

Mind The Shade

This guest editorial by Roald Hoffmann, professor of chemistry at Cornell University and 1981 Nobel Laureate in Chemistry, is one in a series intended to bring the views of chemical community leaders to C&EN readers. Hoffmann's most recent book coauthored with Shira Leibowitz Schmidt, "Old Wine, New Flasks: Reflections on Science and Jewish Tradition," was reviewed in the Oct. 6 issue of C&EN.

S entenced to create—be it molecules, or laws, or paintings you may love or hate—we give in, with feeling, make new substances, transform old ones. Still others in the economic chain sell them; I teach about them. Each of us has a role in the use of chemicals. That use does immense good. And just sometimes does harm to people or property. Even though molecules are molecules, not in and of themselves good or evil.

What is an individual chemist's ethical responsibility when this occurs? Well, each of us confronts ethical questions in the light of his or her traditions. Nothing is simple when goods collide. I don't want to preach; the only advice I would presume to give is: "Mind the shade."

Let me explain. Political campaign ads to the contrary, very little in this world is pure good or pure evil. Yet evil gets done. No, it is not the work of Satan; it is the work of pretty normal men and women, who are likely to be kind to their children and goldfish. And those who mean ill intuitively know that responsibility for exploitation or hurt had best be diffused, so that an individual in a necessarily long chain be little tempted to see the ethical consequences of the whole.

Also people intent on no good construct, subconsciously, for themselves (and their collaborators) a mind-set that transforms the act psychically, taking it outside some personal ethic. In the analysis of evildoing by real people, not comic-book characters, one finds incredible compartmentalization, and the fanning of dehumanizing prejudices. Why? To self-justify actions that—in another part of life, dealing with others—would clearly be counter to the ethics that everyone, even evildoers, carries around.

Given this tendency of evil to diffuse and transform itself, it is precisely those actions that are ethically gray or shaded, neither clearly good nor bad, which should be thought through in greatest depth. If there be a data point that indi-

cates disagreement with a theory, or hints at side effects of a drug, shall I discard it before I tell my supervisor? To do so seems easy, so harmless, especially when little is certain. There will be other tests, right? But the cumulative effects of such selective shading may be disastrous.

Have I conveniently put the burden of ethical judgment on the chemist in industry rather than the academic? And am I constructing a guilt-ridden world where people are to be condemned, by others or themselves, for innocent creation that is used for evil purposes by others? Let me try to work through these concerns.

The mass production of a substance affects many people, and I think indeed needs to be subjected to greater ethical scrutiny than an individual action. But the initial discovery—even if it be just a playing out of curiosity—is not devoid of ethical content either. A common distancing strategy is to say, "Oh, I just made that, I couldn't imagine it would be misused." My personal response is, "Yes, that's true, you (the maker of the HCN in Zyklon B, the tobacco farmer) are not *legally* responsible. Your *moral* responsibility for misuse may be tiny, or it may be substantive. That needs to be negotiated in a dialogue with yourself, with the help of those who give you counsel. At the least, it should serve as a small mental red flag the next time you make a molecule."

I am aware that we do not need more sources of incapacitating guilt. And the situational complexity of ethical decisions is immense. The job that may be dangerous to oneself, producing something capable of misuse, may be the only way to feed a family.

Small things, small decisions. In the shaded areas, where nothing is clear. That's where real, tough ethical decisions are made. We should be grateful that we are presented with choices that only human beings can make.

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