1. A Woman Reformer Advocates Civic Cleanliness, 1901

Because of the indifference on the part of many of our voters, combined with the exactions of business for others, and the neglect of our city officials in matters pertaining to the betterment of the city, it was forced upon the minds of a number of thinking women that something ought to be done to remedy the existing evils. For this reason, in April, 1890, the Women's Health Protective Association of Brooklyn, N.Y., was incorporated.

Its attention was first drawn to the unsanitary methods of collection and disposal of garbage and ashes. At that time the garbage was carried beyond the harbor

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From Mrs. C. G. Wagner, "What the Women Are Doing for Civic Cleanliness," *Municipal Journal and Engineer* 11, no. 1 (July 1901), p. 35.

and dumped into the sea, only to be washed back again upon the south shore, leaving an unsightly and ill-smelling beach. It was frequently placed upon the walk in paper boxes, grape boxes, and even newspapers have been used for the unfortunate collector to handle, but by constant agitation, to some extent that has been corrected; for, at present, in most localities the receptacles are more in accordance with the city ordinance: "That it should be put in unleakable vessels." The larger portion of the garbage is now cremated, and the association looks forward to the day when it shall all be disposed of in that way.

Another line of work was that of getting the householder to keep the ash cans within the fence line, and when it is complied with, is certainly an improvement on the old way of having a long row of unsightly barrels and boxes lining the edge of the walks, filled to overflowing with worn-out pots and kettles, old brooms, rubbers, umbrellas, and various articles of household waste too numerous to mention.

And now the association has secured the separate removal of rubbish, although not done to its satisfaction, yet hoping some day to reach the point it aims for. . . .

The agitation against the slovenly manner in which the street cleaning was done brought about a better state of affairs, thanks to Col. [George E.] Waring [New York City street cleaning commissioner], for surely the present system far exceeds the old, when the dirt was swept into heaps and left sometimes for days before its gathering, for the winds and wagons to scatter it again. Though fallen below Col. Waring's standard, still it is in great advance of the past.

The unsanitary plumbing in some of the public schools was brought to the notice of the association as being detrimental both to the morals and the health of the pupils. On investigating, a sad state was found in some of them and continues the same to-day. Lack of funds was the excuse given for the condition of the buildings, though languages and the higher branches could be taught at a great expense to the taxpayers. Very little has been done, and the association intends to continue its efforts until these things are remedied.

Among the minor reforms of the association was getting the piggeries removed beyond the city line. The placing of cans on the street corners for waste paper is another reform, and the overflowing condition of some show how useful they are and how much would otherwise be distributed in the streets. An uncleanly obstruction on the edge of the walk was the grocers' coal boxes; they are now placed against the house. To a great extent the association has succeeded in having carts that were left standing in the streets stabled elsewhere. The distribution of circulars on the streets has claimed its attention for years, but success in that direction has not come yet.

"The secret of success is constancy of purpose."

2. Upton Sinclair Describes the Chicago Stockyards, 1905

It was in the stockyards that Jonas' friend had gotten rich, and so to Chicago the party was bound. They knew that one word, Chicago—and that was all they needed to know, at least, until they reached the city. . . .

From Upton Sinclair, *The Jungle*. New York: Harper & Brothers, 1905, pp. 24–26. 32–36.

A full hour before the party reached the city they had begun to note the perplexing changes in the atmosphere. It grew darker all the time, and upon the earth the grass seemed to grow less green. Every minute, as the train sped on, the colors of things became dingier; the fields were grown parched and yellow, the landscape hideous and bare. And along with the thickening smoke they began to notice another circumstance, a strange, pungent odor. They were not sure that it was unpleasant, this odor; some might have called it sickening, but their taste in odors was not developed, and they were only sure that it was curious. Now, sitting in the trolley car, they realized that they were on their way to the home of it—that they had traveled all the way from Lithuania to it. It was now no longer something far off and faint, that you caught in whiffs; you could literally taste it, as well as smell it—you could take hold of it, almost, and examine it at your leisure. They were divided in their opinions about it. It was an elemental odor, raw and crude; it was rich, almost rancid, sensual, and strong. There were some who drank it in as if it were an intoxicant; there were others who put their handkerchiefs to their faces. The new emigrants were still tasting it, lost in wonder, when suddenly the car came to a halt, and the door was flung open, and a voice shouted—"Stockyards!" . . .

