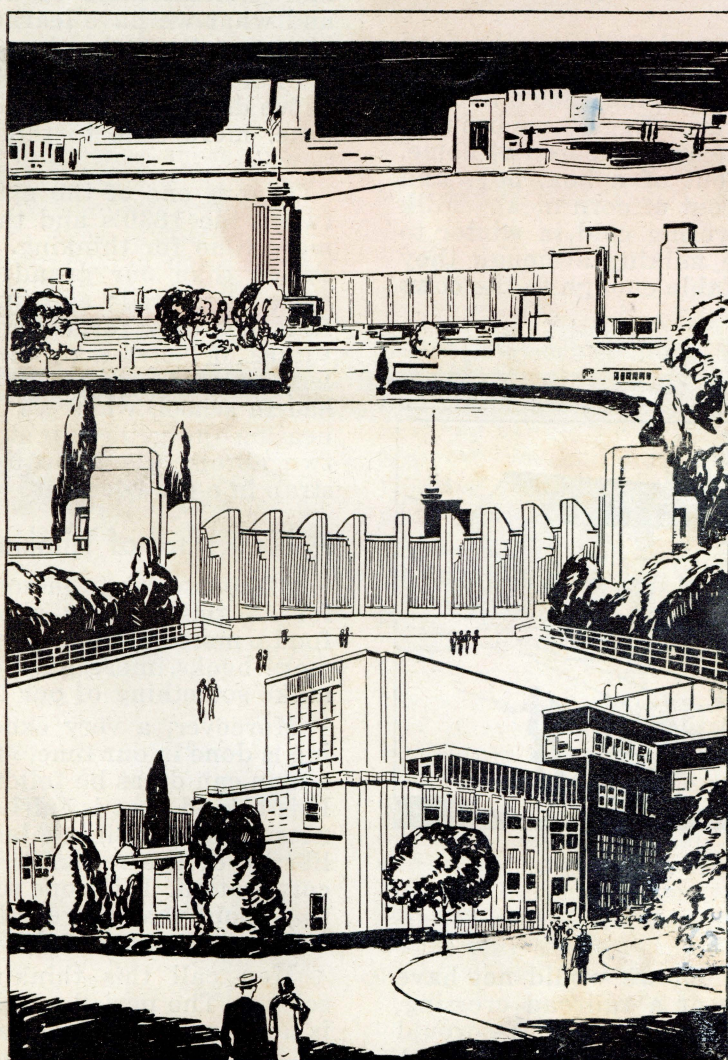


A CENTURY OF PROGRESS

IN

LIVING TOGETHER

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Architectural Examples—A Century of Progress

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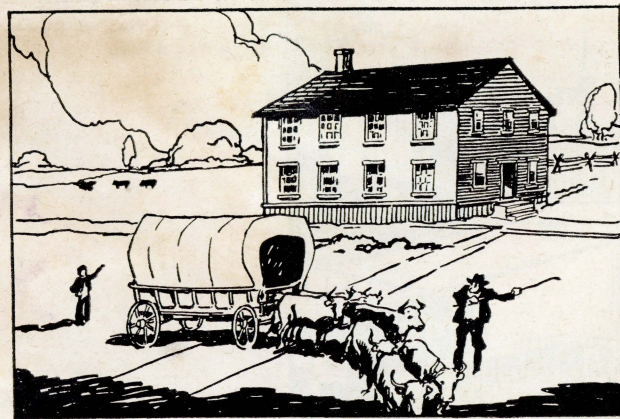
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A CENTURY OF PROGRESS IN LIVING TOGETHER

IF YOU and I had been alive a hundred years ago, we could hardly have done anything in the round of one day after another as we do the same things now.

Waking on a cold, dark morning, we could not reach out and turn on an electric light. We would light a candle instead. The reckless amongst us might experiment with a sulphur match, but if we were conventional and cautious we would strike a fire with a flint. We would not have slept with the window open, because that was not the habit a hundred years ago, and in the cold morning there was no heat to be turned into a radiator by a thermostat, or even a stove to be shaken down and made to glow with welcome warmth.

At breakfast we would find that the food came from near by, not from a store. Nearly all children in America in the 1830's lived in small towns or on farms. Eggs were brought in from the barn. Bacon was cured at home. Instead of a cereal out of a box, boys and girls ate mush made out of corn meal. Milk came from stalls shivering cold in winter to the boy who did the milking although they seemed to be comfortable enough to the cows that gave the milk.



