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Co-operation of Engineers and Architects

By DR. FREDERICK H. NEWELL (*)

Mr. President and Gentlemen—

It is a great pleasure to be able to be with you and help in what I hope will be a rather informal discussion of this important subject of co-operation among engineers and architects. At the outset it may be well to lay a foundation, or to define what we have in mind when we speak about engineers, architects and co-operation between them. Each of us, I find has a different conception as to what is meant by the word "engineer." Moreover, we as engineers suffer because the public does not have a clear idea of what we mean when we speak about an engineer.

Primarily, from the meaning of the word, an engineer is "a man of ingenuity," a clever man, a man who lives by the activities of his brain as distinguished from the mere muscular strength of his back and arm. In the original meaning of an engineer as "a man of ingenuity" we have the conception that he is a man who works "above his ears." In the curious way in which language is evolved we have transferred the use of that word from the man who invents the machine, to the man who operates the machine. Now in common, as well as in legal usage, the engineer is the man who operates an engine. If you ask the man on the street, "What is an engineer?" He will reply, "There is an engineer yonder, running that engine." In popular parlance the man who cares for the elevator in this building is an engineer. Look in the dictionary of law terms for the decisions of the courts and you will find that the courts agree that an engineer is a man who operates an engine, usually a licensed mechanic. In Great Britain the oldest engineers' organization, founded in 1851, is the Amalgamated Society of Engineers, one of the most influential of trade unions. It is now too late to successfully restrict the use of the word engineer to the men of ingenuity and of scholarly attainments.

Adopting the every-day definition of engineer we may say there are in the United States, possibly a million engineers, including stationary engineers or engine drivers, locomotive engineers, sanitary engineers or plumbers and so on down a long list; there are many kinds of men who call themselves and who are popularly called engineers.

Among that million men are perhaps a hundred thousand that we, under a more restricted designation, would include as engineers or "near-engineers," men who have been educated in schools, trained to depend upon brain work rather than upon mere muscular activity. This hundred thousand includes men who have had education in practical affairs, in the field and in offices, who have picked up the theory of engineering and who delight in knowledge of the reasons why, dis-

tinguishing them from the mechanic, the man of the million who is simply content to know that the machine goes in certain ways.

This hundred thousand we may consider as the non-commissioned officers of this great army of a million engineers. They are the men who direct immediately the work of the so-called engineer, the mechanic. They are the men who do the computing in our offices, the checking, the inspecting outside, they are the surveyors, the men who carry out the orders from higher up and transmit them to the foreman or to the operatives.

Again there is a still more restricted class, say ten thousand men, that we really think of when you and I speak of engineers. These are the men who get to the top; the men who are really the commissioned officers of this great army of engineers; the men who are prominent in the older technical societies, who hang out their signs as consulting engineers, who are chief engineers and division engineers on the railroads, who have positions of responsibility.

There is one thing to which I wish to refer at this time; a curious situation exists that these non-commissioned officers, the hundred thousand, as a rule, are receiving less wages, than the privates in the ranks. Here is an anomalous situation, one resulting in great unrest among the body of men that we call engineers. I want to point out that distinction because it is vital in our discussion of co-operation.

Now as to the term architect:—What is an architect? In the original sense he was the master builder, the head mason, the man directing building construction. The present usage of the word has departed largely from the original sense and there has been added a secondary meaning, not involved in the old primary thought, that an architect is a man who has something to do with art. Art has been added to the original conception of the master builder; otherwise the architect and the engineer would be practically synonymous. While the engineer, the man of ingenuity and cleverness, is considering the efficiency of his building, the architect approaches the subject from the standpoint of beauty and the correctness of design from an artistic standpoint. Art and architecture had little to do with each other in the original sense of the work. If it were not for this fact the architect and the engineer would naturally be classed together.