Then the party became aware of another strange thing. This, too, like the odor, was a thing elemental; it was a sound, a sound made up of ten thousand little sounds. You scarcely noticed it at first—it sunk into your consciousness, a vague disturbance, a trouble. It was like the murmuring of the bees in the spring, the whisperings of the forest; it suggested endless activity, the rumblings of a world in motion. It was only by an effort that one could realize that it was made by animals, that it was the distant lowing of ten thousand cattle, the distant grunting of ten thousand swine. . . .

There is over a square mile of space in the yards, and more than half of it is occupied by cattle pens; north and south as far as the eye can reach there stretches a sea of pens. And they were all filled—so many cattle no one had ever dreamed existed in the world. Red cattle, black, white, and yellow cattle; old cattle and young cattle; great bellowing bulls and little calves not an hour born; meek-eyed milch cows and fierce, long-horned Texas steers. The sound of them here was as of all the barnyards of the universe; and as for counting them—it would have taken all day simply to count the pens. . . .

"And what will become of all these creatures?" cried Teta Elzbieta.

"By tonight," Jokubas answered, "they will all be killed and cut up; and over there on the other side of the packing houses are more railroad tracks, where the cars come to take them away."

There were two hundred and fifty miles of track within the yards, their guide went on to tell them. They brought about ten thousand head of cattle every day, and as many hogs, and half as many sheep—which meant some eight or ten million live creatures turned into food every year. One stood and watched, and little by little caught the drift of the tide, as it set in the direction of the packing houses. There were groups of cattle being driven to the chutes, which were roadways about fifteen feet wide, raised high above the pens. In these chutes the stream of animals was continuous; it was quite uncanny to watch them, pressing on to their fate, all unsuspicious—a very river of death. . . .

They climbed a long series of stairways outside of the building, to the top of its five or six stories. Here was the chute, with its river of hogs, all patiently toiling

upward; there was a place for them to rest to cool off, and then through another passageway they went into a room from which there is no returning for hogs.

It was a long, narrow room, with a gallery along it for visitors. At the head there was a great iron wheel, about twenty feet in circumference, with rings here and there along its edge. Upon both sides of this wheel there was a narrow space, into which came the hogs at the end of their journey; in the midst of them stood a great burly Negro, bare-armed and bare-chested. He was resting for the moment, for the wheel had stopped while men were cleaning up. In a minute or two, however, it began slowly to revolve, and then the men upon each side of it sprang to work. They had chains which they fastened about the leg of the nearest hog, and the other end of the chain they hooked into one of the rings upon the wheel. So, as the wheel turned, a hog was suddenly jerked off his feet and borne aloft.

At the same instant the ear was assailed by a most terrifying shriek; the visitors started in alarm, the women turned pale and shrank back. The shriek was followed by another, louder and yet more agonizing—for once started upon that journey, the hog never came back; at the top of the wheel he was shunted off upon a trolley, and went sailing down the room. And meantime another was swung up, and then another, and another, until there was a double line of them, each dangling by a foot and kicking in frenzy—and squealing. The uproar was appalling, perilous to the eardrums; one feared there was too much sound for the room to hold—that the walls must give way or the ceiling crack. There were high squeals and low squeals, grunts, and wails of agony; there would come a momentary lull, and then a fresh outburst, louder than ever, surging up to a deafening climax. It was too much for some of the visitors—the men would look at each other, laughing nervously, and the women would stand with hands clenched, and the blood rushing to their faces, and the tears starting in their eyes.

3. Jane Addams Works to Control Garbage in Chicago, 1910

One of the striking features of our neighborhood twenty years ago, and one to which we never became reconciled, was the presence of huge wooden garbage boxes fastened to the street pavement in which the undisturbed refuse accumulated day by day. The system of garbage collecting was inadequate throughout the city but it became the greatest menace in a ward such as ours, where the normal amount of waste was much increased by the decayed fruit and vegetables discarded by the Italian and Greek fruit peddlers, and by the residuum left over from piles of filthy rags which were fished out of the city dumps and brought to the homes of the rag pickers for further sorting and washing.

