

IS QUALITY OF U. S. POPULATION DECLINING?

Interview With a Nobel Prize-Winning Scientist

As America's crime and relief rates soar, these questions are being asked:

Is society really to blame for the criminal and the shiftless loafer? Or are they that way because of some hereditary defect?

Are such people multiplying faster than able and law-abiding Americans?

In this interview by members of the staff of "U. S. News & World Report," a noted scientist, Dr. William Shockley, urges all-out inquiry into heredity's role in the build-up of U. S. social problems. He finds some fellow scientists sharing his worries—and others unwilling to delve into a "delicate" issue of growing concern.

Q Dr. Shockley, is the quality of the human race declining in this country, or elsewhere in the world?

A We have reasons to worry about that possibility, and I have found that many other thinking people are worrying seriously about it.

In fact, I understand there are people in our Government who feel that this whole question should be studied extensively and vigorously to get at the facts. But it's also my conviction that nothing of adequate vigor is being done now.

Q Why do you say that this whole subject needs more study?

A Last year Secretary of Labor Willard Wirtz made a statement to the effect that there were strong indications that a disproportionate number of our unemployed come from exceptionally large families. Now, I interpret this to suggest that a child of an exceptionally large family is less likely to be able to hold a job.

Then Secretary Wirtz went on to say:

"But we"—meaning the Government and the nation—"do not pursue evidence that would permit establishing this as a fact or evaluating its significance."

Secretary Wirtz wrote me that he hoped his statement would encourage others to ferret out the facts.

In other words, we're not finding out *if* this is true. We're not finding out what it means if it *is* true. But my great worry is that, if adequate research along this line were carried out, we might find that there is a strong genetic factor at work, and that heredity very much limits the improvement we can expect in such cases.

What I am suggesting is that, even if we overcome currently limiting factors—like accidental brain damage during pregnancy or at birth, and unfavorable environments—we may find that a dismal possibility turns out to be a fact: Many of the large improvident families with social problems simply have constitutional deficiencies in those parts of the brain which enable a person to plan and carry out plans. And I also suggest that this characteristic, especially if found in both parents, can be passed from one generation to another.

But when I try to pin professional geneticists down on this point, the reaction is often: "We don't really know any-

thing about this, and you shouldn't raise these possibilities." This withdrawn attitude does not fit my idea that progress is made by open-minded exploration.

Q Isn't it now the tendency to blame such attributes on environment—to say that a boy becomes delinquent because he lives in the slums?

A This is an assumption which many persons prefer to believe, and no doubt has some justification. On the other hand, there are some very definite things we know about the great variety of human brain cells and the enormous complexity of their organization. These things give us no reason to think that the distribution of these cells is not genetically determined.

It is my conjecture that people could have an inherited deficiency in frontal-lobe organization or other brain structure so that they act somewhat like patients with frontal lobotomies [in which nerve fibers in the brain are cut]. I would expect people like this to find difficulties in planning for careers or families. This is another area in which more-active research could be stimulated.

Q Do such people tend to produce more children than persons of average or superior ability?

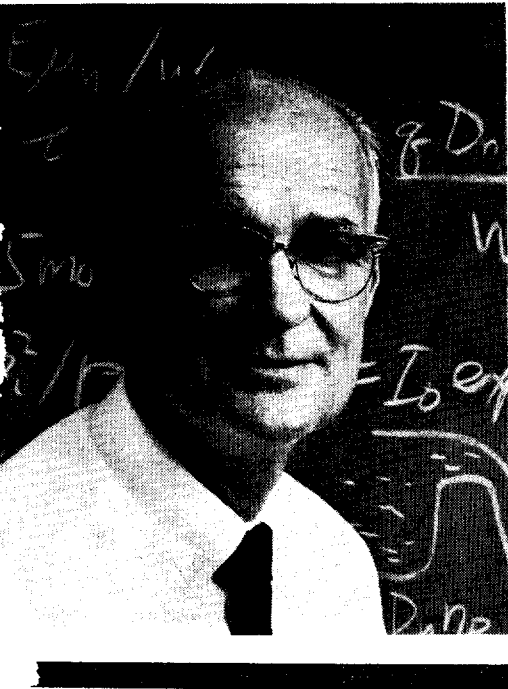
A That is my basic worry, and it was driven home to me by a specific instance in San Francisco where the proprietor of a delicatessen was blinded by a hired acid-thrower. Who was the acid-thrower? He was a teen-ager, one of 17 illegitimate children of an improvident, irresponsible woman with an I.Q. of 55 who could remember the names of only nine of her children.