The architects have a great advantage, one that the engineers do not possess, namely, that their designation has a definite meaning to the ordinary person. When you speak of architect you have a conception of a man who is learned in construction, who possesses a knowledge not only of the principles of building but who can

(*) See editorial.

adorn the building and make it attractive as well as useful. This name gives them a distinct standing in society such as the engineer does not possess, because, as I have said, no two men can agree on what is an engineer, but they can agree upon the primary conception of an architect.

If those original meanings were still applied to the professions of engineering and of architecture there would be practically no distinction and no necessity of discussing co-operation. However, those distinctions do exist: this fact has brought us to the point of inquiring whether or not we should co-operate and in what way.

What does co-operation mean? We have used the word frequently; I have discussed it often and have tried to bring about co-operation among engineering bodies. It means merely a working together effectively. While such working together is theoretically the wise, the most obvious thing to do yet practically it is one of the most difficult things to bring about because of the tendency of men and organizations to segregate rather narrowly in order to secure higher efficiency; to work along narrow and narrower lines and to keep clear of all entanglements to divert their attention.

In governmental work you would assume that there—where all men are paid by the people and are working for the people there would be the greatest possible co-operation; yet the anomalous condition exists that in the operations of the Federal Government there is little co-operation among governmental bureaus and departments, perhaps less than outside. This is despite the fact that the employes are being paid by the same people and are working to the same end. There is in governmental work a tendency to draw apart, a tendency to secrecy, to not let the other fellow know what you are doing. That has resulted, as Mr. Leighton has undoubtedly pointed out, in waste, in lack of efficiency and in a general decline of respect by the public for its servants engaged in certain governmental activities. One of the great objects of engineers getting together, as pointed out by Mr. Leighton, is to bring about a business-like, effective, sane organization by which men will be forced to work together rather than to pull apart.

Our problem, and the one we wish to discuss is how best we may co-operate and for what reason we should co-operate.

The reason is obvious. It is primarily and fundamentally in order that we, as intelligent men, as citizens may benefit personally. There is no use getting away from that. As pointed out here—there is a reasonably and necessary selfishness running through our plans, yet that selfishness, while we recognize it, is not the beginning nor the end of the problem. An intelligently directed selfishness may bring the highest results to the whole community.

All engineers to a certain extent are men of vision, they are idealists, we can all agree that to put over a successful idea you must have a near as well as a remote object. We might as well admit first as last that we begin primarily with the conception that by co-operation we intend to help ourselves and help our associates. In doing that we are not losing sight of the fact that in helping

ourselves we must help the community and the public at large. Moreover, anything that helps us but is to the detriment of the public we must not tolerate. I want it clearly understood that while starting with the primary assumption that all incentive to co-operation must be founded upon a desire to help to ourselves yet it must not be developed in such a way as to interfere with our great ideals. It must lead to the best result for the common good. I put this proposition to you frankly because in all our plans we must consider not only what is the immediate good but we must not let anything interfere with the ultimate good of the community as a whole; helping ourselves intelligently and wisely, to help the community at large.

How can we do it? As your President has stated, some years ago a number of us got together to discuss co-operation. We were incited to it largely by the vigorous editorials of the man who is to address you, Charles Whiting Baker. He wrote in the *Engineering News* a number of inspiring editorials, he kept hammering on the proposition that we as engineers should co-operate. Finally some of us took him at his word and tried to get together. We did get together and I think we laid certain foundations upon which an enduring structure is being erected. Our first effort was at the meeting of the American Society of Mechanical Engineers in Buffalo on June 24, 1915. A small body of men got together there, talked over ways and means and formed what is known as the Committee on Engineering Co-operation. This body called several well attended conferences, the Second Conference being at Chicago on April 13, 14, 1916, and the third conference on March 29, 30, 1917. These were well attended and the discussions were helpful. Out of them grew a better conception of what could and should be done and what should be avoided.