Chicago's First School

On our way to school we would not have waited for the gates at a railroad crossing, because there were no railroads. We would not have looked out for automobiles, because in that day men were only dreaming of carriages without horses. The biggest excitement, above that of cutters sliding past with bells jingling, came if a stage-coach rounded a corner as we ran up to it, the man on the roof blowing his long horn gayly, the buckles on the harness shining, and the

horses, slowing down, breathing steam into the frosty air.

When we reached school we found only one teacher for all the grades, benches without desks, a very few books, and only a few months of schooling for the entire year. Nowadays an American state like Illinois or New York gives education out of the public taxes, requiring by law that fathers and mothers must send their children unless there is a special reason why not. We can picture that life of a century ago pretty well if we read such books as David Copperfield or Nicholas Nickleby and from time to time close our eyes while we think of our grandfathers and grandmothers of a hundred years ago and what we have learned of them from our parents. Soon the thought will come to us:

"For one thing, they did not jump around as we do. They seem to have had more quiet time, more time to think in, than we have now."

That is one of the marked differences between the 1830's and the 1930's: there was more time for thinking. We do many more things than our grandparents did; we are more distracted; as men say, we live faster. It is not easy for us to make plans for our future, or solve a problem in one of today's lessons, or reason out an experiment we have had in school, while we dodge a truck that is beating the yellow light at an intersection of two automobile highways, or swing from a strap in a crowded car.

A New Kind of Thinking

Of course we gain something in exchange for all this rushing about. We have more food, more clothing, more transportation, more books, more play, more opportunity to make something of our lives.

Moreover, a very excellent kind of thinking is done in our time. It is not the kind that a man can do as he follows a horse and plow. It is a kind that is fairly regarded as a business. One does it in a laboratory, or a college library or the research department of a big corporation. It is done so well and so steadily that from year to year it deals with most of our problems and helps us solve them.

Men call this thinking by the name of science. The period of a hundred years which is now coming to a close has been made rich by it. The beginning of the century, when Andrew Jackson was President of the United States and William IV was King of England, was a time of stirring among men, of new kinds of transportation by steamboat and railroad, of new ideas, of new laws, of a new drift to the cities. That stirring grew from year to year. Invention followed upon in-

vention, new idea upon new idea. We of today can realize, looking backward, that it was the thinking called science that has changed our lives.

What Is Progress?

Such are the things we consider when we inquire into progress, as we are doing now, and one of the evidences of change is that instead of being told "You are not old enough to understand such things," the young people of today, as well as their brothers and sisters in college, are encouraged to do such studying in the upper school grades.

At this particular time the attention of students, whether young or old, has been turned to the subject of progress by the celebration which one of the larger cities has adopted for its one hundredth birthday. The city is Chicago. In 1933 it will have had a town government for just a century.

To be sure that is not a long time in the story of cities. Rome has been a great city for two thousand years and Damascus had a government for more than three thousand. Chicago is not celebrating because she is old, or even because she has grown to greatness in so short a time. Rather, her people realize that their city is one of the products of a mighty change and for the observance of their important birthday they are attempting to outline that change so that all the world may understand it better. That is what is signified by the announcement that in 1933 Chicago will hold its second world's fair under the name of "A Century of Progress."

What do we mean, you and I, when we talk together of progress? Roughly, we mean getting along, getting ahead, making life pleasanter. We come nearer to a definition when we think of progress as the satisfying of human wishes. Not all of our wishes, by a long shot. In certain moods some of us might wish for things that would make life anything but pleasanter for the other fellow. But if we can gratify our wishes as members of a company of humans, as residents in a neighborhood, as part of the society of the world, so that life is made more enjoyable for all of us in the whole group, then we shall have what most of us would agree to term progress.

This is a movement which is never finished. In our childhood and our grown-up life both we are always wishing for more than we have. And our wishes are always changing.

We Are Never Satisfied—Fortunately

When our ancestors lived in caves, they wished at first for drinking water, for shelter from the storm and the cold, for protection against wild beasts and human enemies, for food, for something to serve as clothing. After years of development, it would happen that a tribe would satisfy these wishes. Then

the people would find themselves longing after a better cave, one that would remain dry in all weathers, after food that had been cooked in a fire, after grain that had been planted and harvested rather than gathered wild, so that the supply could be depended upon.



The Cave-Man At Home

Our tendency to form new wishes is of the greatest importance to humanity. Suppose we had not had it when we lived in caves. Probably we should have kept on living in caves. Suppose we had not wished for a harvest, yielding us a more abundant food supply and a more regular one. Probably we should still be living on roots, berries and wild fruits. A poet has defined this trait of our nature as a "divine unrest." It keeps us constantly striving.

So if it seems sometimes that we are never wholly content, that we are perhaps a little ungrateful for what we have, we may reflect that if ever once we were to be satisfied we would stop trying to make things better.

