At 90, Dr. Norman Borlaug: A Giant of Our Time

By ACSH Staff — May 7, 2020

Given that PBS, in its recent documentary, “The Man Who Tried to Feed the World,” found it necessary to disparage Nobel Laureate Dr. Norman Borlaug, we believe it is important for our readers, and the world, to know what a thoughtful and truly benevolent man he actually was. Here is an article about Dr. Borlaug, a co-founder of the American Council on Science and Health, that we published on March 22, 2004.

The greatest good is often that which is unnoticed and unknown. Not least among our blessings are the bad things that do not happen and are therefore invisible to us. The benefits of modern science and technology permeate every aspect of our lives but remain largely unnoticed, while the occasional problems of modern life get widely trumpeted, depicted as the norm rather than the exception. Various groups have an interest in keeping us worried about what allegedly harms us while they remain silent about what keeps us going day in and day out. Counting our blessings is too often saved for special occasions and taken for granted the rest of the time.

We cannot repeat too often the litany of how much longer we live than people did just a century ago, how few of our children die in infancy or early childhood now, and how much healthier and taller we are. Just as our benefits are often invisible, so, too often, are our benefactors.

To the extent that my experience as a professor is typical, and I am confident that it is, the vast
majority of young people in college are unaware of the diseases that have never afflicted them and the death or lifelong debility that others before them suffered and felt lucky to survive. At best, smallpox is something of which they are vaguely aware. By some estimates, prior to William Jenner's use of the cowpox vaccine to immunize against smallpox, one in every ten human beings that lived was infected by it.

**Century of Horror and Great Gains**

In the first eight decades of the century in which my students were born, the death toll from smallpox averaged more than 35 million per decade, totaling over 280 million, more than died in all the horrendous wars of the twentieth century. Given the rapid decline in smallpox deaths during the eleven-year eradication campaign, it is likely that lives saved from death from smallpox now exceed 100 million and counting. A far greater number survived smallpox in the old days, but the quality of their life was greatly diminished by the damage to their eyes or internal organs. Except for two people who died in a laboratory accident, no one has died from smallpox or even contracted it in over two and a half decades thanks to the eradication campaign that was led by Dr. D.A. Henderson, a member of ACSH's Board of Scientific Advisors. Henderson is now the leading expert on bioterrorism in the United States.

Possibly greatest among the twentieth century's unsung and largely unknown benefactors, though, is Dr. Norman Borlaug, whose ninetieth birthday we celebrate on Thursday, March 25th. Dr. Borlaug, a Nobel laureate and member of ACSH's Board of Directors was honored along with D.A. Henderson at ACSH's twenty-fifth-anniversary banquet last December.

Sixty years ago, Borlaug went to Mexico to begin his life work, which continues undiminished to the present. His task was nothing less than to create the seeds of plenty, the seeds that would feed a growing post-war population and reduce the strife and disruption, the disease and death that famine has too often brought to humankind. These were the seeds of the higher-yielding varieties (HYVs) of wheat that initiated what was later called the Green Revolution and which, along with the HYVs of rice, became known as the miracle grains and miracles they were.

**The Science of the Green Revolution**

The story of his breeding exploits, such as using the dwarfing gene of a variety of wheat known as Norin 10, and his many field trials have been told before and are worth repeating many times, but not here as I prefer to focus on the outcome. Not only was Borlaug charged to come up with higher-yielding varieties, but they also had to be disease-resistant, since a larger crop would be of little value if it was lost to disease. This Borlaug accomplished, and it is a lesser-known part of his achievement.

Out of Borlaug's work in Mexico came the first of the International Agricultural Research Centers (IARCs), Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT or International Maize and Wheat Improvement Center). Borlaug's achievement in increasing wheat yields inspired the founding of the International Rice Research Institute (IRRI) in Los Banos in the Philippines in 1960 and led later to a series of other research institutes that are today organized together as the Consultative Group on International Agricultural Research (CGIAR) and Future Harvest. In the 1940s and 50s, the prevailing wisdom was that research was not necessary; all the poor countries
needed was a transfer of developed countries' agricultural technologies to solve their food problem. Borlaug knew better and history has proved him right.

