
# Our Frontiers Lie Now in Technology

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**FOR A GREAT MANY YEARS** one of the standard characters of folklore was the young man leaving the country for a job in the city. History shows that in colonial times 90% of our people lived in rural areas—there were, in fact, only 24 communities qualifying as urban, of which only two had more than 25,000 people. Today we have 3000 cities and towns, nearly a hundred with more than 100,000 people each, and over 60% of our total population lives in these urban locations.

It was, of course, the gradual improvement in productivity of the farm and the farm worker that made it possible for the cities to grow, because city populations can be supported and sustained only to the extent that the farmer can produce beyond his own immediate needs. But with mechanization, farm chemicals, and better methods, agricultural progress in this country has been spectacular. In this century we have seen a 45% reduction in the amount of land required to feed one person and a decline of some 70% in the number of farm workers required to keep our population well fed. Thus, more and more people have been released from agriculture for other pursuits.

The wealth of nations for centuries was determined by the fertility of their soil and the value of such natural treasures as could be found upon the land. Discovery of the North American Continent came at a time when the world's traditional resources were sorely strained. As an example, in one 70-year lifetime in that period England alone, the most advanced European country, suffered through four famines.

But today the old frontier in the geographical sense has virtually disappeared. The last of the "free land" was homesteaded long ago, and such public lands as remain are leased for specific use or are in park or forest reserves. Some pessimistic observers seem to view this with dismay and make much of the fact that no frontiers remain to challenge the enterprise and the initiative of the people.

They are, of course, wrong. More land is not the whole answer to a higher standard of living, and a frontier based simply on more-land-per-capita could not in itself account for this striking advance.

American technology has made it possible for the land to produce on every acre a quantity of food exceeding many times the output of a century ago. It multiplies human effort in remarkable ways—it has been estimated that one chemical worker making 2,4-D weed killer, for example, is about equal to 800 farm workers chopping weeds with the hoe. In this country, through our expanding technology, we have increased our agricultural production by 25% in the last 10 years alone, as against a population increase of only 12%. This gain represents a quantity of food and other agricultural products equal to an increase of nearly 100 million acres of crop land, roughly the entire area of the great state of California.

Technology is the leverage which we can apply to improve individual output per unit of effort. Archimedes once remarked that if he had a lever long enough he could move the world. In technology we have a lever that is moving the world every day, lifting it toward new heights of utility and abundance. It is helping to lift us also toward new goals in the field of the humanities; toward new standards of educational and cultural well-being. As we approach a solution to the ancient problems of hunger and crushing toil, we move in the direction of this noblest human achievement.

*(Excerpts from a speech before the Chamber of Commerce, Kinston, N. C., Oct. 1, 1953)*