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MR. HOOVER'S TRIBUTE TO MR. EDISON[1]

THIS ceremony is a part of the celebration of Mr. Edison's invention of the electric lamp. It is also the dedication of the Edison Institute of Technology, the gift of Mr. Ford. Both are in fact national tributes to Mr. Edison.

The multiplication of the amount of light in the world a thousandfold is worthy of celebration, for darkness is a forbidding limitation upon righteous human activities.

When Mr. Edison invented the electric lamp he may perhaps have thought just to produce plain light and more of it at less cost. I surmise that his wildest ambition was to relieve the human race from the curse of always cleaning oil lamps, scrubbing up candle drips and everlastingly carrying one or the other of them about. He may have thought to add safety to Chicago against a second accident from an oil lamp.

But the electric lamp has found infinite variety of unexpected uses. It enables us to postpone our spectacles for a few years longer; it has made reading in bed infinitely more comfortable; by merely pushing a button we have introduced the element of surprise in dealing with burglars; the goblins that lived in dark corners and under the bed have now been driven to the outdoors; evil deeds which inhabit the dark have been driven back into the farthest retreats of the night; it enables the doctor to peer into the recesses of our insides; it substitutes for the hot-water bottle in aches and pains; it enables our cities and towns to clothe themselves in gaiety by night, no matter how sad their appearance may be by day.

And by all its multiple uses it has lengthened the hours of our active lives, decreased our fears, replaced the dark with good cheer, increased our safety, decreased our toil and enabled us to read the type in the telephone book. It has become the friend of man and child.

In making this, as in his other great inventions, Mr. Edison gave an outstanding illustration of the value of the modern method and system of invention, by which highly equipped, definitely organized labora-

[1] Address given at Dearborn, Michigan, on October 21.

tory research transforms the raw material of scientific knowledge into new tools for the hand of man.

In earlier times, mechanical invention had been the infrequent and haphazard product of genius in the woodshed. But science has become too sophisticated a being to be wooed in such surroundings. Nowadays a thousand applied science laboratories, supported by industries of our country, yearly produce a host of new inventions.

I can perhaps illustrate this modern method of invention. The fundamental natural laws of electricity were discovered three quarters of a century ago by Faraday, Hertz, Maxwell and other great investigators in the realms of pure physics and mathematics. Faraday discovered that energy could be transformed into electricity through induction—the theory of the electrical generator. It was one of the momentous discoveries of history.

It is related that Mr. Gladstone was induced to visit Faraday's laboratory to see this new scientific contraption. When Gladstone is said to have made the characteristic practical man's inquiry, "Will this ever be of use to mankind?" Faraday replied, "Some day you will collect taxes from it."

Mr. Edison, using organized systematic laboratory research, has been one of the great leaders who have converted the pure physics of electricity into a taxable product. To-day the governments of the world levy upon upward of $60,000,000,000 of new wealth founded upon electricity.

But the taxes and new wealth are not the major accomplishments of the men of this genus. These are the rivers of sweat saved from the backs of men and the infinite drudgery relieved from the hands of women.

I may emphasize that both scientific discovery and its practical application are the products of long and arduous research. Discovery and invention do not spring full-grown from the brains of men. The labor of a host of men, great laboratories, long, patient, scientific experiment build up the structure of knowledge, not stone by stone, but particle by particle. This adding of fact to fact some day brings forth a revolutionary discovery, an illuminating hypothesis, a great generalization or a practical invention.

Research both in pure science and in its application to the arts is one of the most potent impulses to progress. For it is organized research that gives daily improvement in machines and processes, in methods of agriculture, in the protection of health and in understanding. From these we gain constantly in better standards of living, more stability of employment, lessened toil, lengthened human life and decreased suffering. In the end our leisure expands, our interest in life enlarges, our vision stretches. There is more joy in life.

It is the increasing productivity of men's labor through the tools given us by science that shattered the gloomy prophecies of Malthus.

More than a century ago that great student held that increasing population would outrun the food supply and starvation was to be the inevitable executioner of the overcrowded earth.

But since his day we have seen the paradox of the growth of population far beyond anything of which he ever dreamed, coupled at the same time with constantly increasing standards of living and ever-increasing surplus of food. Malthus was right except for a new contestant in the race with his principle: That was more scientific research, more discovery. And that race is still on. If we would have our country improve its standards of living and at the same time accommodate itself to increasing population we must maintain on an even more liberal scale than ever before our great laboratories of both pure and applied science.

Our scientists and inventors are amongst our most priceless national possessions. There is no sum that the world could not afford to pay these men who have that originality of mind, that devotion and industry to carry scientific thought forward in steps and strides until it spreads to the comfort of every home; not by all the profits of all the banks in the world can we measure the contribution which these men make to our progress.

