

## Not a New, but Another Look at Sugar

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Here in our land of plenty three times a day we sit down to eat. Some of us even have time for coffee breaks in mid-morning and mid-afternoon. All of us see before us a marvelous storehouse of energy; yet seldom do we give it much thought. We eat it, use the energy and it goes forth into every facet of endeavor. This is our sugar.

It seems worthwhile, on occasion, to back off from our intense focus on our own particular job and look at the total picture. Most men need to feel a little important, significant and useful. Let's take not a *new* look but *another* look at the sugar bowl, envelope or cube.

The struggle for energy begins early in the life of man and early in his history. The club which extended the cave man's fist-power, the wheel, fire, combustion engines and atomic bombs all are parts of our struggle for more and more energy. But back of all these there must be human energy, and where does it come from? Obviously, from plants and animals which eat the plants. And where does the plant get its store of energy? From the endless power of the sun, captured by the green leaf. What plant do we use most to capture, store and preserve the sun's energy most efficiently? The sugar beet whose mysteries we find most intriguing and at whose shrine we come here to ponder and debate.

This elementary lesson in biology, so well known to us all, has other bits of charm which we are prone to forget. Our fossil fuels, oil, gas, coal and even uranium are finite in amounts. The vast stores of energy which they represent, accumulations of years almost unnumbered, still have limits. We mine and burn these stores in ever-increasing amounts. They have an end no matter how remote. They are depleted with each calorie used.

Not so our sun whose boundless energy the planet receives in its checkerboard of nights and days. We are profligate with it. We nurture it, capture it, transform it and store it for our use each day, each year in the art and science of agriculture. Thus with each harvest new annual wealth, never before seen by man comes into use in life as we know it. The sugar beet once lifted from the earth is man's first look at new energy from

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the sun. Once started on its way that is the end of it and no man will ever see it again. Instead he'll have its stored energy in bowl, in cube and in envelope. This is fuel for life.

In fact, this is a prime reason for saying that agriculture is basic. The production of new, annual wealth from the soil, sun and air gives man his sustenance and the nation economic strength from which to draw the military posture necessary to maintain our way of life. For every dollars worth of agricultural commodity produced, ten dollars in ancillary jobs are generated. These are the reasons why everyone has, or should have, an interest in agriculture. This is the reason we can feel, each of us, that our job is an important one. This is why we must give thought to our agriculture in which the production of sugar beets is a most important, basic business.

Every informed source readily admits a rapidly expanding population. Sugar consumption reflects it. We may have reached a plateau in our per capita consumption, but there are a lot more mouths to feed. It took from the beginning of recorded history to 1887 to populate the world with 1.3 billion people. In my lifetime, plus ten years, another billion were produced. There will be 4 billion more produced in the rest of the century. They all have to eat. We'll be fighting for standing room and sugar if we do not meet this challenge.

Individual farms grow fewer and larger, but the total land available for food production grows smaller in extent as the battle for standing room and playing room grows hotter. The youngster born today faces a world with three acres of tillable land per person. When he is 36 years old there will be less than half an acre of tillable land per person. Our current surpluses can vanish in seven months if ever we come to a sudden stop. This is a real and immediate challenge to every technologist and it is one of great urgency to you.

These large farms are faced with the need for increased efficiency. Capital with which to operate is concentrating in a few great sources. Spurred on by a price-cost squeeze automation is fast reducing labor's place in agriculture. In 1900 we used 37 percent of our work force in agriculture, but in 1960 less than 9 percent produced much more food. Even with our present rate of mechanical replacement there may be less than 100 days of work in a year's time for agricultural workers in the near future.

You are a part of a rapidly expanding technology. New approaches to biological problems are engendered by a new sophistication in research. The advent of new techniques in chemistry, physics, genetics, the whole sub-cellular approach to

the secrets of living things will make for rapid changes in biology and agriculture. The quest for two pounds of sugar where one is now will lead to rapid changes in hybridization, mechanization and chemicalization. It is from groups such as this that men expect to obtain the technical knowledge for survival in a crowded world. Let us hope that we may find a public policy which will understand the need and create a climate in which our studies may flourish rather than be stunted by emotional or political unrealities.

There can be no question of the need for changing legislation and regulation in a rapidly expanding, technological agriculture. The very fact that agriculture has a direct impact upon the health of the people, their economy and their social problems are proofs of its basicity in our society. To deal with the dynamic changes involved there will be many new laws, rules and regulations. It will require constant watchfulness on the part of those well informed about agricultural problems lest political expediency or opportunistic, bureaucratic empire builders delay our progress unnecessarily. This, too, is our task. The technical fields in which we spend our days will serve men better if each endeavor is motivated by an understanding of the socio-economic impact of our efforts.

If, as some leaders believe, the second half of our century belongs to biology as the first has to mathematics, physics and chemistry, then we have yet another task before us. There is currently a demand for 15,000 new young technologists in agriculture each year. We are producing about half that number. Each of us in his own circle should try to enthuse these brilliant youngsters with the desire to prepare themselves for opportunities in the fields of biology and agriculture. If we ourselves can be enthusiastic about our own work, we can better enlist the interest of fast on-coming geniuses. If we do not enlist them in the glamour of living things to study then other groups will and all mankind may suffer. It is not prudent to leave this job to counsellors less familiar with the field than we who are working in it.

The basic requirement in research is imagination. While this characteristic is not the exclusive property of the young, it is most abundantly evident in youth. True, it may need the guidance and control of more experienced heads but the fresh, imaginative attack upon our unsolved problems in agriculture needs tender loving care and encouragement. We can hardly hope to stimulate the enthusiasm of a youngster by regaling him with our own adversities and defeats. Their interest lies in the challenges and opportunities our studies disclose.

For each of us there must be some event which starts us on the road of formulating a philosophy for living. There was a young man to whom many doors were opened in late high school and early college. The personalities and enthusiasm (or lack of it) among his teachers confused and annoyed him. His lectures and his labs were motions necessary to conform and stay with the crowd. His efforts were kept at a minimum needed to "get by." By process of elimination and attrition along with getting nearer to the end of the road and his diploma, he began to feel that living things were of most interest.

One day, sitting before a fireplace where he had been many times before, he raised his eyes to read the words engraved in the mantle. He had seen these often, read them often, but never until this day did their full import reach him. They were "Ye forest logs fire back the glow of summer suns of long ago." The great oak logs glowed silently back at him with a new light. Here was warmth from the suns of history. Here was nature's storehouse for man's winter needs. Here was mystery, wealth, power and knowledge. It was all his.

When next you eat, and it will be soon, look lovingly at that most wonderful of nature's powerhouses, the sugar bowl. And when you take up the course of your discussions, do so with greatest self respect and enthusiasm because you are the men whose work supplies life's greatest fuel—sugar, new energy from the sun each year.

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