But our ancestors did not take hold of this unrest, so to speak, as a thing they could do much about, until the Eighteenth century, and then largely under the influence of a French churchman, known as the Abbe de Saint-Pierre. This man believed that if men would only try from one age to the next they could make life on this earth very much more pleasant and still not lose their chance to be happy after they died. He put his idea into words in 1737.

Thinkers Urge Social Changes

Shortly, the bolder thinkers were proposing changes which they thought would work for the progress of us all. One of the ideas was that everybody might go to school. Another was that we might improve the law as

to crime and the trials of those accused of crime. Another was that there might be pensions for the aged. Another was that there did not really need to be any poverty amongst us anywhere. Even in that early day, another was that there might be a reduction of armies and navies, and that nations might settle their disagreements without fighting, but with the trial of their cases in courts in the way that neighbors settle their disagreements.

Most of us have seen a cake of yeast work in water, and know how it bubbles and boils. In precisely that manner these ideas kept people stirring around uncomfortably through all of the century which is just now coming to



Morse And His First Telegraph

its close. We are now to take up some of the consequences of this bubbling and boiling.

Lengthening Man's Arms

Inventions are among the products of the century which it is easiest for us to study, and in inventions this century has been richer, perhaps, than any other that ever has been.

Usually what the inventor does is to put together things which other men have thought of, and then make them work. This happened when Morse produced the first practical telegraph. Joseph Henry had been sending signals by wire, and in various countries of Europe an attempt had been made to use such signals to send messages. Morse learned that the great need was for a code by which the electrical impulse sent over the wire could be understood at the other end. So he devised an alphabet made up of short signals and long signals—a short signal followed by a long one was A, a long one followed by three short ones was B, and so on. This code, added to Morse's ability to manage a telegraph practically, made men hail him

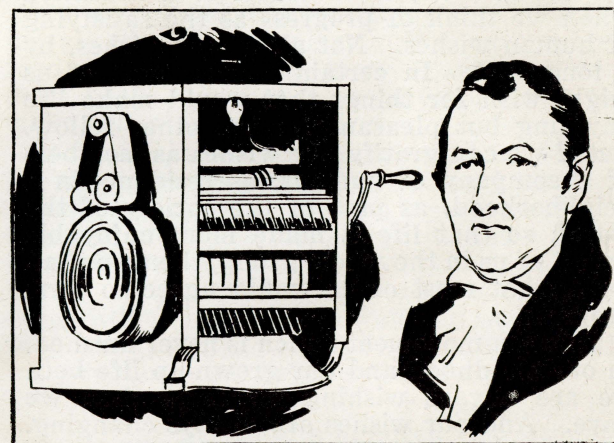
as the inventor, though other men had been sending electric signals by wire before him.

Morse was thinking three questions: "What is it that people need?" "How can they get it?" and "How can I make a profit—either in money or in fame or in consciousness of service—out of supplying it?"

In America there were two kinds of cotton. One was Sea Island cotton, a long fiber that was easy to work with. There was little cotton of this kind. The other kind was a common cotton of short fiber, that could be used if only it could be cleansed of its seeds, for when it came out of the field it was as full of seeds as persimmons are.

An American, named Ely Whitney, solved that need. He set up some wheels with sharp teeth that could chew their way through the cotton, and some combs with long teeth for spitting out the seeds after the wheels had churned them loose. In the year of his invention the export of cotton from the United States was less than half a million pounds, not enough to keep one big mill busy. In 1832, that is to say about 40 years afterwards, the American output of cotton reached the enormous total of 300,000,000 pounds.

Now-a-days if we break a type bar on a writing machine, we can call up the typewriter agency and get another type bar that will fit exactly in place of the broken one. It was not at first the practice to make machines alike. If a thousand men in an army had a thousand rifles, each rifle had to be made to order like a tailor-made suit of clothes. Then if anything on it were to break,



Eli Whitney and the Cotton Gin

the rifle was out of use until a mechanic could cut to measure the exact part that was required.

The same Ely Whitney who had invented the cotton seeder conceived the idea of mak-

ing muskets for the American army so that any part of one gun would fit any gun of the same model. Everyone was doubtful of such a scheme. Whitney went to the American Department of War in Washington, taking with him the parts of ten muskets. He set them up in little piles, the triggers in one pile, the barrels in another, the hammers in another, and so on. He then picked up one piece from each pile and put together a musket. He did this again and again until he had ten muskets. When the tenth was handed around to the group of amazed army officers, we may believe that modern industry had become a vast system of producing manufactured goods in unlimited quantities with interchangeable parts.

