

American Life in the First Half of the Twentieth Century

In 1926, the distinguished journalist and author, Mark Sullivan, published a superb, two-volume account of US experience in the first quarter of this century. An excerpt from it follows. Sullivan thought that the moral or ethical side of this stage in America's journey didn't fit neatly into either category of "advance" or "decline." But in terms of science, technology, and other developments shaping the material side of the nation's life, 1900-1925 was a time of extraordinary progress. Sullivan's chronicle of these achievements is far-reaching and precise.

Then in 1939, the *New York Times* published a lengthy special section on the New York World's Fair, then underway. The *Times* saw the Fair presenting an appropriate occasion for national stock-taking, and enlisted a distinguished group of contributors. Among them: novelist and socialist intellectual, H.G. Wells; educators Nicholas Murray Butler and Robert Maynard Hutchins, presidents of Columbia University and the University of Chicago, respectively; Secretary of Agriculture, Henry Wallace, and Secretary of Labor, Frances Perkins; and business innovators Henry Ford, David Sarnoff, and Charles F. Kettering. Excerpts from Sarnoff's piece—he was President of the Radio Corporation of America—and Kettering's—Vice President for Research at General Motors—follow the Sullivan selection.

What's most striking in all these World's Fair articles is their unrestrained optimism about the present and future prospects of the American people. Faced with problems dwarfing those of our own day—the still-persisting Great Depression and the onset of World War II—the diverse group of authors the *Times* assembled celebrated national achievements and looked ahead with confidence.

The Enrichment of Man, By Mark Sullivan

From his book, *Our Times: The United States, 1900-1925, Volume I* (NY: Charles Scribner's Sons, 1936, first published 1926), pp. 59-67, 476-478, 491-493, 502-504.

[The] change in the relation of America as a nation to the rest of the world was only one of the undreamed changes that came to the United States and its people during the period 1900 to 1925. The elevation of America internationally was important, but it entered less into the daily life of the average man than some other advances during the same period—advances that came, not through political leaders, nor wars, nor the other agencies that constitute the materials of most histories, but from men of science and practical industry.

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The Extension of Life

[World War I], and all that accompanied it and resulted from it, was not the most important thing that happened during this period, except as respects international relations. Undoubtedly the war was a supreme adventure to the millions who went to fight, and had a profound influence on the other millions who remained at home. But even measured by the yardstick of human life, the losses occasioned by the war were far outbalanced by the salvaging of life effected by new discoveries of medical science

and the application of new principles in sanitation. Due chiefly to medical progress between 1900 and 1925, man was enriched in the thing he prizes most—his security of tenure on life, his defense against disease and death. The average age of the people who died in 1900 was forty-nine years; of those who died in 1925, fifty-five years. A dozen Great Wars could not counteract the beneficence of this progress. The Great War thrust upon us world leadership, economic, financial, and, to the extent that we accepted it, political; but this elevation had little concrete effect on the life of the individual, compared with the blessings showered on him by medical science.

At the beginning of 1900 it had not yet been proved that yellow fever is transmitted by a mosquito, typhus by a louse, bubonic plague by a flea. Gorgas had not yet demonstrated that mosquitoes may be eliminated from any portion of the earth's surface, and man's only weapon against malaria was quinine. Neither these facts nor the fundamental fact underlying them was known; and these plagues were as

Everyday Life

uncontrollable, except by the expedient of isolation, as they had been since the beginning of history. It was not known that typhoid and cholera come from germs in unclean water and milk; these diseases were still the scourges they always had been. Insulin for diabetes, vaccination against typhoid, emetin for dysentery, adrenaline—all were still unknown. Antitoxin for diphtheria and the X-ray were only just coming into use. Ehrlich had not yet made those 606 patient experiments that resulted in the remedy for syphilis. Radium had not yet been used in the treatment of cancer. All these and many other advances in medicine, surgery, and sanitation came between 1900 and 1925. They effected a six years' postponement of death, and that was but one enrichment among many.

Enrichment in Many Spheres

Man was enriched in the outward reach of his senses. It is true by 1900 the telephone had been developed to a point where one man could talk to another over 1400 miles of space, from New York to Omaha. That was already a marvel. But in 1900 men still under middle age could remember the time when the farthest distance one man could throw his voice was limited to what a good pair of lungs could do in a favoring wind, hands cupped megaphone-like, and "a whoop or a holler." In 1921, when President Harding delivered his speech at the burial of the unknown soldier, the distance his voice could carry was multiplied by the De Forest tube 3,000,000,000,000,000,000,000,000,000 times; by 1925 the radio made the human voice audible half-way around the world.