The children of our neighborhood twenty years ago played their games in and around these huge garbage boxes. They were the first objects that the toddling child learned to climb; their bulk afforded a barricade and their contents provided missiles in all the battles of the older boys; and finally they became the seats upon which absorbed lovers held enchanted converse. We are obliged to remember that all children

From Jane Addams, *Twenty Years at Hull-House.* New York: Macmillan, 1930 [1910], pp. 281–287, 293–294.

eat everything which they find and that odors have a curious and intimate power of entwining themselves into our tenderest memories, before even the residents of Hull-House can understand their own early enthusiasm for the removal of these boxes and the establishment of a better system of refuse collection.

It is easy for even the most conscientious citizen of Chicago to forget the foul smells of the stockyards and the garbage dumps, when he is living so far from them that he is only occasionally made conscious of their existence but the residents of a Settlement are perforce constantly surrounded by them. During our first three years on Halsted Street, we had established a small incinerator at Hull-House and we had many times reported the untoward conditions of the ward to the city hall. We had also arranged many talks for the immigrants, pointing out that although a woman may sweep her own doorway in her native village and allow the refuse to innocently decay in the open air and sunshine, in a crowded city quarter, if the garbage is not properly collected and destroyed, a tenement-house mother may see her children sicken and die, and that the immigrants must therefore, not only keep their own houses clean, but must also help the authorities to keep the city clean.

Possibly our efforts slightly modified the worst conditions but they still remained intolerable, and the fourth summer the situation became for me absolutely desperate when I realized in a moment of panic that my delicate little nephew for whom I was guardian, could not be with me at Hull-House at all unless the sickening odors were reduced. I may well be ashamed that other delicate children who were torn from their families, not into boarding school but into eternity, had not long before driven me to effective action. Under the direction of the first man who came as a resident to Hull-House we began a systematic investigation of the city system of garbage collection, both as to its efficiency in other wards and its possible connection with the death rate in the various wards of the city.

The Hull-House Woman's Club had been organized the year before by the resident kindergartner who had first inaugurated a mothers' meeting. The members came together, however, in quite a new way that summer when we discussed with them the high death rate so persistent in our ward. After several club meetings devoted to the subject, despite the fact that the death rate rose highest in the congested foreign colonies and not in the streets in which most of the Irish American club women lived, twelve of their number undertook in connection with the residents, to carefully investigate the condition of the alleys. During August and September the substantiated reports of violations of the law sent in from Hull-House to the health department were one thousand and thirty-seven. For the club woman who had finished a long day's work of washing or ironing followed by the cooking of a hot supper, it would have been much easier to sit on her doorstep during a summer evening than to go up and down ill-kept alleys and get into trouble with her neighbors over the condition of their garbage boxes. It required both civic enterprise and moral conviction to be willing to do this three evenings a week during the hottest and most uncomfortable months of the year. Nevertheless, a certain number of women persisted. . . .

With the two or three residents who nobly stood by, we set up six of those doleful incinerators which are supposed to burn garbage with the fuel collected in the alley itself. The one factory in town which could utilize old tin cans was a window weight factory, and we deluged that with ten times as many tin cans as it could use—much less would pay for. We made desperate attempts to have the dead animals removed by the contractor who was paid most liberally by the city for that

purpose but who, we slowly discovered, always made the police ambulances do the work, delivering the carcasses upon freight cars for shipment to a soap factory in Indiana where they were sold for a good price although the contractor himself was the largest stockholder in the concern. Perhaps our greatest achievement was the discovery of a pavement eighteen inches under the surface in a narrow street. . . . This pavement became the *casus belli* between myself and the street commissioner when I insisted that its restoration belonged to him, after I had removed the first eight inches of garbage. The matter was finally settled by the mayor himself, who permitted me to drive him to the entrance of the street in what the children called my "garbage phaëton" and who took my side of the controversy.

. . . Perhaps no casual visitor could be expected to see that these matters of detail seemed unimportant to a city in the first flush of youth, impatient of correction and convinced that all would be well with its future. The most obvious faults were those connected with the congested housing of the immigrant population, nine tenths of them from the country, who carried on all sorts of traditional activities in the crowded tenements. That a group of Greeks should be permitted to slaughter sheep in a basement, that Italian women should be allowed to sort over rags collected from the city dumps, not only within the city limits but in a court swarming with little children, that immigrant bakers should continue unmolested to bake bread for their neighbors in unspeakably filthy spaces under the pavement, appeared incredible to visitors accustomed to careful city regulations.