Putting The Lightning To Work

There seems to be a sort of fitness in the way in which a discovery or an invention becomes available when the people are ready for it. Electricity is a good illustration. We could never have used it if we had not had the perfection of machinery with which to make electrical appliances and the invention of interchangeable parts with which to keep them in repair. A single electric iron would cost more than the labor of a laundress for a month probably, if it could not be made by machinery and new parts could not be bought in an electrical shop.

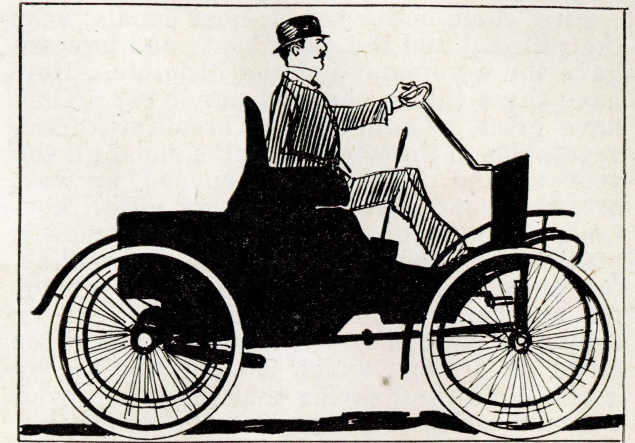
Our country has had a large part in the application of electricity, although the greatest of the pioneers, Volta and Faraday, were Italian and English. It was an American, Thomas A. Edison, who invented the incandescent lamp which is now to be found almost everywhere. The first use of it which commanded the attention of the world was in the Chicago World's Fair of 1893. The researches and energies of Edison and George Westinghouse later found a way of making electricity in unlimited quantities and sending it along to the consumers. The people of the United States use so much electricity today that it is almost as though each of us had 230 full grown men to help him.

The Importance of Electricity

Without electricity we could not have the telegraph, or the telephone, or the radio, or the motion picture projector, or the automobile. Without it we should have to use power where the power was, beside the waterfall or beside the steam engine. Now energy in the form of electricity is distributed hundreds of miles from the waterfall that makes it, and a single steam-operated generator can reach out to serve millions of persons. The words to describe this improvement are technical but any student can understand them. Here they are:

Electricity has made energy distributable. We referred to the automobile in talking of

electricity. It works by still a different kind of power, by the shooting off of cannon under the hood of the car. Instead of powder, the automobile uses gasoline. Instead of a match, it uses electricity to explode the gasoline. This is the internal combustion engine, belong-



An Early Automobile

ing altogether to the second half of the century.

How much the automobile has changed our lives it is too soon now to say. It has put us all on wheels. It has made it possible for all of us to go from the city to the country, and to live far away from our work. It is the first great influence to turn back the old tide which crowded people within the shadow of the factory. With it our cities are now spreading out so that more of our people may live in the open country.

Along with it, too, have come certain abuses. If it is easier with the automobile for the boy and girl of the farm to come into the city to school, and for the doctor to go out in the country to the farm house, it is also easier with the automobile for the robber to escape and the bandit to shoot and run away. Every new help, it seems, can be made into a hurt. It rests with us to see that we use the help and prevent the hurt.

With this reservation, we make no mistake if we count the internal combustion engine as a means of progress almost as important as steam, machines to make machines, and interchangeable parts.

A City Civilization

Let us stop and think a little about the consequences of all this. The towns poured out over the old walls, as someone has said, like batter on a griddle. How ugly they were and unhealthful! What miserable homes they provided! Always there have been slums but never until steam came were there so many.

The townspeople needed to have food brought to them. The factories needed to have their cloth, or their cutlery, or their woodenware taken to their customers wherever they might be. They now gave a new answer to the question, "What is it that people need?" and the answer was "Easier and better ways of moving goods and passengers."

First came better roads; next canals; next the railroad and the steamboat; and now we have the aeroplane and the dirigible. How have these things changed our lives? They have given us oranges for breakfast, fresh vegetables in the winter months, meat all the year around. They have opened up vast areas of soil to provide food for cities thousands of miles distant. They have made it possible for one neighborhood to grow coffee, for another neighborhood to grow rubber, for another neighborhood to mine lead or copper or coal, and then to find a market for all of its product which it could not use by itself. We have a saying that these improved communications, along with the telegraph, the telephone, and the radio, have made the vast world into a little neighborhood.

Factories grew bigger and faster than seemed reasonable. Millions of people crowded close in against the factories. Manchester, in England, is a good illustration. In the year 1800 it had about 95,000 population. Today there are in Manchester borough alone over 766,000 persons, and within a radius of 75 miles from the heart of the city there are more than 14,000,000 persons.