Thus the whole movement developed prior to and during the early stages of the great world war and was then held in abeyance for a time to see the results. We have tried the experiment of co-operation by voluntary effort on the part of different organizations. We have invited representatives of the engineers and of the architects to get together and to talk over matters of common need and common opportunity. Men have come and have gone back to the bodies for which they were representatives, and have told them something of what was discussed and have given them some of the enthusiasm resulting from the vision of what might be accomplished by working together for a great end.

Out of these conferences came the movement which Mr. Leighton presented yesterday, that on the part of the so-called Founders' Societies, to start at the top, namely in the offices of the powerful societies with headquarters in New York where the officers could get together. I had the honor of being a member of the Engineering Council developed by the officers of those four Founder Societies, and took great interest in the work, but was disappointed that the Council could not develop more enthusiasm. Since I ceased to be a member of that body, it seems to have de-

veloped more energy as shown by the work of Mr. Leighton and I am more optimistic about its outcome from the fact that they did select this friend and associate to represent them in Washington. He is not only a man of energy, a good engineer but one who has the qualities few engineers possess, namely, he knows men, he knows something of politics, he knows how to proceed in a business-like way, a thing to which some of us engineers have not yet caught.

The Engineering Council representing the officers of the Founder Societies is at work as one of the results of these attempts at co-operation, but because of its form of organization it cannot be as effective as a less cumbersome device. It has no power to enforce or carry out its conclusions being simply a Council dependent on the good will of the separate societies and on the personality of its agents. We may theorize about the efficiency of different forms of organization as to how best to organize men; but experience shows that some of these schemes which look well on paper may not work out because they do not appeal to the peculiar spirit of our people.

To illustrate my point, we formerly elected the U. S. Senators by the vote of the State legislatures, but as you know there was a feeling that the Senate thus chosen was not well selected. It was a representative body that was the choice of other representative bodies; this second-hand delegation of power never seemed to work right. A similar criticism is made against any Council chosen in this way.

Or perhaps a more striking illustration of how this kind of co-operation does not satisfy. Before the present constitution of the United States was adopted we had a loose confederation of the States; each state voluntarily co-operated or attempted to co-operate with every other state, the result you know was disastrous. By great good fortune the people of the United States was led to adopt the present form of constitution without which we probably never would have existed as a nation. Theoretically the old way of co-operation among states was perhaps ideal, practically it did not work. Under our constitution we are citizens of the United States first, last and all the time. We are not citizens of the United States because we are citizens of Ohio or because we are citizens of Columbus, but we are citizens of the United States and elect our representatives directly to the United States Congress.

Similarly plans for co-operation among engineering societies have not worked out practically where the citizenship or the membership is represented not directly but by a body chosen as the result of a second or third delegation of power. We want the power to go directly from each citizen or member to the responsible parties.

Because of the recognition of this principle we have started in another form of co-operation, a conclusion reached by going all around the circle, by trying different things and finally reaching this result. Parenthetically I wish to say here that this summer I have spent much time in traveling from the Atlantic to the Pacific from the

Canadian line to Mexico, visiting town after town, talking with engineers in their offices and in their meetings, much as I am talking now, getting acquainted and urging them to co-operate and to get together along the line where every individual man will be represented in a National body not indirectly through a local organization, which in turn delegates its power, but as members of one civic body, engineers and architects, and that is The American Association of Engineers. I hope you will be patient while I exploit this not as the only organization but as the form of organization that I think is going to win. The final outcome may not be in the name of The American Association of Engineers, but it will be some form of organization of engineers and architects which working directly will achieve the result to which we are looking forward.

What is it we desire to do? We want to improve the condition of the engineer and the architect. We want to improve his condition financially, mentally, spiritually, as a citizen, as a man and as a member of a group of trained workers. That is why we are trying to co-operate, subordinating the interest of the individual to the interests of all humanity, and yet in our enthusiasm for these higher things, not forgetting that the man down in the ranks must have his fair share and proper treatment if we are going to have a strong organization. That is what we are working to do in our co-operation.