4. A Woman Reformer Promotes Smoke Abatement, 1912

The smoke nuisance in St. Louis had grown almost intolerable when the Wednesday Club, a strong, fine organization of five hundred women, took up the question and cast about to see what could be done. This was in December, 1910. Up to that time there had been sporadic attempts, with considerable results from these efforts, made by the Smoke Abatement Committee of the Civic League. The Missouri State Law, a strong law covering all aspects of the question excepting that of locomotives, was passed as a result of their work.

The State Law was excellent, but the work of the Civic League in enforcing the law was almost completely hampered by an ineffective City Smoke Abatement Department and indifference on the part of the public. The City Department had combined the Smoke Abatement Department with the Boiler and Elevator Department, and placed at the head of both a Chief Inspector of Boilers and Elevators, with several deputy boiler inspectors, and *no* deputy smoke inspector. The consequence was that there was no force to look after the smoke nuisance.

The Wednesday Club made tentative inquiry of the Civic League as to the necessity of energetic effort, and received in reply a cordial invitation to cooperate with its Smoke Abatement Committee to secure the enforcement of the (existing) smoke ordinance. After accepting the invitation of the Civic League, the Wednesday Club

From Mrs. Ernest Kroeger, "Smoke Abatement in St. Louis." *The American City* 6 (June 1912), pp. 907, 909.

realized that the movement should be larger and more general than a club movement, and, further, felt the necessity of arousing public opinion. With this end in view a mass meeting of the women of St. Louis was called in the Auditorium of the Wednesday Club and a program provided touching on the smoke nuisance from the standpoint of health, cleanliness, housekeeping, city planning, etc. The program included men and women speakers, some of whom were city officials.

At this meeting, which was crowded, the Women's Organization for Smoke Abatement in St. Louis was formed with 250 paid members. By the next afternoon there were 400 members, and at the present time the membership numbers 1,300. An executive board of twelve women was elected and has had charge of the planning and directing of all the organization's work. These women met weekly the first season and fortnightly the second, and have been enthusiastic and tireless in their crusade against the smoke nuisance.

The first work they took up was districting the city in districts of about five square blocks with volunteer members of the organization as reporters of the smoking chimneys in their districts. Colonel James Gay Butler, one of St. Louis' most public-spirited citizens, came to the assistance of the women with an open purse, stating that he would spend $50,000 if necessary to make St. Louis a clean city. He employed à lawyer and six smoke inspectors to supplement the work of the city, and offered to coöperate with the women in securing legal evidence from their district reports.

These district reports were mailed to the Executive Board of the Women's Organization, where copies were made and forwarded to the newspapers, Colonel Butler's lawyer and the City Department. These cases were then followed up, taken into court and required to comply with the law. For fifteen months Colonel Butler's lawyer and inspectors have secured convictions against offending chimneys, until now the manufacturing districts are pretty well cleaned up. The locomotives, residences and small apartment houses are at present our greatest offenders, and the combined efforts of the women, the Civic League, Colonel Butler and the newspapers are being directed against them. The newspapers have been most powerful allies in the smoke work and have given thousands of dollars of free advertising to the campaign.

The City Department has done all that it could do to coöperate with the Civic League and the Women's Organization. About a year ago the Mayor replaced the former Inspector of Boilers and Elevators with an able man who is doing all he possibly can under his present restrictions.

5. Henry Ford Recalls the Invention of the Automobile, 1922

We have only started on our development of our country—we have not as yet, with all our talk of wonderful progress, done more than scratch the surface. The progress has been wonderful enough—but when we compare what we have done with what there is to do, then our past accomplishments are as nothing. When we consider that more power is used merely in ploughing the soil than is used in all the industrial establishments of the country put together, an inkling comes of how much opportunity

From Henry Ford, *My Life and Work.* Garden City, N.Y.: Doubleday, 1922, pp. 1, 9, 21–32.

there is ahead. And now, with so many countries of the world in ferment and with so much unrest everywhere, is an excellent time to suggest something of the things that may be done—in the light of what has been done.

