LETTERS

XYY Chromosome Study

The ethical objection of Beckwith *et al.* (Letters, 31 Jan., p. 298) to the Harvard XYY study appears to be based upon a simplistic notion of distinguishing the behavior of people either on the basis of genetics or on the basis of social, economic, and familial conditions. Possible effects of the interaction of genetic and social factors are overlooked.

Beckwith *et al.* assume that the design of the study precludes obtaining information about the effects of informing parents about the XYY chromosome. This assumption is probably incorrect. It is likely that some of the informed parents will believe that the XYY chromosome is related to antisocial conduct and others will not, just as there is disagreement among scientists. And some parents may in the course of the experiment change their opinion about this. Thus, the beliefs and related child-rearing behaviors of the parents in the study will probably range along a continuum, allowing a meaningful assessment to be made of any effects of child-rearing practices and of the XYY chromosome.

Genetic and ethical problems do not go away by ignoring them. They should both be subject to thoughtful investigation which balances the risks of knowledge against the benefits, if any, of ignorance.

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Accountability in Science

The recent disclosure of yet another possible breach in the integrity of scientific research raises some hard questions about the public's right to oversee the conduct of science. Both in the Summerlin affair of last April, in which a Sloan-Kettering cancer researcher was given a psychiatric leave after tampering with skin-graft data, and in the current case at Harvard, in which a student is suspected of forging experimental results, the research in question was supported both directly and indirectly through public funds. Yet, the actions which have been taken to date have involved internal "housecleaning" with little or no public access to the facts or involvement with the issues. Why should research scientists be any less accountable to the public for the consequences of their misconduct than are physicians, lawyers, or politicians?

Some maintain that scientists should be sequestered from malpractice or malfeasance by virtue of the impersonal and indirect nature of their work. Behind such a proposition lies the false assumption that scientific data, in contrast to the surgeon's scalpel, "never hurts anyone. After all," the argument goes, "it's the use that's made of science that deserves our scrutiny, not basic research." But ethical judgment is needed at the basic research level as well. Those who practice it know that the nature of the scientific enterprise itself hinges on the scrupulous integrity of its practitioners. Scientific accountability begins at the research bench. One false lead can cost science (and society) years of potentially constructive work.

It is no accident that the current disturbing events are occurring in transplantation immunology, a field still in its infancy. Transplantation immunology may now be in the same inchoate and explosively expansive stage that genetics was in in the Lysenko era of 25 years ago. When "normal" science, as Thomas Kuhn (*1*) described it, begins to falter, as new data repudiate old hypotheses, then basic research takes on new meanings—and basic researchers, new responsibilities. Immunologists today are struggling for coherent theories to incorporate seemingly divergent data. They are met at every turn by paradoxes and anomalies. The immune system can seemingly be turned to good or evil by a quirk of happenstance. Clinicians do not know how to predict when an immune response to a virus may cause a disease or cure it; or if they generate an immune reaction, whether it will stimulate cancer growth or retard it. Reproductive biologists are met with paradoxical success in the survival of the immunologically discrepant fetus and remain ignorant of the adaptive role of the mother's immune response.

Historians of science would recognize in these perturbing uncertainties a scientific field in flux, an old paradigm collapsing, and tentative new models proliferating. It is at just such a time that a field becomes most vulnerable to chicanery and deceit. Total objectivity becomes difficult for even the most scrupulous practitioner. Often it is im-