereotypically-dull scientists, but flesh and blood combatants who hurled the most venomous scientific insults at each other. Most importantly, I would follow a debate that revealed to an unusual degree how science really works—and not up in the ivory tower, but down in the dirt.

The story would turn out to be important not only because it reveals what happened to the dinosaurs, and how science works, but because it contains lessons for us today. The great extinction at the end of the Cretaceous Period was one of several in which more than 50% of species died. Those that survived were not fitter—they were just luckier. One particularly fortunate group was the Late Cretaceous mammals, our ancestors, who moved into the ecological niches left vacant by the absent dinosaurs. Without the chance event that killed the dinosaurs, there is no reason to think that they would have

evolved into the only sentient creature in the universe, as far as we know, *Homo sapiens*.

Our species is the only one able to learn from the past and to consider the effect of our actions on the future. We know that the greatest extinction since the end-Cretaceous is taking place today, caused by decisions that we make daily. The species lost will never return, for extinction is a one-way ticket to oblivion. One can approach this current mass extinction from the perspective of science, and contemplate the vast span of geologic time and the beauty of the evolutionary process that has brought us the rich diversity of life on Earth. Or, one can find the hand of God in Nature, and turn to Scripture for guidance, to find this verse among many that apply: "What therefore God hath joined together, let not Man put asunder." (Matthew 19:6) Though typically applied to couples when they marry, might it not have a broader meaning? Whether we view extinction from viewpoint of science, or from the perspective of religion, we are brought to the same conclusion: one species has no right to cause the extinction of another. To do so is a crime against Nature, or against God, or against both, as you choose to believe. Unlike every species that has gone extinct up to now, we know that we are in the midst of a mass extinction and that we are its cause. Have we not a moral obligation to act? Otherwise, how will we be judged by our grandchildren, and by God?