The probable father died in prison, sentenced for murder. If that woman can produce 17 children in our society, none of whom will be eliminated by survival of the fittest, she and others like her will be multiplying at an enormously faster rate than more intelligent people do.

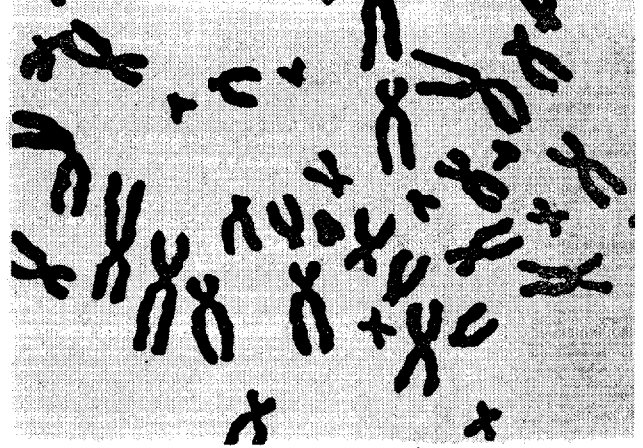
Is she an isolated statistic? Who knows? For myself, I fear it is not an isolated statistic.

I can see how, if this sort of thing can occur at all in our society, it could snowball so that the fraction of our population composed of such people could double in less than 20 years and outnumber all the others in a few centuries.

Obviously, any substantial percentage of people like this



Dr. William Shockley, 55, is a co-winner of the Nobel Prize for physics in 1956. Since then, he has become involved increasingly in study of the world's population problems. Now the Alexander M. Poniatoff professor of engineering science at Stanford University, he received much notice earlier this year when he and several other Nobel Prize winners spoke at a symposium that was sponsored by Gustavus Adolphus College on "Genetics and the Future of Man."



—NIH Photo

Inside each cell, chromosomes and their genes transmit hereditary traits. When "adverse things take place genetically," says Dr. Shockley, families deteriorate.



could produce enormous social instability. There are some who deny these dangers on genetic and statistical grounds. But I have little confidence in the objectivity of their reasoning or the reliability of their optimism.

Q Just what is known about the relative importance of heredity and environment in such cases?

A Not nearly enough, but let me mention one item that seems to me quite telling. It comes from an article in "Science" not quite two years ago, collating the data on studies of intelligence quotients of identical twins, who, as you may know, are genetically identical.

Now, broadly, the conclusions were these:

If you had identical twins who were separated at birth and raised in different places, and you measured their I.Q.'s when they grew up, you would find much less difference between them than you would find between ordinary brothers and sisters who are genetically different but who are raised in the same environment. This small sample, about 100 individuals, impresses me enormously with the dominant importance of heredity on the individual's intelligence.

Really reliable facts along these lines could be obtained if the Government or some foundation sponsored a "controlled" program of adoption of abandoned infants to study the effect of differing environments on them.

Q A few moments ago you mentioned "survival of the fittest." Has that been pretty well removed as a controlling factor in the quality of the human race?

A I think so, at least in America. We live in such an abundant welfare state that the forces which, in the past, led to the evolution and development of man are playing a little role.

