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A summary of these findings, related to both recent and ancient continental margins, is the subject of this book.

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LETTERS

Harvard XYY Study

We feel that the report by Barbara Culliton (News and Comment, 22 Nov. 1974, p. 715) on the XYY study being carried out by Walzer and Gerald of the Harvard Medical School does not clearly lay out the nature of the study and its implications, nor the basis of our objections. We and others in Science for the People have been concerned with both the premises and the social and political applications of certain programs of research into genetic factors in human behavior.

Implicit in these programs are the assumptions that we can and should attempt to distinguish between the behavior of groups of people on the basis of genetics. Many of these programs tend to focus the blame for supposed antisocial behavior on the genes of the individual, rather than on social, economic, and familial conditions. In the case of the XYY controversy, this orientation has led many researchers to hasty and far-reaching conclusions based on uncontrolled and biased experiments. In fact, the most recent and comprehensive review of the XYY literature concludes that "... the frequency of antisocial behavior of the XYY male is probably not very different from non-XYY persons of similar background and social class" (1).

The Boston study is a case in point. Walzer and Gerald are trying to determine whether there is any psychopathology associated with the extra Y chromosome. The study is funded by the Center for the Study of Crime and Delinquency of the National Institute of Mental Health. Those parents whose child is found to be XYY are told that the child has a chromosomal abnormality, and many specifically learn that it is XYY and of the conflicting information on this subject. It has already been reported that giving such information to parents induces anxieties about the child's behavior that would not have existed otherwise (2).

How is the researcher to know whether behavioral problems that arise in the XYY children are due to the extra Y chromosome or to the impact on the parent-child relationship of telling the parents of the abnormality? Certainly not by controls: there are no control parents who are told that their child is XYY. Thus the design of the study precludes the possibility of obtaining any information about the presumed

relationship between the extra chromosome and the child's behavior. Yet in Culliton's report, the XYY myth is perpetuated by references to unspecified behavioral problems in some of the boys being followed. These statements lend stronger credence to the stigmatization which XYY males currently suffer.

Our original criticisms were concerned, in part, with the absence of informed consent. The procedures have very recently been altered in response to our objections. However, irrespective of the details of the new consent procedures, mothers are still led to believe that the benefits of taking part in the study outweigh the risks. Since there is no XYY syndrome and no possible benefit can accrue to the family. To the contrary, the myth of the "criminal chromosome" is so well known to the public that families in this study are put at substantial risk of psychological and emotional damage on learning of the child's extra chromosome.

In summary, this study cannot yield meaningful results, has no benefits but substantial risks to the families involved, and only serves to propagate the damaging mythology of the genetic origins of "antisocial" behavior.

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2. G. H. Valentine, M. A. McClelland, F. R. Sergovich, *Pediatrics* **48**, 583 (1971).

Beckwith and his associates are entitled to interpret the literature on the XYY syndrome as a "dangerous myth," but they have no right to force their interpretation on others. Their view that knowledge is a danger from which the public needs protection is the same force that keeps textbooks out of West Virginia schools and leads to the type of academic McCarthyism that prevents Shockley and others with unpopular interests from fulfilling speaking engagements in our colleges.

Of course parents are entitled to an honest explanation of the proposal test and the option to reject it. However,

those parents who want information on the sex chromosomes of their infants are entitled to have it and the investigators must be entitled to provide it for them.

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The controversy over the ethics of identification and study of individuals of XYY karyotype is an example of our fascination for the exotic problems to the neglect of common but more serious genetic conditions, such as the XY karyotype that afflicts roughly half of the human race, including the writer.

Overwhelming statistical evidence indicates that the XY karyotype is associated with major social problems such as violent crime and war. If we are to provide medical and psychiatric assistance to XYY individuals, let us not neglect the XY's, who in aggregate present a much greater problem for the community.

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Protein Production

For a considerable amount of time we have been reading about the world food shortage and how the United States could be of assistance in solving the problem. Most often our agricultural methods of protein production are under attack. It has been stated that feeding grain to animals is an inefficient and wasteful means of raising protein. Moreover, it has been repeatedly expressed that we should raise more cereal for export and less for feedlot purposes. Rothschild (Letters, 6 Dec. 1974, p. 870) repeats these concepts.

Most statements regarding the conversion of grain to animal protein seem to be the result of armchair opinion, with little mention of where the protein that is responsible for our high standard of living should come from. One can only surmise that, instead of grain feeding, one would have to resort to grazing. However, the crux of the matter is overlooked. The amount of grain raised on 1 acre will feed six to eight times as many cattle as would 1 acre of grass

in most places in the United States. In fact, on the intermountain plain and the high plateaus of the West, this ratio would be even higher. In addition, it takes nearly twice the amount of time to bring a calf to market weight when it is fed grass than when it is fed grain.

These are the economics of cattle raising and explain why animal protein is reasonable in price and available to most American households. Raising cattle on grass would not only increase the production cost, but would also reduce the available supply. This would result in greater price being demanded for animal protein that would be of poorer quality. Paradoxically, Rothschild's own "oxen" would be gored, and not those of the agricultural producer.

It is high time that the proposal that we not raise cattle in the feedlot be discarded as a false illusion and an unrealistic approach to solving the food shortage. Agriculture in the United States has proved to be the most efficient in the world; reverting to methods of the turn of the century will not solve the problem of hunger. A good point to consider is that a U.S. farmer can feed 61 people with his modern advanced methods, while a farmer in the Soviet Union can only feed 7 people. I agree that better education of the public with regard to nutrition is an aimable goal that deserves consideration, but also the adoption of successful U.S. agricultural methods should be seriously considered by other governments.

I know of no way other than by consuming animal protein that humans can obtain the amino acids they need, short of eating a large variety of cereals and legumes. There is simply not enough tillable land to meet this need. Only by producing sufficient animal protein can the world standard of living be raised and adequate nutrition supplied.

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Computer-Assisted Education

In her reply to Zelby's letter, Ruth M. Davis (Letters, 13 Dec. 1974, p. 975) says, "when computers . . . hold the questions, record the answers . . . [t]hen the real, comforting interactions can be between people." Indeed, but if the computer holds the questions, and the student is only exposed to the questions held by the computer, then a

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