Some will say at once, and this issue should be met squarely, "These advocates of the A. A. E. are attempting to establish a glorified laboring union." In reply I may state that I do not hold any brief for labor unions. They can take care of themselves; they are well able to do so. But I do desire to point out certain differences between the kind of organization needed to secure co-operation among brain workers and the labor unions.

In the first place the American Association of Engineers is an incorporated body. It is a responsible body. It differs from a labor union in that respect because whatever it does, whatever it agrees to, are matters for which it is responsible. As you know the prime element of labor unions is irresponsibility. Of course there are all kinds of labor unions, as there are all kinds of churches. With some people labor unionism is a religion. Men have given their lives for the labor union. Many of them have done great and good work, others have not, but the danger today to society exists because these labor unions are irresponsible bodies and cannot be held to any agreement into which they enter.

This is an age of organization. The unorganized man is not effective in performing his duties or securing his rights nor is he able to preserve the rights of others. The question before us as engineers and architects, brain workers, is not whether we shall organize, but as to what kind of organization shall we create? Shall we enter an organization that is incorporated, that is responsible, or will we continue to organize the small

groups of technical men to discussing technical topics tabooing all the vital questions of society.

A noted preacher recently said "Some boys go to h— because there is no other place for them to go." Today in the unorganized or disorganized condition among engineers and architects we are forcing men into labor unions because we are not freely admitting them into our specialized societies. The great body of these plain men that I have described as the non-commissioned officers of the army of engineers, the draftsmen, the surveyors, the checkers, these are the men we are forcing into labor unions. That is where my interest lies in this great co-operative movement, namely to get those men organized into a body that is responsible for it's acts, a body in which every man feels that responsibility legally as well as morally.

The labor union is working vigorously among these non-commissioned officers, these hundred thousand, and the promise is made to them that "within two or three years we will have every engineering office so organized that no construction can take place, no building operations, no work in the field unless it is done on plans and specifications that bear the union label and are prepared by union draftsmen, union checkers, union surveyors, union everything except the higher men, the chief engineer and his principle assistant."

That is the condition we are facing. It is not a theory. It is a fact that unless we do co-operate in a sane, definite business-like way, meeting the present conditions of society as they are, this is going to come about in a very few years. That is why I am so intensely interested in upbuilding an organization that will keep these men as I have said, in a responsible body led and officered by natural leaders, men to whom they can look with respect.

That is what I mean by co-operation among engineers and architects. We have worked through and beyond this idea of forming small societies of civil engineers and of mechanical engineers and so on with the idea of then getting them to work together, and somehow out of that thing combination produce a powerful organization. This idea does not work under present economic conditions. For efficiency we must have an organization in which every man is a member just as much as he is a citizen of the United States. That does not prevent his being an active citizen or member of his technical society, any more than your citizenship in the United States prevents you from being a good citizen of Ohio or of Columbus. In fact it strengthens it; but the two citizenships are independent and function without any interference with each other.

This is a day of great unrest resulting as Mr. Beahan has said from the backwash of the war. Everybody wants to go somewhere, but no one knows where he is going. Still they must go. We should recognize this condition and make plans accordingly. We as engineers, men of ingenuity, have the duty of making the very best lemonade "out of the lemons that are handed to

us" and if we do not do it we simply show that we are not engineers, not men of ingenuity.

Those lemons that are handed to us today are lemons of social unrest and disturbance. We must not ignore their existence but we must study the situation. We must organize. We must get together men of every subdivision of engineering, men who work above the ears," we must talk things over man to man and organize to discuss and to help solve these questions of social unrest.

But what is the cause for much of the unrest? As far as engineers are concerned it is because of the fact that the non-commissioned officers, the men who stand between the chief engineer or the architect and the mechanic and workman on the job these men of brains, of education, of experience, or responsibility, men who have to carry out their work not merely during eight, nine or ten hours in the office but who carry their work home,—those men today are getting less wages than the mechanic on the job.