And they are the least interested in the monetary results. Their satisfactions are in their accomplishment—in the contribution of some atom of knowledge which will become part of the great mechanism of progress. Their discoveries are not the material for headlines. Their names are usually known but to a few. But the nation owes them a great honor and is proud to demonstrate through Mr. Edison to-day that their efforts are not unappreciated.

The country can well pay its tribute to the men of this genus by expanding the facilities for their labors. The nation to-day needs more support for research. It needs still more laboratories. To that Mr. Ford is making a generous contribution.

And in establishing this institute, Mr. Ford is doing honor to Mr. Edison in a manner which appeals to a sense of fitness—that is, by founding an institution dedicated to education and scientific research.

And scientific research means more than its practical results in increased living comfort. The future of our nation is not merely a question of the development of our industries, of reducing the cost of living, of multiplying our harvests or of larger leisure. We must constantly strengthen the fiber of national life by the inculcation of that veracity of thought which springs from the search for truth. From its

pursuit we shall discover the unfolding of beauty, we shall stimulate the aspiration for knowledge, we shall ever widen human understanding.

Mr. Edison has given a long life to such service. Every American owes a debt to him. It is not alone a debt for great benefactions he has brought to mankind, but also a debt for the honor he has brought to our country. Mr. Edison by his own genius and effort rose from modest beginnings to membership among the leaders of men. His life gives renewed confidence that our institutions hold open the door of opportunity to all those who would enter.

Our civilization is much like a garden. It is to be appraised by the quality of its blooms. In degree as we fertilize its soil with liberty, as we maintain diligence in cultivation and guardianship against destructive forces, do we then produce those blossoms, the fragrance of whose lives stimulates renewed endeavor, gives to us the courage to renewed effort and confidence of the future.

DR. WILLIAM BEAUMONT, AN APPRECIATION[1]

By WALTER R. STEINER, M.D.
HARTFORD, CONNECTICUT

IT is indeed a privilege to be able to come here to give some words of appreciation in memory of the physician whom you honor to-day—one who by his study of the physiology of digestion has been proved to be a pathfinder in our present knowledge of this subject. He has blazed a trail which has now become a broad highway, and it is greatly to his credit that he did so without any previous scientific training, for he was without college or medical school degrees or preliminary hospital experience. In spite of this, however, his name even now looms up large amongst the most distinguished men in our profession. In 1900 a monument was erected to him by the Upper Peninsular and Michigan State Medical Societies at Fort Mackinac where Beaumont performed his initial experiments upon digestion, but he did not obtain his proper honors until Osler told about him in an inimitable fashion "and brought him out of the obscurity into which we practical moderns had been allowing him to drift." Since then his manuscripts and papers have been presented by his family to Washington University at St. Louis, where, housed in a special room, they are well exhibited and permanently preserved. A boulder with a suitably inscribed bronze tablet was erected in 1926 by the Beaumont Club on the green in Lebanon, the town of his birth, and at the meeting of the Thirteenth International Congress of Physiologists in Boston his book, reprinted for that special occasion, was distributed to the members of the congress as representing our country's foremost contribution to physiology. Surely a prophet is not without honor even in his own country, despite the adage to the contrary, for to-day you are to dedicate a tablet to him here in this town where he conducted two of his four series of experiments.

[1] An address delivered at the unveiling of a tablet to Beaumont at Plattsburgh on August 24, 1929, upon the termination of the summer course in cardio-nephritis at the Physicians Hospital of Plattsburgh, New York.

Our knowledge of the digestive processes before his illuminating study was vague and unsatisfactory. Two views chiefly prevailed—the mechanical and the chemical. The former considered the grinding or pressing force of the muscular coats of the stomach as largely sufficient to accomplish the required and subsequently obtained digestion, while the second view explained the change taking place in the stomach as chiefly, if not wholly, of a chemical nature, resulting from the process of fermentation. Unable to solve the exact nature of digestion, which had stretched the pia mater of so many distinguished physicians, William Hunter, of London, finally remarked, in the century of Beaumont's birth: "Some physiologists will have it that the stomach is a mill, others that it is a fermenting vat, others again that it is a stew pan, but in my view of the matter, it is neither a mill, a fermenting vat, nor a stew pan but a stomach, gentlemen, a stomach."

Before the new era, however, which Beaumont was about to usher in, there were some honest seekers after the truth, and foremost among them we find Benjamin Richardson Young, of Hagerstown, Maryland, a young man like Beaumont and also an American. It had been long known that the gastric juice was acid in reaction, but it remained for Young to take the fundamental step in demonstrating its acidity and in proving its solvent, anti-putrefactive properties. This he did in a thesis which he presented at the University of Pennsylvania for the degree of M.D. in 1803. In the experiments there recorded he introduced a calculus into a frog's stomach and noted its gradual dissolution. He also put beans, peas, wheat and bread into a frog's stomach and found that in thirty hours the beans, peas and wheat were not acted upon, but the bread bag was empty. However, if the cereals were crushed they were readily digested. Vinous, acetous and putrefactive fermentations were then successively investigated with the re-