Man was similarly enriched in the outward reach of his sight, or in the number of things that were brought within his vision, and the facility with which they were brought, by increases in the capacity of the telescope, through which more of the universe was brought within his understanding; by increased power of the microscope, through which man's knowledge of the minute forms of

life was multiplied; by the perfection of the motion-picture and its use in education and entertainment.

Man was enriched in the quantity of power brought to his service, and in the lowered cost of this power brought about partly by increased production and partly by the growing efficiency of the engines devised for converting coal, gas, petroleum, and waterfalls into power. One advance alone, the perfection and widespread application of the internal-combustion engine, which is the outstanding single achievement of the quarter-century in the field of mechanical advance, added to the service of man not less than

“ *Man was enriched—fabulously enriched—in his access to material goods—comforts, conveniences, luxuries. In 1900 the automobile was a dubious novelty. There were in all less than 8,000 in the United States; by 1925 there were more than 7,000,000. In 1900, there were less than 10 miles of concrete road; by 1925, more than 20,000. In 1900, there was but one telephone for each 66 people; by 1925 it was of practically universal access, with one for each 7 people.* ”

half a billion horse-power. In 1900 the average American farmer had, as the only supplement to his own muscles, the power of two or three horses to carry on his work. By 1925, practically every progressive farmer had an automobile of at least twenty horse-power. Many had tractors of between twenty and fifty horse-power, stationary gas-engines of from two to ten horse-power, and electrical connection with near-by generating plants which put at their command practically unlimited power.

By the harnessing of rivers for the development of electrical power, by immense increases in the size of the units of steam and electricity man can now manufacture and control, the quantity of power brought to his service was multiplied enormously. In 1900 there was but one generating station exceeding 5000 horse-power; in 1925 there were more than fifty stations exceeding 100,000 horse-power. In the total electric power produced in the country the growth was from an aggregate of 3,343,000,000 horse-power hours in 1902 to 74,576,000,000 horse-power hours in 1923, a twentyfold increase.

Man was enriched in his knowledge of the universe. In one field of pure science, understanding of the nature of matter, the advances made between 1900 and 1925 were greater than the sum of all the advances made in all time before.

Man was enriched in his leisure. In 1900 the Saturday half-holiday was practically unknown, and the ten-hour working day for six days a week was still common. It was in 1901 that the Federal Government gave sanction to the eight-hour day by decreeing it for work on government contracts. In 1900, golf was a diversion of the rich, somewhat under disapproval as being effete. A winter trip to Florida or California was yet more exclusively a rare prerogative of the well-to-do. Even the two weeks' summer holiday had barely begun to get under way.

Man was enriched—fabulously enriched—in his access to material goods—comforts, conveniences, luxuries. In 1900 the automobile was a dubious novelty. There were in all less than 8000 in the United States; by 1925 there were more than 17,000,000. In 1900, there were less than 10 miles of concrete road; by 1925, more than 20,000. In 1900, there was but one telephone for each 66 people; by 1925 it was of practically universal access, with one for each 7 people. In 1900, it was recorded that the number of silk stockings sold in the United States was 12,572 dozen pairs—

a pair for one person to each 2000 of the population; in 1921, the number of pairs of silk or artificial silk was 18,088,841—one for each 6 of the people—an increase of access to luxury which, expressed in percentages, almost invades higher mathematics—and destroyed the ancient significance of “a silk-stocking.”

Man was enriched in his knowledge of the surface the earth. During this period both the North Pole and the South Pole were reached. By 1925 there remained no considerable portion of the earth’s surface that had not been explored. By the airplane man achieved his age-long ambition to fly; by the submarine, he achieved the capacity to remain under water and direct his movements there at will. By the wireless he was enriched in his safety on the sea.

In 1900 the great Texas oil-fields were still undiscovered. Radium, helium, the use of vanadium in steel, argon gas, electrolytic waterproofing, high-speed tool steel, the long-distance transmission of photographs, were undiscovered or undeveloped. The Marconi wireless was unperfected. The “loading coil” for long-distance telephoning, the multiplex telephone, the vacuum-tube amplifier were unknown. The tungsten electric light was not yet made. In 1900 there were no oil-burning locomotives, no flotation process for recovering copper, no vacuum cleaners, no self-starter, no electric cook-stoves or electric irons, no fireless cookers, no disk phonographs.

(This section has dealt with the material enrichment of man, only. Whether he was spiritually enriched also; what use man made of his increased years upon the earth, his increased leisure, the energies released by machinery from the need of getting a livelihood—the whole question of the spiritual experiences of man during this period is one about which it is not possible to speak so broadly or so confidently. That, with the speculations that must accompany it, awaits consideration later.)