When one speaks of increasing power, machinery, and industry there comes up a picture of a cold, metallic sort of world in which great factories will drive away the trees, the flowers, the birds, and the green fields. And that then we shall have a world composed of metal machines and human machines. With all of that I do not agree. I think that unless we know more about machines and their use, unless we better understand the mechanical portion of life, we cannot have the time to enjoy the trees, and the birds, and the flowers, and the green fields. . . .

The economic fundamental is labour. Labour is the human element which makes the fruitful seasons of the earth useful to men. It is men's labour that makes the harvest what it is. That is the economic fundamental: every one of us is working with the material world which we did not and could not create, but which was presented to us by Nature. . . .

On May 31, 1921, the Ford Motor Company turned out Car No. 5,000,000. It is out in my museum along with the gasoline buggy that I began work on thirty years before and which first ran satisfactorily along in the spring of 1893. I was running it when the bobolinks came to Dearborn and they always come on April 2nd. There is all the difference in the world in the appearance of the two vehicles and almost as much difference in construction and materials, but in fundamentals the two are curiously alike—except that the old buggy has on it a few wrinkles that we have not yet quite adopted in our modern car. For that first car or buggy, even though it had but two cylinders, would make twenty miles an hour and run sixty miles on the three gallons of gas the little tank held and is as good to-day as the day it was built. The development in methods of manufacture and in materials has been greater than the development in basic design. The whole design has been refined; the present Ford car, which is the "Model T," has four cylinders and a self starter—it is in every way a more convenient and an easier riding car. . . .

It was life on the farm that drove me into devising ways and means to better transportation. I was born on July 30, 1863, on a farm at Dearborn, Michigan, and my earliest recollection is that, considering the results, there was too much work on the place. That is the way I still feel about farming. There is a legend that my parents were very poor and that the early days were hard ones. Certainly they were not rich, but neither were they poor. As Michigan farmers went, we were prosperous. The house in which I was born is still standing, and it and the farm are part of my present holding.

There was too much hard hand labour on our own and all other farms of the time. Even when very young I suspected that much might somehow be done in a better way. That is what took me into mechanics—although my mother always said that I was born a mechanic. I had a kind of workshop with odds and ends of metal for tools before I had anything else. In those days we did not have the toys of to-day; what we had were home made. My toys were all tools—they still are! And every fragment of machinery was a treasure.

The biggest event of those early years was meeting with a road engine about eight miles out of Detroit one day when we were driving to town. I was then twelve years old. The second biggest event was getting a watch—which happened in the same year. I remember that engine as though I had seen it only yesterday, for it was the first vehicle other than horse-drawn that I had ever seen. It was intended primarily for driving threshing machines and sawmills and was simply a portable engine and boiler mounted on wheels with a water tank and coal cart trailing behind. I had seen plenty of these engines hauled around by horses, but this one had a chain that made a connection between the engine and the rear wheels of the wagon-like frame on which the boiler was mounted. The engine was placed over the boiler and one man standing on the platform behind the boiler shovelled coal, managed the throttle, and did the steering. It had been made by Nichols, Shepard & Company of Battle Creek. I found that out at once. The engine had stopped to let us pass with our horses and I was off the wagon and talking to the engineer before my father, who was driving, knew what I was up to. The engineer was very glad to explain the whole affair. He was proud of it. He showed me how the chain was disconnected from the propelling wheel and a belt put on to drive other machinery. He told me that the engine made two hundred revolutions a minute and that the chain pinion could be shifted to let the wagon stop while the engine was still running. This last is a feature which, although in different fashion, is incorporated into modern automobiles. It was not important with steam engines, which are easily stopped and started, but it became very important with the gasoline engine. It was that engine which took me into automotive transportation. I tried to make models of it, and some years later I did make one that ran very well, but from the time I saw that road engine as a boy of twelve right forward to to-day, my great interest has been in making a machine that would travel the roads. . . . It is not possible to learn from books how everything is made—and a real mechanic ought to know how nearly everything is made. Machines are to a mechanic what books are to a writer. He gets ideas from them, and if he has any brains he will apply those ideas. . . .