We should think, looking backward, that someone should have sat down in each of these towns to plan for the comfort of the new families, saying:

"Thousands of work people are coming to the mills. First, we must make sure of food for them. Next, they must have shelter. Then there should be stores, schools, churches, doctors, lawyers, streets, sewers, parks, gardens, play and recreation, vistas of beauty, pleasant neighborhoods for them."

There is no good reason why houses which have low rentals should not be as healthful and almost as good looking as houses that have high rentals. Surely it is a stupid thing for us to allow a landlord to rent a house which will foster sickness among the tenants so that the tenants must be cared for by the State in hospitals and asylums.

But no one did any such practical thinking. Houses were put up as investments, and it was not regarded as good government in those days to do anything that would interfere with an investment. The dwellings were small, ugly, unhealthful, and as fast as they were put up they carried into new areas the evils of city slums. All around us in every large city of America we can see evidences of such lack of management.

So the cities grew in all industrial areas.



Your Great-Grandmother Spinning

The bigger ones among them today are several times over bigger than the greatest city of any earlier day. Rome may have had two millions of population. London, Tokyo, New York, Berlin, Chicago in our time, are twice as large as Rome ever was, and most of them are three times as large. In 1833, nine American families out of every ten lived in the country or in little towns. In 1933, six out of every ten live in cities. We have become a city civilization, and we owe the change to the inventions we have been considering in this discussion.

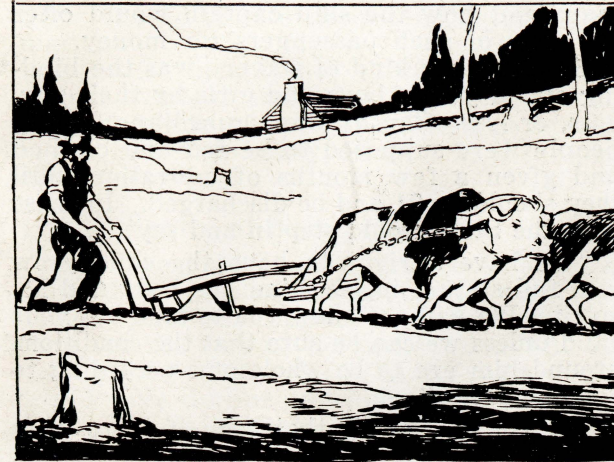
Let us be on guard against assuming that such a flooding of people to the cities has been altogether a benefit to the people. Most of them live in poorer quarters than if they remained in small towns or on the farm. We of the city have better plumbing, better health, more diversion, and more pay. It is easier for us to be well dressed and cleanly. We pay for these gains by giving up neighborliness, the exhilaration of living in the open country with a clear view of the stars, a sense of peace without a nervous, crowded, noisy trip each day back and forth between home and work, and our chance at a dwelling made distinctive by flowers and other beauty.

In The Dirt Under Our Feet

We now come to consider for a moment a kind of progress which has helped us all and yet has made an ancient difficulty more difficult than it was in olden times. I mean the progress and the difficulty of agriculture.

People that lived on a farm in 1833 tried to do everything for themselves. They grew their own grain and vegetables. They spun and wove their own woolen cloth. They cut down timber for their fuel.

They lived together in a way that we of the city can hardly understand. When there was a frame to be set up for a barn, all the neighbors came and made a holiday of it.



Breaking the Ground with Oxen and a Wooden Plow

For meat, in addition to the animals killed on the farm, men and boys would shoot game and catch fish. Those of us who have read the life of Abraham Lincoln know how the young men of the neighborhood used to have wrestling matches and foot races. How different all that is from our city life where sometimes we do not know our neighbors who live across the hallway of an apartment building!

The big factories that were going everywhere pressed upon the farmer to give up many of his old occupations. His wife stopped using the spinning wheel and the loom, and he bought his cloth from the store. In many sections, not needing the wool for his own household, he gave up raising sheep. The farmer who expected to make a living out of wheat and corn found it cheaper to buy pork and beef, and the smokehouse disappeared from his little group of buildings. The picturesque little flour mill which used to be found on every small stream gave way to the mammoth mills in Chicago, Minneapolis and Winnipeg.

The farmer, we see, was finding himself a part of a new commercial world. He was becoming more of a grower and less of a manufacturer.

To help him there came extraordinary offerings from science. Men found out what soil really was. They learned that the ground under our feet is not dead but living, filled with tiny cells of life, and that there is in process down there in the black dirt a constant breaking up of raw materials so that the plants can eat them.