Maybe in some of the worst slums of great cities of the world, survival of the fittest is present. I don't know. If so, it may well be that some of the most effective improvements in the human race are occurring in the most dismal, unattractive areas of the world.

Q Does it follow that an affluent society like that in America may be most in danger of producing deteriorating human beings?

A I fear this is likely to be true. Proof, of course, does not exist, but the fact remains that our competitive system has

brought us the highest standard of living of any place in the world.

We're living in a society in which the achievements of the human mind have made it possible for people to survive with the help of machines and technology and welfare. Therefore, adverse things may take place genetically, and the unfit may increase faster in our population than ever was true in the past.

Q Just how much faster are people of inferior ability breeding than those of higher ability?

A As far as substantially retarded persons are concerned, there have been studies showing very little breeding. They simply don't succeed in finding mates. Furthermore, many of the cases are not hereditary but result from lack of proper prenatal care.

The real cause of worry is people of somewhat higher ability but still, say, near the bottom of the population in ability to learn to reason and to plan ahead—vigorous, capable of mingling with the general population, and not considered "defective" on casual appraisal. Not only are they dull but they need help to survive. Most cannot advance and some are a threat to other people.

One frightening possibility is that our humanitarian relief programs may be exerting a negative influence. These fears are supported by views like those quoted recently by the Associated Press: "I know a 16-year-old girl who was raised on relief. Now she has three illegitimate children and they are all being raised on relief." So far as I can find out, no Government agency is looking into the genetic aspects of this sort of thing.

Nor, of course, is there any discussion of what all-around benefits could come from more democratic contraceptive and abortion practices. Our present abortion customs insure the birth of the unwanted child of a poor girl who has made a

. . . "People hate to feel they are subject to laws of nature"

sexual blunder, while permitting the rich—who at least could provide a better environment—to cancel a mistake. This makes no sense to me.

And we know about the families that are mired down in all kinds of problems they can't solve—crime, poverty, delinquency, disease—from one generation to the next. Census Bureau studies have shown a high degree of inheritance in educational poor performance. Will all of these misfortunes be eliminated with increasing standards of living, or do we have a situation that is being perpetuated genetically and growing out of proportion? That is a very nasty question, indeed, and it is not getting an objective study.

HEREDITY AND CRIME—

Q To what extent may heredity be responsible for the high incidence of Negroes on crime and relief rolls?

A This is a difficult question to answer. Crime seems to be mildly hereditary, but there is a strong environmental factor. Economic incompetence and lack of motivation are due to complex causes. We lack proper scientific investigations, possibly because nobody wants to raise the question for fear of being called a racist. I know of one man who is writing a book in this area, and I'm not sure he'll finish it because the subject is so touchy.

But let me say what I find in my own reading:

If you take the distribution of I.Q.'s of Negroes, and compare it with that of whites, you are going to find plenty of Negroes who are superior to plenty of whites.

But, if you look at the median Negro I.Q., it almost always turns out not to be as good as that of the median white I.Q. At least, this is so in the U. S. How much of this is genetic in origin? How much is environmental? And which precise environmental factors are to blame? Again, a "controlled" program of adoptions might give answers.

Actually, what I worry about with whites and Negroes alike is this: Is there an imbalance in the reproduction of inferior and superior strains? Does the reproduction tend to be most heavy among those we would least like to employ—the ones who would do least well in school? There are eminent Negroes whom we are proud of in every way, but are they the ones who come from and have large families? What is happening to the total numbers? This we do not know.

Q Is the possibility of genetic decline a new kind of worry for the human race?

A Not as an idea—the idea is old—but as a coming reality, yes. You see, with improvements of technology—especially in nations of the West—you have had declining death rates, so that inferior strains have increased chances for survival and reproduction at the same time that birth control has tended to reduce family size among the superior elements. Warnings about this were heard 100 years ago, but it is still as touchy a subject today as it was then.

Q Why is that?