Innovations in Government

There came in America during this period certain changes in government, certain legislative, political, and judicial innovations. Whether these were all enrichments is a subject of debate, as the changes in science and industry are not. Some would refuse to concede that all the changes in government were advances. In any event they were innovations, the fundamental importance of which warrants almost any superlative. The thirteen most important, and their dates, were:

The *Direct Primary*, beginning in 1900. (Accompanied in some States by the initiative, referendum, and recall.) This gave the people increased control over the selection of their officials; and greatly reduced the power of party machines.

The “*Insular Cases*.” 1901. The decisions of the Supreme Court in these cases made the adjustments whereby the American Government was enabled to possess and administer dependencies.

Conservation, beginning with the Reclamation Act, in 1902. This reversed the government’s previous policy of expediting the transfer of public lands into private ownership. An incident of the adoption of conservation was an extension of the power of the executive branch of the government by Roosevelt, who established the precedent that the President can do whatever he is not expressly forbidden to do by the Constitution or the laws.

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Some in one way, some in another, some combined and some working in diverse ways, this group of innovations during the period 1900-25 worked a political revolution, altered fundamentally the American conception of representative government, altered fundamentally the American conception of the relation of the individual to the government, altered America’s relation to the world, changed measurably the basis of organized society in America, reflected the passing of some of the oldest of America’s ideals, and either gave or reflected a new direction to social evolution in America.

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The “*Lottery Case*.” 1903. This decision of the Supreme Court opened the way for a Federal police power, later exercised in the Pure Food Act, the Meat Inspection Act, and several other important “public welfare” laws. The power was limited subsequently by the decisions in the “Child Labor cases.”

The *Direct Election of United States Senators*. 1913. This reduced the status of the States and, like the direct primary, increased the control of the people over the selection of their representatives.

The *Graduated Income Tax*. 1913. This was an extension of the power of the Federal Government over private property.

Elevation of Organized Labor, illustrated by the Adamson eight-hour law. 1916.

“ *In 1895 there were 300 motor vehicles in more or less continuous operation in America. The qualification “more or less” is used advisedly. The occasional exhilarating periods, when the possessor of one of these 300 could dash along the cobbled thoroughfares of our cities at a continuing pace, were interspersed with hours of laborious “tinkering” and adjusting. Particularly exasperating was the process of starting the motor.* ”

The *Draft* as a mechanism for providing man-power for a war to be carried on abroad. 1917. This was an increase of the power exercised by the government over the individual.

National Prohibition. 1919.

National Woman Suffrage. 1920.

The Limitation of Naval Armament by agreement with other nations at the Washington Conference. 1921.

Extension of Federal Control. When radio and aviation came in, the assumption by the Federal Government of the function of control was uncontested by the States. This constituted an advance in the regulatory power of the Federal Government.

Immigration Restriction and Selection. 1921 and 1924. The adoption of the principle of limiting the immigration from each country to a fixed ratio of the natives of that country already here, was the first American assertion of intention to control the composition of its human stock.

Those thirteen stand out. Some in one way, some in another, some combined and some working in diverse ways,

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The Automobile Emerges

On the streets of Chicago, in September, 1892, appeared a strange vehicle. “Ever since its arrival,” said a contemporary account, “the sight of a well-loaded carriage moving along the streets at a spanking pace with no horses in front and apparently with nothing on board to give it motion, was a sight that has been too much, even for the wide-awake Chicagoan. It is most amusing to see the crowd gather whenever the vehicle appears. So great has been the curiosity that the owner when passing through the business section has had to appeal to the police to aid him in clearing the way....”

If it were desired to set up a monument to the man primarily responsible for the presence, in the year 1925, of 17,000,000 automobiles in the United States, as there are monuments to inventors in other fields, it would be necessary, in this case, for the monument to be a composite figure, the features of which would need to be equitably distributed in the proportions of the claims made by many rivals and their partisans.... Not only as to the automobile as a whole, but even as to most of its fundamental parts, there is no accepted certainty in the allocation of credit for invention.

Doubtless one reason for the greater glibness with which we name the inventors of older mechanisms, like the sewing-machine and the steamboat, is the distance in time since the older machines were perfected. Doubtless it is

partly due also to the fact that at the times when these older machines were invented there was less setting down of things in print—history was more generally in the custody of word-of-mouth tradition, and tradition usually exalts personality. Probably a more discriminating truth would say that in the case of these older inventions there were there, too, contributions from many different pioneers. And possibly, also, the school-boy of a hundred years ahead of us, when asked who invented the automobile, may say “Henry Ford.”

