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Environmental Chemicals' Hazards Still Little Known

THE CONSERVATION of our genes from the impact of environmental damage has urgent human importance at two levels. One is the concern that all parents must have for the health of the children they wish to produce. The other is the social and material burden of handicapped and retarded children. Furthermore, no one can be totally indifferent to his responsibility as a vessel of the species, to a role in human evolution that answers to the most profound religious instincts.

Research geneticists are beginning to speak up more and more pointedly about their concerns for genetic hazards. Not too many years ago, I was able to compartmentalize my own thinking to such a degree that I did not immediately grasp the relationshop between an abstraction, like the statistics of "lethal mutations" in fruit flies, and the human impact of malformation in the newborn. The current generation of young scientists is less likely to miss such connections.

HOWEVER, we all have a basic responsibility to go beyond an emotional expression of concern; to use it to energize the search for authentic scientific measures of potential hazards and for means to neutralize them.

Unfortunately, just as many academic scientists have rediscovered the importance of relating basic science to human needs, the political establishment which controls the purse strings has turned away—perhaps in bafflement or resentment at the difficulties that more careful scientific thinking discovers about the world we make for ourselves. Yet to ignore new viruses arising in nature may conceal them from being promptly seen but will not make them disappear. Nor will blinking them change the facts—only our insight into them— about the importance of viruses, food additives or drugs as agents of genetic damage.

We biologists have still not done the badly needed job of assessing the really important hazards of environmental chemicals in such areas as cancer, teratology (embryo damage) and mutation. We do know that these effects are often associated with one another, so that when cyclamate derivatives are proven to break chromosomes, we should be alert to cancer potential.

The legally rigidified concept that any agent must be banned if it "causes" cancer in any test animal at any concentration makes sense if the agent acts directly on cells, but in the absence of basic biological knowledge, it is a show of desperation of policy that may well be distracting attention away from the real culprits.

WE DO HAVE a few fundamental tools today, especially in genetic studies of cultured human cells, that might begin to clear things up. We can also be looking more closely at the foundamental chemistry of DNA.

For example, a report that LSD forms chemical complexes with DNA in the test tube (Dr. T. E. Wagner in Nature magazine in June) was somewhat surprising, and puts more weight on claims that LSD breaks chromosomes. Even more recent work indicating that a whole class of related compounds, the tryptamines, which occur naturally in the brain, also react with nucleic acids may unify these findings. We have still to work out how these agents can affect brain function at all in such low concentrations, and nucleic acids in brain cells may well be their targets.

A group of geneticists and cell biologists headed by Dr. Alexander Hollaender, retired director of biological research at the Oak Ridge National Laboratory, has organized a new "Environmental Mutagen Society" to help further the scientific understanding of these difficult problems. Such a group will fill a vital function if it does nothing more than provide a channel for communication among a wide range of separate disciplines; the DNA biochemist ordinarily does not have his attention directed to matters like outbreaks of chromosome diseases of newborns.

It is not likely that we will—and certainly we do not wish to—learn very much about genetic hazards from observations of catastrophes in human populations. We have a great deal of taxing work ahead in trying to set up scientifically valid and politically useful criteria from laboratory studies for these elusive but all-important hazards.