In winning the Nobel Peace Prize in 1970, Borlaug, in his modesty, viewed it as a collective honor for all those who worked to bring on the Green Revolution. To whatever extent it has been a collective endeavor, it was Borlaug who launched it and who has sustained it through the decades. And so it was to him that the Nobel Prize was awarded and was so richly deserved. No recipient has been more worthy.

In the 1960s and 1970s, the bad news bandits were in full throat, predicting uncontrolled population growth and famine of massive, unprecedented, and unimaginable proportions. Borlaug continued the work that proved the doomsday prophets wrong, though some are still around and hard at work, moving on to higher untruths, generating more erroneous projections, proclaiming their own virtue for doing so, and doing nothing to help feed the poor.

**Impact on the World**

One can date the beginning of the Green Revolution to the 1940s. For simplicity, we will use 1960 as a benchmark date. From 1960 to 2000, world population doubled from 3 billion to over 6 billion people, while the food supply increased 2.7 times, leading to a roughly 35% increase in per capita food supply. Once again, the number of favorable indicators of change are too many to enumerate except to say that without a revolution in food production, the other factors promoting positive change immunization, antibiotics, etc. simply would not have been able to confer significant benefit. As the adage states it: when one is adequately fed, one has many problems; when one does not have enough food, there is only one problem.

At the core of the Green Revolution was a grain revolution, with Borlaug's wheat providing roughly 23% of the world's calories. The increase in grain production required only a 4% increase in land under grain cultivation, while overall land cultivation saw only a 7% from 1.4 to 1.5 billion hectares. At 1960 yields, to achieve the grain increase alone would have required another 800 million hectares, which would have left us essentially without the rainforests and other lands set aside for wildlife. And this assumes that these lands would produce the same yields as the cultivated lands, which is highly unlikely. One can easily imagine a growing population, desperately seeking to feed itself, destroying the habitat that we so cherish today.

Having been privileged to go to Africa and then to Asia and the Caribbean in the early days of the Green Revolution, I see the statistics as much more than numbers. Each trip to Asia, no matter how frequently I went, manifested visible improvements in nutrition among the least privileged. In countries of Southeast and East Asia, where starving children once filled the streets, I saw adequately nourished children. I saw families walking together and could identify the age group of children by the school colors that they wore. It was fun to be there at times when younger children were regularly taller than their older siblings, indicating a dramatic improvement in both maternal and child nutrition. It doesn't take too many trips to Asia to notice the increasing average height of the population, an observation that can be massively documented.

Anyone who has gone to Vietnam or China in the last two decades can observe changes similar to those that occurred in earlier decades elsewhere in Asia. Going into the fields, working with and
talking to farmers, consistently brought the same stories of increased yields and fewer crop failures and a commitment to the Green Revolution technologies which many misguided activists in the West are now trying to "save" them from. In a word, Dr. Borlaug's work has had very deep personal meaning for me, which words cannot fully explain. In whatever we do, those of us who aspire to be development economists can only work with the tools given us by the scientists and technologists, and no one has provided more tools to do good than Norman Borlaug.

Contrary to popular mythology, the poor have benefited disproportionately from Borlaug's agricultural revolution. A moment's thought and the barest knowledge of economics would explain why. Thanks to the Green Revolution, the real price of food is half or less than it was in 1960, which means those who spend the highest portion of their income on food the urban and non-farm rural poor garner the most benefit from it. Imagine what would have happened to the price of food if we had population growth and no increases in yield. The poor would have likely starved. The children and possibly even the grandchildren of the subsistence farmer of 1960, who produced little if any surplus, now have more to eat (or can survive on a smaller plot of land), making the increase in yields almost entirely a net gain. At last they may have a little to sell and can work a day or two in the village to earn money for school fees and a few extras which were previously beyond their reach. (The handful of large farmers actually benefited the least, since their increase in yields were partially offset by the lower price for their product.)