In 1879—that is, about four years after I first saw that Nichols-Shepard machine—I managed to get a chance to run one and when my apprenticeship was over I worked with a local representative of the Westinghouse Company of Schenectady as an expert in the setting up and repair of their road engines. The engine they put out was much the same as the Nichols-Shepard engine excepting that the engine was up in front, the boiler in the rear, and the power was applied to the back wheels by a belt. They could make twelve miles an hour on the road even though the self-propelling feature was only an incident of the construction. . . .

Even before that time I had the idea of making some kind of a light steam car that would take the place of horses—more especially, however, as a tractor to attend to the excessively hard labour of ploughing. It occurred to me, as I remember somewhat vaguely, that precisely the same idea might be applied to a carriage or a wagon on the road. A horseless carriage was a common idea. People had been talking about carriages without horses for many years back—in fact, ever since the steam engine was invented—but the idea of the carriage at first did not seem so practical to me as the idea of an engine to do the harder farm work, and of all the work on the farm ploughing was the hardest. Our roads were poor and we had not the habit of getting around. One of the most remarkable features of the automobile on the farm is the way that it has broadened the farmer's life. We simply took for granted that unless the errand were urgent we would not go to town, and I think we rarely made more than one trip a week. In bad weather we did not go even that often. . . .

But I did not give up the idea of a horseless carriage. The work with the Westinghouse representative only served to confirm the opinion I had formed that steam was not suitable for light vehicles. That is why I stayed only a year with that company. There was nothing more that the big steam tractors and engines could teach me and I did not want to waste time on something that would lead nowhere. . . .

The gas engine interested me and I followed its progress, but only from curiosity, until about 1885 or 1886 when, the steam engine being discarded as the motive power for the carriage that I intended some day to build, I had to look around for another sort of motive power. In 1885 I repaired an Otto engine at the Eagle Iron Works in Detroit. No one in town knew anything about them. There was a rumour that I did and, although I had never before been in contact with one, I undertook and carried through the job. That gave me a chance to study the new engine at first hand and in 1887 I built one on the Otto four-cycle model just to see if I understood the principles. "Four cycle" means that the piston traverses the cylinder four times to get one power impulse. The first stroke draws in the gas, the second compresses it, the third is the explosion or power stroke, while the fourth stroke exhausts the waste gas. The little model worked well enough; it had a one-inch bore and a three-inch stroke, operated with gasoline, and while it did not develop much power, it was slightly lighter in proportion than the engines being offered commercially. I gave it away later to a young man who wanted it for something or other and whose name I have forgotten; it was eventually destroyed. That was the beginning of the work with the internal combustion engine. . . .

It was in 1890 that I began on a double-cylinder engine. It was quite impractical to consider the single cylinder for transportation purposes—the fly-wheel had to be entirely too heavy. Between making the first four-cycle engine of the Otto type and the start on a double cylinder I had made a great many experimental engines out of tubing. I fairly knew my way about. . . .

I had to work from the ground up—that is, although I knew that a number of people were working on horseless carriages, I could not know what they were doing. The hardest problems to overcome were in the making and breaking of the spark and in the avoidance of excess weight. For the transmission, the steering gear, and the general construction, I could draw on my experience with the steam tractors. In 1892 I completed my first motor car, but it was not until the spring of the following year that it ran to my satisfaction. This first car had something of the appearance of a buggy. There were two cylinders with a two-and-a-half-inch bore and a six-inch stroke set side by side and over the rear axle. I made them out of the exhaust pipe of a steam engine that I had bought. They developed about four horsepower. The power was transmitted from the motor to the countershaft by a belt and from the countershaft to the rear wheel by a chain. The car would hold two people, the seat being suspended on posts and the body on elliptical springs. There were two speeds—one of ten and the other of twenty miles per hour—obtained by shifting the belt, which was done by a clutch lever in front of the driving seat. Thrown forward, the lever put in the high speed; thrown back, the low speed; with the lever upright the engine could run free. To start the car it was necessary to turn the motor over by hand with the clutch free. To stop the car one simply released the clutch and applied the foot brake. There was no reverse, and speeds other than those of the belt were obtained by the throttle. I bought the iron work for the frame of the carriage and also the seat and the springs. The wheels were twenty-eight-inch wire bicycle wheels with rubber tires. The balance wheel I had cast from a pattern that I made and all of the more delicate mechanism I made myself. One of the features that I discovered necessary was a compensating gear that permitted the same power to be applied to each of the rear wheels when turning corners. The machine altogether weighed about five hundred pounds. A tank under the seat held three gallons of gasoline which was fed to the motor through a small pipe and a mixing valve. The ignition was by electric spark. The original machine was air-cooled—or to be more accurate, the motor simply was not cooled at all. I found that on a run of an hour or more the motor heated up, and so I very shortly put a water jacket around the cylinders and piped it to a tank in the rear of the car over the cylinders.