An Adaptation of Old Ideas

The best reason why no name is associated with invention of the automobile is that it was not an invention. Nobody invented it. Certainly nobody in America invented it. The automobile, in America especially, was an assembling, an adapting. Almost every adjunct to the automobile, as it was in 1900, had long been in use in other devices. The transmission, in one form or another, was an essential part of the lathes in every machine-shop and of the driving-wheel of most stationary engines. The frictionless bearing had been developed for the bicycle. The acetylene light was familiar to everybody. In short, the automobile was no more than a coordination and adaptation of old ideas and inventions, some of which, like the wheel, mingled their origins with the mists of antiquity. Possibly, in making such a comprehensive statement, we should except the electric spark used

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first by Benz in 1886 to ignite the explosive mixture in the cylinder of an engine, but even here it should be remembered that long before the human race had evolved intelligible speech, it was known that lightning could start fires: certainly Benjamin Franklin during a June thunder-storm in 1752 produced a real jump-spark with kite and key and his own good knuckles....

In 1895 there were 300 motor vehicles in more or less continuous operation in America. The qualification "more or less" is used advisedly. The occasional exhilarating periods, when the possessor of one of these 300 could dash along the cobbled thoroughfares of our cities at a continuing pace, were interspersed with hours of laborious "tinkering" and adjusting. Particularly exasperating was the process of starting the motor, which frequently entailed the draining of the victim's last reserve of strength, patience, and self-command. Nor, once the motor was started, did the autoist's lot become easy. Switches had to be pressed, and a complexity of pedals and levers had to be operated simultaneously by drivers woefully [*sic*] inexperienced. Frequently when the driver wished to go one way, the car went another. Not infrequently brakes or pedals refused to function, and terror-stricken drivers were carried helplessly along by iron steeds indifferent alike to prayers or curses from behind or obstacles in front. Even when the machines were not in use they were not out of mind of their harassed owners. As public garages had not yet appeared, the cars were kept, as a rule, in livery-stables, the personnel of which had scant sympathy for "man's new servant." Arousing in the breasts of the general public sentiments of curiosity and derision, their delicate mechanisms were subjected to the prying of small boys and stable hangers-on. Under such circumstances the great masses of the people were quite

content to leave the automobile to the "bugs" who seemed to enjoy the struggle, and to the rich whose interest in the ownership of a horseless carriage outweighed the many inconveniences which possession entailed....

The American Contribution To the Mobility of the Masses

While Americans did not invent the automobile, nor have any serious share in the improvement of it, they did make one immense contribution.... It was Americans who made the automobile available to the average man. It is often assumed that the automobile industry was the pioneer of "quantity production," and that among automobile-makers Ford was the earliest to use this system. Neither assumption is correct. The automobile manufacturers merely took up an idea evolved a century earlier by Eli Whitney and elaborated on it to a stupendous, amazing degree. By 1925 "quantity production" had become an essential of American industry, and of importance far beyond its place in business, as being a long step in the enrichment of man, in making goods available to him at a price within his reach.

The early European manufacturers made automobiles "to order" and chiefly for the rich. So also did the early American manufacturers. In 1900 some American manufacturers turned to the idea of making cars in quantities to be offered for sale as a standard article, and at a price that average men could pay. This necessitated abandonment of the fine hand-work of European machines. What these American pioneers of "quantity production" did was to select such parts of European models as were capable of being made in large quantities by machinery. This involved the rejection of some of the best features of the European models. If the thing did not lend itself to machine manufacture, it was

passed by. As a result, the Americans did not make the best machines, nor anything near the best; but they did make an acceptable machine that would start, go somewhere, and return, with a minimum of mechanical trouble, at small expense, and at a cost such that great numbers of people could buy.

In 1900 the Olds Motor Works erected in Detroit what was then the largest automobile factory in the country. They concentrated their entire equipment and abilities on a single model—and that was a fundamental step in developing the theory and practice of quantity production. For the first time in automobile history, parts were ordered in thousand lots: 2000 sets of transmission-gears from Dodge Brothers; 2000 motors from Leland and Faulkner. They sold the car first for \$600; then for \$650. The first year, they make 400 machines; the second, 1600; the third, 4000. The capitalization of the firm was \$350,000, but \$200,000 was all the cash that ever went into the company. The first two years they paid out 105 per cent in cash dividends. That was the indisputable demonstration that the automobile could be more than a rich man's toy. This event, in the year 1900, was the birth of the automobile as a commercial reality.

The innovation of "mass production," "quantity production," "repetitive processes," as it is variously called, was the beginning of the second stage of the automobile, the stage of diffusion, which made it available to all. Mass production was accompanied by a new and enormously expanded development of advertising and marketing. Both mass production and advertising became fundamentally important American institutions, not only as respects the automobile but in the widest sense.