Countering the Anti-Borlaugs

Unfortunately, we still live in a world in which no good deed goes unpunished. The greater the goodness of the deed, the greater the magnitude of misinformation about it. So let it be, in a perverse way, a kind of tribute to Dr. Borlaug that so much misinformation has been spread about the Green Revolution. The falsehoods about the Green Revolution have become so deeply entrenched in academic life that many people are unable to accept the factual refutation no matter how carefully it is presented. The perverse irony, if not immorality, of the critics is that most of them have never done anything to help feed those in need, yet they condemn those like Norman Borlaug who have. This dichotomy continues in the debate over agricultural biotechnology. Those who oppose biotech are not only making it difficult for poor farmers to improve their lives and those of their families but are consuming resources that could better be used for improving food production. They force the diversion of valuable research efforts and money to defending technology against spurious charges rather than advancing knowledge.

Elsewhere I have written extensively-documented refutations of each of these falsehoods. Therefore, here I will simply list the positives of the Green Revolution. Those who have not heard the falsehoods should be able to figure them out, since each of the following is a statement of fact refuting one of the charges.

1) As noted above, the poor have been the major beneficiaries of the Green Revolution.
2) Even as the population has grown, the absolute number of people in poverty and hunger has fallen, as has the proportion of the population, thanks in no small part to the Green Revolution.
3) The world's population is not only better fed in terms of basic caloric needs but also in basic nutritional needs. The increased yields of the Green Revolution grains have allowed for more land
to be devoted to other crops, diversifying diets and improving health. Consequently, there is less monoculture today than forty years ago, not more.

4) Since the "Green Revolution" crops developed at CIMMYT or IRRI were generally crossed with local varieties in the countries where they were planted, there are many areas where agricultural biodiversity has actually increased, while even in those areas where it may have decreased, the decrease is far less than activists would have us believe. In addition, biodiversity has been preserved because less new land has to be brought under cultivation. Further, the collection, storing, and distribution of seeds from the agriculture research stations has added to the distribution of biodiversity, while biotechnology offers new dimensions of biodiversity, previously unimaginable.

5) The Green Revolution grains are more efficient in water and fertilizer use and therefore require less per unit of output. Because of newly-created resistance genes or "gene stacking," the Green Revolution crops are more disease-resistant, requiring less pesticide per unit of output than would have been the case for conventional crops. Once again, biotechnology in forms like Bt corn offers new possibilities for breeding pest and disease resistance.

Not a Bad Start

It is hard to imagine a revolution the scale of the Green Revolution, with its political, economic, social, ecological, scientific, and technological dimensions, that doesn't have some adverse consequences. It is a true testament to Dr. Borlaug that every major criticism of the revolution can be massively refuted. He initiated the Green Revolution with what we now consider to be "conventional" breeding techniques but were cutting edge at the time. He has continued to develop his thinking with each new shift in scientific understanding and is now a strong supporter of biotechnology. And he is still traveling the globe helping those in most need to grow their food requirements.

One has the sneaking suspicion that when we humans return to the Moon or go on to Mars, Dr. Borlaug will be on board so that he can get food production up and running. In any case, I will be keeping this tribute article current so as to be able to use it again for his 100th birthday. Instead of considering him one of the greatest human beings of the twentieth century, maybe we ought to think in terms of one of the greatest of all time [Editor's note: That was the conclusion of skeptics/commentators/magicians Penn & Teller, who graciously recorded a video tribute for ACSH's twenty-fifth anniversary in which they called Borlaug the greatest human being who ever lived, as they had earlier dubbed him on an episode of their Showtime TV series]. Who else has fed more people and sought less credit for it?

HAPPY 90th BIRTHDAY, DR. NORMAN BORLAUG!

Though I have not consulted my fellow Board members nor the staff of ACSH, nevertheless I am confident that I speak for all of them when I say how very proud and honored we are, Dr. Borlaug, to serve with you on our Board. I was also honored to serve on U.S. AID's Research Advisory Committee with Dr. Henderson, who is also an ACSH Advisor and contributed a chapter to one of my earlier books.

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