Letters

McGovern's Conversion Program

The report "McGovern: Conversion spells upheavals for scientists" (News and Comment, 11 Aug., p. 504) contains several questionable conclusions concerning the consequences of Senator McGovern's conversion program. Surely, the nation has sufficient new priority needs to keep our technical work force employed at peak levels far into the future. Moreover, the present "Boom-and-Bust" status of many large arms and aerospace industries should provide incentive for technical and scientific workers to welcome increased job opportunities in secure civilian areas.

Senator McGovern's comprehensive and innovative proposals will increase job opportunity and security by transferring much needed skills and expertise to the domestic needs that the present Administration has left unmet—mass transportation, housing, advanced health care, air traffic and guidance control, and pollution abatement, to list only a few. Scientists for McGovern, a volunteer organization of scientists and engineers, as well as other advisory groups, is actively working on providing Senator McGovern with analyses of the areas of science applications that are related to technical manpower.

Through a foresighted set of policies, the number of technical and scientific jobs can increase, rather than decrease, as many technical workers fear. Through increased civilian research and development and increased commercial productivity America can attain full employment while breaking away from our lamentable dependence on massive, wasteful military spending.

S. E. LURIA

Department of Biology, Massachusetts Institute of Technology, Cambridge 02139

IQ: Methodological and Other Issues

In the United States, the average IQ of blacks is 85 rather than 100. A number of investigators—most notably Jensen and Eysenck, on whose writings Scarr-Salapatek comments in her book review ("Unknowns in the IQ equation," 17 Dec. 1971, p. 1223), and Scarr-Salapatek herself ("Race, social class, and IQ," 24 Dec. 1971, p. 1285)—have attempted to determine the degree to which this discrepancy is due to (i) genetic differences between blacks and whites or (ii) the racist nature of U.S. society. The degree of genetic contribution cannot be determined directly by methods based on assuming a nonsystematic relationship between genes and environment, or on sorting out genetic and environmental influences within groups, because it is clear that racial discrimination in the United States has led to a confounding of black genes with an environment not conducive to intellectual development. In Scarr-Salapatek's words (p. 1287),

> If all black children are disadvantaged to an unknown degree by being reared as blacks in a white-dominated society, and no white children are so disadvantaged, it is impossible to estimate genetic and environmental variances between the races.

and (p. 1226),

> Direct comparisons of estimated within-group heritabilities and the calculation of between-group heritabilities require assumptions [about environmental effects] that few investigators are willing to make. . . .

Instead, in her book review she proposes some "indirect approaches" [*see next letter*]; and her own study describes still another way of exploring the source of racial differences in IQ—a method based on comparing correlation coefficients. The purpose of this letter is both to raise a question about specific findings in her study and to point out a common problem with studies based on the comparison of correlation coefficients.

Scarr-Salapatek derives estimates of the heritability of IQ in blacks and in whites, in upper and lower classes, on the basis of the degree to which the correlation of IQ between same-sex twins differs from that between opposite-sex twins, and examines whether the results are better predicted by an "environmental-disadvantage" model or a "genetic-differences" model (p. 1287):

> To the extent that the *same* environmental factors are assumed to affect the development of IQ in the same way in both black and white populations, predictions can be made about the sources of racial differences in mean IQ scores. If certain biological deprivations (such as low weight at birth, poor nutrition) are known to be more prevalent in lower class groups of both populations and more prevalent among blacks than whites, then the two models can make differential predictions about the effects of these sources of environmental variance on the proportion of genetic variance in each population. Given a larger proportion of disadvantaged children within the black group, the environmental disadvantage hypothesis must predict smaller proportions of genetic variance to account for differences in phenotypic IQ among blacks than among whites, as whole populations. Since the genotype distribution hypothesis predicts no differences in the proportion of genetic variance for social class groups within the races, it should predict the same proportions of genetic variance in the two races.

She appears to interpret her findings as supportive of a smaller proportion of genetic variance among blacks than among whites. But the proportions she obtains are highly questionable.

Twelve heritabilities are evaluated. Each combination of test (verbal, nonverbal, and total) by race (black, white), by social class (below median, and middle and above median) yields an estimate of heritability based on the difference between the correlation between same-sex twins and that between opposite-sex twins. Yet in 5 of the 12 instances heritability "cannot be estimated"—because the correlation between the IQ's of opposite-sex twins is higher than that between same-sex twins! If genetic disposition determines phenotypic intelligence to *any* extent, opposite-sex twins—all of whom are dizygotic—simply cannot have more similar IQ's than do same-sex twins, some of whom are monozygotic. The finding that in virtually half the contexts studied there is a higher correlation between opposite-sex twins sheds severe doubt on the degree to which the correlations that Scarr-Salapatek computes are representative of the population from which she sampled. Since the sample values do not perfectly reflect the population values of the correlation coefficients, statistical tests to determine the significance of the differences between the correlations would be desirable. (Testing the differences between the correlations for the same-sex twins and for the opposite-sex twins by a method proposed by Fisher (*1*) reveals that there are no significant differences; however, this does not test differ-