The special colleges that were founded for the study of agriculture and certain special bureaus of the government began to teach farmers in America. They were able to get the better of insects which attack fruit trees and diseases which attack livestock. They

learned how much butter fat there really was in milk, and before long they had improved the breeding of cows so that in meat and milk they produced three times as much as they did in 1850. If today we had to go back to the methods of farm production of 200 years ago, perhaps half of the world would be threatened with starvation.

From these few details we can understand how science has been helping the farmer. With the rest of us he shares in the advantages of production in large quantities. But he is still in difficulty as he has been in many ages.

The Worker Steps Up

Another kind of progress which is not represented by inventions, although inventions helped bring it to pass, is the improvement in the standing of the laborer. He used to have his loom or his forge in his cottage, and now, because of the introduction of power, he has moved down to be near the factory. We do not take the time now to set down all the gains that came to him when he moved and all the losses. It is enough for us to say that his difficulties, the causes of his unhappiness, under the new order were somewhat different from those under the old order.

Work-people were greatly afraid that machinery would take their jobs, and this very thing happened at first. Families sitting with their shutters closed in the industrial towns of England in the early 19th century could hear outside the tramp of men walking the streets in groups and crying out that they had no work to do. After a time it developed that because the machine could make things much more cheaply many more of them could be sold, and then as many men were needed at the machines to produce a vastly larger quantity as used to have work to produce a vastly smaller quantity.

We can see now, looking backwards, that generally the effect of the introduction of the machine was this—it did not decrease employment but rather increased it. Yet, again, in our own time the advance in the working power of the machine has lately been so great, that the only way the old number of work people can be kept at work is to decrease the number of hours they work each day. Someone made a calculation about a year ago that in his experience as a manager of a printing plant the shortening of the work day had added 500 hours of leisure to the work year of the linotype operator.

A consequence of the change in working conditions, and the raising of the standards of education, has been that work-people have organized themselves into groups or unions to make agreements with employers as groups. This is called "Collective Bargaining."

Many who have given careful study to this movement believe that collective bargaining has been at least one of the chief causes

of the improvement in working conditions. And we must not forget that the unions have been a great force in obtaining better legislation, better health conditions, better schools and better citizenship. It would not



A Slave Sold At Auction

be possible now in many lands for an employer to use young boys and girls at the machines of industry.

Kinds of Slavery

Another kind of advance toward better living conditions becomes plain to us as we look into the matters of government and law. A hundred years ago there was a great deal of slavery in the United States and elsewhere in the world.

Some of it was the slavery of the black man and this institution seemed secure beyond shaking. It was very old. Yet black men in America are as free today as white men, and the colored race in this country has been making advances which all of us must admire greatly.

A different kind of slavery was that of men who were put in jail because they owed money. A hundred years ago in all the jails of New England and the Middle States five out of every six prisoners were held there for debt. This is hard for us to believe, especially when we know that in the greater number of cases the debts were for less than twenty dollars each.

Similar to this was the enslavement of men who paid for their passage from Europe on sailing vessels by selling themselves and their labor for a number of years after they should land in the United States. If we will go to the library some day and look over the advertising columns of the newspapers which were published by Benjamin Franklin, we

may read how the ship captain would offer the time of such passengers for money.

Still another kind of slavery was the binding out of young boys and girls by their parents, or less often by their guardians. Young people were supposed to be fed and clothed and given a few months of education until they should be 21 and be discharged. In these days the State would step in and say:

"We have a right to have the child grow into full stature in his mind, his body and his spirit. We will not allow you to bind out your child unless we can be sure that the conditions around him are to be wholesome according to our standards."

The consequence is that even if there were no laws to forbid the binding out of boys and girls, it would be difficult for the one who took them to make money out of them and yet meet the demands of the State.

It Is The Citizen Who Matters

A striking evidence of our progress as a nation in the one hundred years is the success of the American Federal Union. Some 70 years ago a destructive and costly war was fought to determine which it was—a permanent union that could not be cut up into sections, or a partnership of states which could be divided whenever any of the States should decide that the division was necessary. The statesmen of Europe did not expect the Union to live. Tried in the fire of the Civil War, it emerged triumphant, and now it has endured without substantial change longer than the government of any other large union.

The theory underlying our government is that we shall do together by means of the government those things which we cannot do alone, and that we shall not do by means of the government anything which can better be done by the citizen alone. Of course there is a great deal of disagreement as to those things which it is better to have the government do, and those things which it is better to have us do as individuals.

The important thing for us to understand is that such a government depends in the end upon the kind of people that make it. A true Democracy giving equal authority to all its people would need that all its people should be equal to the responsibilities of their citizenship. Simple as this sounds, it presents to us as citizens a very exacting standard.