The man who has been through the engineering schools, the man who graduated four or five years ago is today perhaps the cheapest man in the labor market. The youngster just out of college can get what for him are good wages, but the man that has been out four or five years cannot get relatively as much as the young graduate. That is a curious condition but it is so. And he cannot get as much as the janitor who cleans out the waste basket or the "white wing" on the street.

Then the question comes, is that man who has been educated in college entitled to more wages than the man who is sweeping the streets and cleaning out the waste baskets in the office? There is a question here. We have always assumed that he is, but is it so? I cannot help feeling that as men some of these college graduates are perhaps not worth as much as the man who is sweeping the streets or the janitor in the office. In the first place many of them came to college because it was the correct thing to do, or because father wanted them to, or because in such work you did not have to get up in the morning. But the man working as janitor may be a better man; he is trying to bring up a family; he has a little home; he has a garden perhaps; he is a man; he is working and he is putting in his day at hard work and presumably he is doing what he is paid for.

More than that,—and here is the point which should be emphasized—more than that the laborer may be a man who recognizes his duties and demands his rights. In contrast, a characteristic of many of our college educated engineers and assistants in engineering offices is that of timidity, scared of their chiefs,—many of the subordinates in these engineering offices are the most timid people I have ever met, they are fearful of the results of getting together and organizing to discuss their duties and to demand their rights in a proper way as intelligent people.

From the Atlantic to the Pacific, from Canada to Mexico the answer given to the statement that we must get together and talk these things over,—

not to go to extremes, not have hysteria, but talk them over—is that, “we are afraid the head of the office may not approve it.” We would like to do something for ourselves, but we do not dare to do it! That is the attitude of many educated men who call themselves Americans. That is why I asked this question, after all, may not the janitor or the laborer on the streets who is getting more wages than these educated men, be more of a man because he has the manhood at least to get together with his fellows and not be afraid to organize or express his sentiments definitely? I have overdrawn this condition intentionally, in order to present the situation.

Another thing in which this idea of organization of bringing about co-operation between engineers and architects and among all educated men—another fundamental in which it differs from the labor union beyond the mere fact of incorporation, is its ideals—the spirit in which it is working.

The great need today, as pointed out by Mr. Beahan, is increased production. The labor unions, as generally understood, or at least most of them, are fighting for decrease of production in order to force up prices. The American Association of Engineers primarily is founded on an ideal of increased production, delivering more and more for the money paid, better and better results. We take the stand, that men are not equal and that they should not be given equal pay but should receive wages based on efficient production. Every man should be stimulated to increased production, no more and no less than his share of the increased production. All over the country people have been preaching, “keep down production.” Combinations of capital have advanced that idea of giving the least for the money. The organization of cotton growers demands—“Keep down the production of cotton; any man who plants more cotton will be subject to attack; keep the acreage down; force up the price.” We know that is economically wrong; we know it is economically destructive; and we as men with common sense, should get together and fight to the end for increased production and for increased compensation proportionate to that increased production. It is not necessary to dwell upon the fact that here is where we vitally differ from the labor union and capitalist unions.

There is in the world a shortage of all goods, every necessity of life, and the only right thing we can do is to increase production and organize to fight every movement that tries to keep down production and at the same time accompany that effort by seeing to it that a proper compensation is given to all men who are engaged in that increased production.

How are we going to do it? Are you going to organize a union and call a strike to get more money? We say most emphatically we are *not*. In the case of men who are thinking, it is not necessary to do that. While so-called capitalistic organizations may organize a lockout or the labor unions may organize a strike, we believe we can accomplish permanent good, not by force or in-

timidation, but by using the weapons that every intelligent man should use, and that is common sense, argument and reason.

Under present conditions of depreciated currency, where money is worth half or less than half what it was before the war and where the value of currency has dropped the readjustment to meet the altered condition of our standard of value must be met gradually and wisely. And how can it be met? Only by presenting our claims honestly, sincerely and convincingly.