A Oh, a deep, psychological reason, I think. People hate to feel that they are subject to the same laws of nature as "things" or "animals." It is unnerving to them. Furthermore, it runs counter to so much of our social doctrine—the belief that the poor are victims of hard luck and poor environment, and that all can be changed by giving them a helping hand and a change of environment.

Q There are laws for sterilization of the unfit—

A Various States have these laws, but the degree to which they are effective is not well known, and they may not be well formulated in terms of what might be known about human genetics.

In California, I did learn from a very humanitarian and well-informed physician that the rate of such sterilization had been quite significant when he was a young doctor. I did some telephoning and found the rate had dropped by something like 10 times during the last decade.

But the whole subject is being swept under the rug, so we have no real facts on the situation.

I am told Denmark has a sterilization system and there are reports and evaluations. I have not checked into this, but I know that this is a serious undertaking.

Q Would there be a strong feeling against strengthening laws of this kind?

A Well, I would hope that a great deal could be done through education and persuasion, and I think that the steps that are being taken in some of our cities to liberalize the dissemination of information on birth control, or liberalize abortion laws, are a great thing.

Q What about the majority of uneducated people? Would they co-operate?

A I once argued with Gregory Pincus, the father of the birth-control "pill," that improvident people would not avail themselves of birth-control methods nearly as much as they should. Pincus told me that, in fact, uneducated and impoverished women were the most assiduous users of the pill. They had less unexpected pregnancies than college graduates.

I can't remember being more encouraged by losing an argument! Still, in this area of human affairs, no universal and sweeping answers are likely to be available, so we're going to have to try many things that might add up to worthwhile results.

"WE WANT MORE LINCOLNS"—

Q Mightn't restrictions in breeding by the poor deprive us of an Abraham Lincoln in the future? Didn't he come out of an unpromising background?

A Poor people can be quite gifted. Restrictions should be placed on the basis of sound genetics without regard to income, class, race, religion or national origin. The breeding of good genetic material, whether the people are rich or poor, is desirable. We want more Lincolns, not fewer.

Q How sure can we be that this is going to happen?

A If a man is exceptionally superior to his family background, a lucky combination of genes passed on by his parents is responsible. How much of this luck he will pass on is uncertain. Where both parents are of superior quality the element of luck is reduced.

Luck in genetics can't be eliminated entirely, of course—which is why, even in a family of exceptional children, you will find the average or even retarded child occasionally—just as in a family of average or dull children you will find the brilliant exception.

Much of this is a matter of statistics and probabilities. But we also need research to gain better insight into the various genetic mechanisms. The more we all know, the wiser our population policies can become.

Q Don't children of superior ability sometimes turn out badly?

A There is a common misconception that brilliant youngsters are likely to make a mess of their lives. Well, it happens that many years ago there was a study at Stanford University of gifted children, and a follow-up on what happened to them afterward. This study showed that these children, on any basis of comparison with the rest of the population, did very well. Fewer became alcoholics, they

... "A nuclear war might inflict much genetic damage"

earned more money than the average person, fewer entered mental hospitals, fewer had divorces, fewer went to jail.

Q How long do you think it will be before steps to improve the quality of the human race will become accepted on a wide scale?

A General acceptance may be quite a way off, but maybe not so far off as we now think. I suspect that, if a study were made and we found out that the acid-throwing teenager represented a hereditary class which is now doubling its members in less than half the time of the rest of the population, we would soon start looking for solutions. Why? Because it would clearly be a matter of life or death for our nation.

Q What do you think could be done in this country as a start on this whole problem?

A First of all, we must have more study, and more objective study, of all the questions you've raised: Are the less able people really multiplying faster? Are there significant genetic differences in the ability of various human groups? To what degree is environment responsible for our "problem" families, and what environmental factors are involved, and how? How successful are the programs we have in advancing such problem families? Are we developing methods of evaluating the significance of their effects?

That's No. 1: a national research effort, thorough and open-minded—an objective, fact-finding approach.