Nearly all of these various features had been planned in advance. That is the way I have always worked. I draw a plan and work out every detail on the plan before starting to build. For otherwise one will waste a great deal of time in makeshifts as the work goes on and the finished article will not have coherence. It will not be rightly proportioned. Many inventors fail because they do not distinguish between planning and experimenting. The largest building difficulties that I had were in obtaining the proper materials. The next were with tools. There had to be some adjustments and changes in details of the design, but what held me up most was that I had neither the time nor the money to search for the best material for each part. But in the spring of 1893 the machine was running to my partial satisfaction and giving an opportunity further to test out the design and material on the road.

6. A Black Migrant Experiences the Urban Environment, 1927

My first glimpse of the flat black stretches of Chicago depressed and dismayed me, mocked all my fantasies. Chicago seemed an unreal city whose mythical houses were built of slabs of black coal wreathed in palls of gray smoke, houses whose foundations were sinking slowly into the dank prairie. Flashes of steam showed intermittently on the wise horizon, gleaming translucently in the winter sun. The din of the city entered my consciousness, entered to remain for years to come. The year was 1927.

What would happen to me here? Would I survive? My expectations were modest. I wanted only a job. Hunger had long been my daily companion. Diversion and recreation, with the exception of reading, were unknown. In all my life—though surrounded by many people—I had not had a single satisfying, sustained relationship with another human being and, not having had any, I did not miss it. I made no demands whatever upon others.

The train rolled into the depot. Aunt Maggie and I got off and walked slowly through the crowds into the station. I looked about to see if there were signs saying: FOR WHITE—FOR COLORED. I saw none. Black people and white people moved

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about, each seemingly intent upon his private mission. There was no racial fear. Indeed, each person acted as though no one existed but himself. It was strange to pause before a crowded newsstand and buy a newspaper without having to wait until a white man was served. And yet, because everything was so new, I began to grow tense again, although it was a different sort of tension than I had known before. I knew that this machine-city was governed by strange laws and I wondered if I would ever learn them.

As we waited for a streetcar to take us to Aunt Cleo's home for temporary lodging, I looked northward at towering buildings of steel and stone. There were no curves here, no trees; only angles, lines, squares, bricks and copper wires. Occasionally the ground beneath my feet shook from some faraway pounding and I felt that this world, despite its massiveness, was somehow dangerously fragile. Streetcars screeched past over steel tracks. Cars honked their horns. Clipped speech sounded about me. As I stood in the icy wind, I wanted to talk to Aunt Maggie, to ask her questions, but her tight face made me hold my tongue. I was learning already from the frantic light in her eyes the strain that the city imposed upon its people. I was seized by doubt. Should I have come here? But going back was impossible. I had fled a known terror, and perhaps I could cope with this unknown terror that lay ahead.

The streetcar came. Aunt Maggie motioned for me to get on and pushed me toward a seat in which a white man sat looking blankly out the window. I sat down beside the man and looked straight ahead of me. After a moment I stole a glance at the white man out of the corners of my eyes; he was still staring out the window, his mind fastened upon some inward thought. I did not exist for him; I was as far from his mind as the stone buildings that swept past in the street. It would have been illegal for me to sit beside him in the part of the South that I had come from.

The car swept past soot-blackened buildings, stopping at each block, jerking again into motion. The conductor called street names in a tone that I could not understand. People got on and off the car, but they never glanced at one another. Each person seemed to regard the other as a part of the city landscape. The white man who sat beside me rose and I turned my knees aside to let him pass, and another white man sat beside me and buried his face in a newspaper. How could that possibly be? Was he conscious of my blackness?