In the case of certain engineers in municipal, public and railroad employ that, relatively to the value of money, they are getting less than the amount to which they are entitled, less than the amount on which they have been accustomed to live and the amount which they should spend to be good American citizens. The thing to do is to present that fact, without the alternative of threats of going on strike, but as intelligent men; educating the public and the people concerned.

We have followed that course, it is not a question of whether results can be had in that way; they have been attained. Such a course is not as spectacular as it is to call a strike, but in the end it accomplishes the result, and it is done in a way that preserves the self-respect of all the men and a proper appreciation of the dignity of their profession.

How to do that? By publicity. Let us take the public into our confidence; day by day educating them. In what way? In the Technical journals? Some of us read technical journals, but the average man does not know what the engineer is or what he has done. Many of my friends say, “let your work speak for itself.” But it cannot speak for itself in the ordinary language. The sewer you build underground, the waterworks, cannot speak for themselves; few people know of their existence unless they get out of order.

What we have to do is to interpret those things in the common vernacular and put the speech into the pages of the papers that the people do read, line upon line, paragraph upon paragraph. Do not expect the editors of the daily papers to use a lot of engineering descriptions. Nobody would read them if they did. They want a short paragraph, one that says something. You realize what is news when you read it. Yet the ordinary engineer cannot write a news article, he cannot write a newsy paragraph. Why? Because he is not accustomed to thinking along the lines of the man who reads the paper. It takes a genius or an expert to write a striking paragraph, to put in a paragraph in a way that the average man, woman and child will read and comprehend, something that you wish to state. It can be done. In our organizations of engineers we seek to develop men who can write and who can get into the newspapers day after day, short statements in which the word “engineer” is used and in which the work of the engineer is properly exploited, not for the benefit of any particular engineer, but to educate the public to know what the engineer is and what he is doing.

(Continued on Page 41)

CO-OPERATION OF ENGINEERS AND ARCHITECTS

(Continued from Page 17)

Why should we do it? For our own benefit? Certainly. But also to educate the public up to the point where they can see the necessity for the work of the engineer and the necessity of fairly compensating him for his work. You know there remains to be done great amounts of engineering work of a kind which will be attempted only when the public appreciates the fact that it can be done and can be done at a proper cost. It is our duty as citizens, as engineers, to educate the public up to a realization of that fact.

Today the public has been educated up to the fact that we need better highways, but they have not been educated up to the fact that those highways must be built, if they are built, to remain by men who know what they are about, by first class engineers. The public is not educated to the fact that it is building miles of roads, expending literally millions of dollars for roads that will not stand for the next two or three years. We engineers know this fact. We have seen the roads go to pieces. We are not performing our duty in this regard and we cannot do it until we form a strong organization, one which will educate the public to know that it cannot spend the money intelligently unless it has engineers to handle this work. We have a duty; this co-operation among engineers and architects must take the form not merely of a program to secure better compensation, but to educate the public as to what the engineer can do and should do, so that the public may gain accordingly.

More than this the engineer should have responsible charge of all engineering work. What is the present condition? You and I know that if a man is appointed to the Supreme bench he must be a lawyer. If not, every law organization in the United States would be up in arms. If the position is a big medical work of course the man must be a doctor. Otherwise every medical organization would be heard in protest. But if a big public work is in contemplation, a public service work, who will be appointed or elected? An engineer? Rarely—almost never. Usually a so-called business man or politician. Will the engineers protest. No—we do not have any organization comparable to that of the doctors and lawyers that could or would protest and make such action impossible. There is where we have a duty in this movement looking toward co-operation among engineers and architects.

We must get together in some form of organization, effective primarily for the benefit of these men, but ultimately looking forward to that larger benefit to humanity. On this basis alone can an organization long exist. We cannot survive permanently if we adopt a low moral plane, if we organize for our exclusion; but if we desire to endure and to have the respect of the public and to put the men of education and experience where they belong, the engineers and architects must be organized and their organization founded on deep principles which will benefit the public and the human race. (Long continued applause.)