In the one hundred year period the United States has tried to improve its citizenship by admitting women to full rights along with men. The same tendency to give authority to the people led to the Amendment of the Constitution so that they should vote directly for members of the United States Senate, and, instead of relying upon party conventions to nominate their candidates in all elec-

tions, should choose their candidates at primaries.

It is not meant that these changes have always worked well, but that they reflect the disposition of our government constantly to put more authority directly in the hands of the people.

The Difficulty of Being Humane

Our progress in law has not been as marked as our progress in political principle.

The spirit of humanity is building institutions for the care of the unfortunate and for the training of the strong in all parts of the world. We do not any longer imprison men for debt. It is now possible for married women to hold property in their own name in most of our States.

More significant is the fact that a hundred years ago every workman had to assume practically all the risks of his work, so that when he was injured he and his family were in danger of distress and poverty. More persons were killed and injured in American workshops out of every hundred than in any other country in the world, and more than half of the accidents arose out of conditions which were part of the work days.

Our law for the punishment of criminals has been softened and made more intelligent. We are trying to improve the criminal instead of merely locking him up. We do not hang men for as many different kinds of offenses as we did a hundred years ago. The purpose of the law is not so much to keep men from doing wrong by shutting the offenders behind bars, as it is to prevent wrong-doing by making the offenders more law-abiding and then turn them back as self-supporting workers in society.

In a great number of cases it is clear that the new system—it is called probation and parole—is working fairly well. But in far too many cases it is working only to release the criminal to begin again upon a new career of crime. Our effort to improve the administration of our criminal law is still largely an experiment.

Better Than Shooting Down Youth

Law has been spread in the course of the century so that now, with many restrictions, it operates between nations. We can hardly believe that there ever was a day when a nation did not prefer to resort to rules of right and wrong in its relations with another nation. Yet, from the beginning of history, when nations have disagreed they have settled their disagreements by sending out their young men to be shot down. In the century we are reviewing, there has been barely a year without a war somewhere.

A great step forward was taken in 1899 when most of the nations joined in creating a board of umpires to sit in a city which would be expected to be neutral nearly all



Popular Conception of James Watt Watching Steam Raise Lid of Kettle. Historians Say This Is Only A Myth

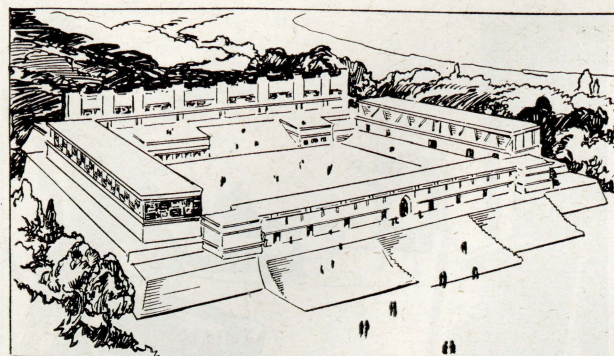
the time—The Hague, in Holland. This was The Hague Tribunal of International Arbitration. It was followed at the close of the Great War, in 1920, by the organization of a League of Nations to discuss the relations between governments and establish new rules of order between them. Out of the war came also in 1922 a High Court of International Justice.

It happens that the United States of America is a member only of the first of the three institutions. Our country does not belong either to the League of Nations or to the High Court of International Justice. Yet it is working with the League in many matters, and its influence upon the League is great; while every President since the Great War has recommended that the United States join the World Court. In this matter touching us all so closely the responsibility is upon each one of us to see that the influence of the United States shall be steadily exercised to maintain a rule of order and right among the nations.

The League and the World Court were the outcome of a war larger and more deadly and more disastrous than any other war that ever has been. This was the World War, which raged from 1914 until the autumn of 1918. By it more wealth was destroyed in all probability than has been devoted to the welfare of humanity in all time; more lives were lost than medicine can save in many years; and the evil consequences of it are not yet ended. Yet it did have the effect of teaching us that great wars now-a-days involve not only the soldiers in the field but the folks who stay at home, and that if we do not destroy war it will shortly destroy us.

Science Serves Us All

Of course the changes of the 100 years in that kind of thinking which we have called Science are altogether thrilling, and it is



The Maya Temple, Reproduced at A Century of Progress

well that another booklet of this series will explain these changes more fully. Let us think of them for a moment as they touch us in our own, intimate, personal, daily lives.

We have noted the influence of new kinds of force to drive machinery, of new ways of moving passengers and freight from place to place, of the sending of messages so that the whole round world is as readily told of the news as a village. We have seen how the dark places have been lighted. Let us look at some other changes and read these sentences together aloud, with a little pause after each one, so that we may think about them:

Science has found a way to look farther into the heavens, giving us a sense of the awful majesty of the universe, and helping the chemist to find a gas, by studying the sun, which will float a great dirigible airship.

