

# ETHICS IN RESE



# ARCH?

by Roald Hoffman  
Illustration Brad Holland



1

**T**he world that my great-grandparents were born into 150 years ago in the Austro-Hungarian province of Galicia, or the world of the backwaters of Zaire today, was not a romantic paradise. It was, and for too many today it remains, a brutish, inimical environment. Perhaps one lived in balance with it, but with a life span far from biblical. One only has to read the heart-breaking diaries of our ancestors, to see the tragedy of seven children out of eleven dead before puberty, of child-birth a killing prospect.

In this century science and technology, and chemistry in particular, have transformed the world. A doubling of our life span; less death and suffering; birth control; a greater color palette to lift the spirit; freedom from the smell of sewage; a way to cure much, not nearly all, disease; air, light, and food for all; and food for the soul in the Ramayana on the screen or a Mozart rondo in the air — these are things of which chemists really can be proud.

Is this then a time to praise, or a time to fear? Should we continue what has worked so well, to make every molecule that we are capable of making?

To fear? Yes — what we have added to the world, mostly for the best of reasons, is in danger of modifying qualitatively the great cycles of the planet. We see the effects of our intervention in the change in the ozone layer, the pollution and acidity of our waters, in why we wash an apple, in the crumbling statuary, our heritage, dissolving. And we also use our transforming capacity destructively—to annihilate a quarter of the species in this world, to hurt

