thousands of miles. Both radar systems consist of phased arrays of antennae mounted on the exterior walls of concrete bunkers several hundreds of feet in their dimensions above ground. For practical purposes, the long range radars will control the flight of the long-range Spartan missiles, the first of which are to be tested in action (against dummy ICBMs) this summer. The shorter-range radars will control the Sprint missiles, designed for the rapid acceleration necessary if comparatively local interception is to be successful. What seems now to have been established by those critics of the system who say that Safeguard will not function well is that the shorter range radars may be saturated by a sufficiently coordinated enemy attack or by the use of multiple warheads or even dummy warheads. What Senator Brookes was arguing last week was the need to supply this extra equipment so as to make sure that some at least of the Minuteman sites are properly defended. His case was defeated fifty-three to forty-five.

AGRICULTURAL GENETICS

Corn Blight hits Male Sterility

THE corn blight which has already damaged crops in the southern states in the past few weeks has now reached Iowa and other states in the mid-West corn belt, throwing the commodities market into confusion and causing consternation as far away as Washington. Until the growing season is over, some weeks from now, it will be hard to tell whether the yield of corn—maize to many people outside the United States—will be reduced by the five per cent or so which the more cheerful agronomists are talking about, or whether a quarter of the crop will then be found to have disappeared. In Chicago, the commodity markets have already responded by increasing the price of corn by something like 20 per cent. An Australian entomologist, back last week from Iowa, takes the more gloomy view, saying that "they should have seen this coming all along".

The fungus responsible for the blight, *Helminthosporium maydis*, has been known in the southern states for the best part of a century. In the past twenty years, however, its effects have been kept in check by the development of resistant varieties of corn. What may now have gone wrong is that the male-sterile varieties of corn now widely planted in the United States have, by their genetic stability, provided an especially vulnerable target for a recent mutation of the fungus. If reports that the male-sterile varieties are now suffering most severely from the blight should be confirmed in the next few days, the plant breeders who have recently been boasting of the virtues of male-sterile varieties may find themselves pilloried, not praised.

Corn plants are bisexual, with the male reproductive organs carried on tassel-like appendages. In what have become the old days, farmers would attempt to ensure cross-pollination of corn plants by removing the male appendages from alternate rows of corn plants—a costly procedure. With the emergence in the past few years of varieties with improved yield and disease resistance, there was also a natural welcome from the emergence of a strain of corn from the plants of which the male reproductive organs would be discarded before maturity, and this is now the most commonly planted variety of corn in the United States. For a time, at least, the lack of cross-pollination and the genetic stability which was the natural result seemed to be a great advantage. The same genetic uniformity may now, however, account for the vulnerability of the corn crop in the Middle West and the South. Certainly the fungus, first noticed in its new form only a year ago in Illinois, has spread like wildfire. For the plant breeders, the problem is what to plant next year. Corn farmers may yet find themselves detasselling their plants.

DEMOGRAPHY

Population Explosion Falls Flat

THE falling trend of the birth rate during the sixties has now prompted the Census Bureau of the Department of Commerce to publish new estimates of the population of the United States in the decades ahead. On present trends, the population in the year 2000 is estimated to be 281 million, or a little less than the lower bound for the year 2000 put out as recently as 1967 by the Census Bureau. These substantial fluctuations of the official estimates are not so much a sign of poor arithmetic at the Census Bureau but of the inherent difficulty of estimating the fertility rate of women, both as the gross figure for the average number of children per woman in the population and as a function of the age of the child-bearing population.

As in the past, the Census Bureau has carried out forward projections for each of several assumptions about the fertility rate for women ranging from 3·35 children per woman (for women not yet of child-bearing age) to 2·45 children per woman. The fertility of American women in the sixties appears to be close to the lower of these limits. The new projects also include a forward projection based on the assumption that the completed fertility rate of American women works out at 2·11 children per woman, the ratio necessary to maintain the population at a constant level (which would amount to a population of 276 million in the year 2035 and thereafter). Each of the assumptions about gross fertility rate is accompanied by a different set of assumptions about the timing of births and for practical purposes it is assumed that decreased fertility is accompanied by later child-bearing. The unexpected character of the present low fertility in the United States is confirmed by the way in which it has been necessary for the Census Bureau to go back to the Great Depression for information about the timing of births in periods of low fertility, a somewhat hazardous procedure. It has also been necessary to make assumptions about the rate of immigration, and the Census Bureau has settled either for a conservative 400,000 souls a year or, in its attempt to estimate the pattern of a stable population, for none at all.

With these assumptions, the upper and lower bounds of the population twenty years from now are put at 277 million and 255 million respectively, compared with the 203 million now estimated for the population of the United States. If the fertility of the population should however fall merely to the replacement level and if immigration is brought to a halt, the population of the United States in 1990 will be 248 million—a comparatively small reduction from the lower bound corresponding to the present level of fertility. The