Then, I think we need to improve our science education—with emphasis on the existence of objective reality and the power of rational reasoning. Our science teaching in public schools doesn't seem to be driving home adequately the point that reasoning can sometimes be applied to deal with very difficult and nebulous problems and, when it can, it is man's most powerful tool for thinking.

Q Is it education, broadly, that is going to be our likeliest solution to the problem—if there is a problem?

A I would say so. Certainly the public needs to be stirred up to think about this whole question objectively. That's what I'm trying to do in this interview. It is ridiculous that some States have laws against teaching evolution.

Several eminent intellectuals have discouraged me from publicly expressing the ideas we have talked about. They feel the uninformed and prejudiced might react badly. But I have faith in the long-term values of open discussion.

Q As more and more youngsters go to college and marry fellow students, will that have some effect on the genetic balance?

A Yes, I would think that things will tend to move in that direction. In a modern society with high mobility, inbreeding is reduced to the minimum.

INCENTIVES FOR EDUCATION—

Q Could some incentive be offered to such couples to have more children?

A I know of no really good answer to this important problem, but let me discuss one provocative possibility:

Ernst Mayr, a zoologist at Harvard, has proposed making tax exemptions for children proportionate to total income of parents, rather than setting a fixed sum of \$600 as at present. In other words, a family with an income of \$15,000 a year would get a much larger exemption than a family making \$5,000 a year.

Along the same lines, he proposes that allowances be given for educational costs that tend to be higher for parents of superior ability who want to give their youngsters a superior education.

This might work out well on the average by encouraging families that have shown above-average accomplishment to have more children and offset the situation where a woman of low intelligence can raise her income with each illegitimate child. Ideas like Mayr's need more public discussion.

Q Can a society becoming more and more technological afford to continue having large numbers of defective and dull people in its population?

A Certainly not. There will be less and less work that such people can do, and less and less that they will be able to comprehend in the world around them.

Q They can be looked after by public welfare—

A It's perfectly true that an affluent society can look after such people through charity, but I don't like it, and I don't like the common and dangerous notion that we don't have to worry about defective people whom science can "patch up" somehow.

Perhaps you can find employment even for the low I.Q.'s. But how is our democracy going to work if a large fraction of the electorate must be supported by the community and also lacks the brains and moral sense needed for good citizenship?

The more people we produce who are capable of higher education and are freer of defects, the more of our energy we can devote to the improvement of our environment. The more people we produce who are incapable of voting intelligently, the greater the risk of economic trouble and war.

But these are my personal reactions. What I worry about most is that there is so little discussion of these matters that no worthwhile consensus is having a chance to develop.

OUTLOOK: "I'M HOPEFUL"—

Q How do you feel generally about the prospects of an improvement taking place in the quality of the human race?

A On the whole, I'm hopeful. You remember that about 10 years ago people were saying that Malthus in his 1798 prediction had overplayed the dangers of population growth. President Eisenhower said that population control wasn't something the Government should concern itself with.

Now we find that Mr. Eisenhower changed his mind. And President Johnson is saying, in effect, that \$5 spent on population control would be worth \$100 spent on economic development.

In the broad field of population control, there has been an almost complete reversal in attitudes—and this, with the development of the intrauterine loop and other devices, suggests that the human race can solve the problem of growing populations.

This suggests to me that people will find sensible ways to solve the problem of the quality of the human race.

But there is another very grim possibility: A nuclear war might inflict so much genetic damage that it would become absolutely necessary to select from the survivors those persons with sufficiently undamaged genes to perpetuate a healthy human race. This would clearly require society to make complex eugenic decisions. I hope this task never will confront us, but this is one way in which the human race might be forced to resume its evolution.

I think our best chance for progress in human evolution without the eventual dismal detour of nuclear genetic damage is in more stress on research and public discussion.

My program for continued progress is: Let's ask the questions, do the necessary research, get the facts, discuss them widely—then either worries will evaporate, or plans for action will develop.

[END]