It has measured the speed of light, and found in the X-Ray a new light with which it can photograph all the inner organs of the human body so that surgery can be more confidently done.

It has learned of the winds and the weather and of the properties of the air which hold up an aeroplane.

It has given us huge new industries, such as those of petroleum, rubber, photography, and materials that are made out of other substances and mixed together, as in the telephone instrument that we use every day.

It has supplied our houses with chemical refrigeration.

It has found a way to eliminate piteous diseases, such as typhoid fever, to ward off others, and greatly to reduce the inroads of others.

It is waging a war against unfriendly insects.

It has learned of the daily life of the ancients, and it has interpreted old civilizations like that of the Maya in Central America here in our own continent.

It has been studying why we behave like

human beings, and it will surely help us to behave like human beings of a better kind.

Things Beyond Science

Our heads swim when we try to keep all of these changes of the century apart from each other. We cannot keep them apart unless we consider each one long enough to understand it separately.

Then will come the difficult task of trying to understand them as they are laid down upon each other like so many layers of fish net, all of them separate and all of them tied together. Life is not a simple thing for anybody. Understanding it altogether is beyond any man that ever lived.

One thing we must do and that is to remember that life is something more than invention, industry, science put together. There is that within us which is above all of these. Think for a moment of the most beautiful sunset you ever saw! The effect of it upon your innermost self was beyond explaining by any science that has so far been developed.

Other phases of our life which are beyond science, in addition to the love of beauty, are those we call conscience and religion and love of our fellows. All that we have been talking about as the progress of a century in living together would be dreary waste if these qualities were lost from it. The inventor does not think of money alone; often he finds his profit in the knowledge that he has helped others. The artist who paints a landscape does not think only of the fame that may come to him; often he thinks of the pleasure he is carrying over to those who look upon his painting.

Life is not all self; it is largely lived for others. I sometimes think that this thought of others is the salt from which life gets its savor.

In these fields there has been progress as in the other fields.

Religion has been working in the latter part of this century more and more in the manner of serving humanity as well as thinking of the next world.

The arts—painting, sculpture, music, dancing, the drama, prose, poetry, oratory and architecture—are changing so that they are becoming nearer to our life of today rather than copies out of earlier days. We must remember that we know more about the lives we ourselves lead than we can ever know about the lives others have led, and that in all probability our arts will be broader, will have more spirit, and will be more beautiful if we try to portray the things we ourselves do and know best.

We might illustrate this with examples out of many of the arts, but we must be content with examples of only one, Architecture.

For two thousand years mankind has been

imitating the Greeks in designing its buildings. No wonder! The Greeks studied their building problems, the laying of one stone upon another for walls, and the holding up of roofs with columns, and produced a kind of beauty so rare and rich that all of us are impressed by it. To be sure they got a great deal from their predecessors in Egypt and Babylonia, somewhat as we have gotten a great deal from the Greeks. But we have been so unthinking in our copying of the Greeks that now we are in a position that is a little ridiculous.

The great buildings of business and government in our day are not made by laying one stone upon another. They are made with steel frames, and the walls are fitted into the frames. If the bricks come first for the third story, we do not wait until the bricks have come for the first and second stories; we hang the third story bricks in their frame. Even when we make a building that seems to be of stone, we merely put a kind of outside wall paper of stone upon it.

All this is being made plain to the world by the buildings of the new Exposition in Chicago. Its architects have been given liberty to use new materials and new methods of construction. They are not pretending to make buildings of stone. They are openly making buildings of steel and broad slabs.

All over the world men are studying the pictures of these strange structures. And there is a clamorous difference of opinion concerning them. Some folks say that they are not beautiful at all because they are not

like other buildings. Other folks say that they are affecting us like a plunge into cold water, that they are awaking us to realize that there may be beauty which is an outgrowth of our time and not an imitation of anybody or anything.

Four Highway Markers

So our study of living together comes to an end. The other booklets of this series will take us now into one field and now into another, and each field will seem the most important of all as we read of it. Let us remember, as we put our book down, these four things:

Progress is the gratification of human wishes for the common, general good.

Real progress includes all classes.

In light, heat, health, education, transportation, and leisure, the century has specially gratified the wishes of the families of small incomes.

The opportunity of the leaders of tomorrow is to enlarge these gains and help all classes better to enjoy their new leisure. This means more active play out-of-doors, a better understanding of the arts, a larger emphasis upon beauty in our towns, a reverence for the authority which gives life to us, and a further development of good will among us.

If we can have much of such gains, we shall surely have a still greater century of progress in living together.

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