

struction of bicycle paths. At the meeting of the Advisory Board, of which Mr. Keefe is Chairman, plans were made for an experimental test road to be built next spring. Another basic problem now under way is a study of the testing process itself, with the hope that this will result in some simple inexpensive tests in the interest of laboratory testing economy.

May I take this occasion to thank the present State Highway Commissioners, Messrs. Crawford, Atcheson, and Dicus, and Messrs. Keefe, Bookwalter, and Feldman, the representatives of the Highway Commission on the Advisory Board, for the constructive co-operation and effective encouragement which they have given to Dr. Hatt, to Professor Petty, and to others at Purdue University who are deeply interested in making the co-operative project of major value to our State. I also wish again to express appreciation for the helpfulness we have received in connection with the Annual Road School from the different groups listed in the program. My own contacts with many of you during the past 17½ years lead me to feel that we in Indiana are most fortunate in the type of people who are concerned with road building and maintenance, as well as in those who represent the road materials and equipment interests in this state.

CONTRACT SYSTEM VERSUS DAY-LABOR OPERATIONS ON HIGHWAY WORK

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This subject is as old as the process of highway construction itself. The Romans, most noted of highway builders of ancient times, built some of their highways by use of the contract system and some of them by the day-labor system, according entirely to the inclinations or philosophy of the existing government. Even in those times, the comparative merits of the two systems were the subject of argument and discussion. When the Romans were in a hurry, or when their resources, as fixed by tax income, were limited, they used the contract system; but when things were running "high, wide, and handsome," the income of the empire was ample, war slaves abundant, and the elective system of administration selection was a vogue, the day-labor system was used. Since those days, this subject of the contract system vs. day labor has been argued and discussed innumerable times; and, throughout the ages, as now, the preponderance of sound, substantial, economic argument was all on one side. Yet despite past experience, the subject is more alive and more vital today than at any period in American history.

I recognize the fact that in my audience there are proponents of both sides of this issue. My own position is positive, and unalterably in favor of the contract system. That undoubtedly was a known fact when I was asked to make this address; yet I am supposed to state the issue and present the arguments for both sides, and this I shall try to do with fairness. After having presented both arguments from an economic standpoint, I shall state the view of the contractor himself.

DEFINITIONS

Before we proceed with the issue, let us exactly define what is meant by the contract system and what is meant by the day-labor system.

Throughout this discussion, when we speak of the contract system, we mean that system of highway construction which involves two agencies: the first, governmental authority; and the second, private enterprise. Governmental authority conceives the project, designs it, prepares the contract documents, plans, specifications, and agreements, and guards the public interest during the construction period. Private enterprise fixes the cost, the method of procedure, and the completion date, and assumes full responsibility for those items, as well as the job personnel, materials, equipment, etc.

The day-labor system involves one agency, that being governmental authority. This agency conceives the project, designs it, employs the supervisory force and the labor, buys the material, furnishes the equipment, and completes the work with everybody on the project, or in any way connected with the project, a direct employee of that governmental authority.

PRELIMINARY STUDY

The argument, in brief, pro and con, on preliminary planning, follows:

1. The day-labor system does not require, nor does it get, the preliminary engineering study which is a feature of the contract system. One of the strong arguments presented for the use of day labor is the saving of time and expense necessary for a thorough study of the project and the preparation of complete plans and specifications. It is argued that the job can be fitted to the conditions as the work progresses. Only preliminary plans are required. Sketchy specifications and written or verbal instructions alone suffice. Preliminary engineering expense is cut to a minimum. Large, expensive engineering staffs are unnecessary.

2. The contract system requires precise, accurate, thorough preliminary study, and the detailed preparation of plans and specifications by skilled engineers who are experts in design. It requires advance study, and advance solution of the engineer-

ing problems inherent in the project. It entails a cost in advance of the start of the project, which frequently is many times that involved up to that point in the day-labor system.

The contractors of the nation maintain that a thorough preliminary study and the preparation of detailed plans and specifications are for the best interests of the project, the highway staff, the construction organization, and the public whom we all serve:

- (a) By its advance thought and its opportunity to bring many trained engineering minds to bear on the problem, thorough preliminary study has avoided costly errors in design and construction and equally costly delays.
- (b) Thorough preliminary study always results in a better completed structure.
- (c) It demands better and better planning, thereby promoting engineering employment and constantly raising the standards of the engineering profession.
- (d) The study has produced an amazing advance in the type of highways and structures, in the economy of their design, and in their durability.

COST

The second of the time-worn arguments as between the two systems is that of cost. Stating the case again before we give the argument, we have these two sides:

1. The day-labor advocates maintain that their system (a) saves the contractor's profit for the public; (b) prevents excessive costs resulting from collusion or price fixing; (c) is necessary to furnish a yardstick to judge costs; (d) and does away with the extortional demands and the colossal profits on extras that contractors make.

2. Advocates of the contract system maintain that (a) it produces the same job at a lesser cost to the taxpayer; (b) collusion or price fixing under modern competitive conditions does not occur; (c) prices fixed by open competition furnish all the yardstick necessary; (d) excessive extras to contractors are extremely rare, and then are due to poor planning or to causes beyond the engineer's or contractor's control; extras are not ordinarily a profitable part of the contract.

The contractor's viewpoint on this matter of cost is this: Under the contract system, the final cost of the project is known in advance. The award is made to the lowest responsible bidder, and the satisfactory completion of the work is guaranteed by both the contractor and a surety company. The public is protected against "jerry-builders" and "haywire competi-

tion," by regulations calling for prequalification as to skill, integrity, and responsibility on the part of the bidder. The cost is determined by competition between the best minds in the industry—competition of those who have proved their fitness by survival in the one industry which statistically, and in every other way, has proved to be the most exacting and selective of all industries. It has been truthfully said, "No expert opinion in this country costs so little to obtain as that obtained by the guaranteed bids submitted in open competition by a group of contractors, each ready to back up his opinion with his own cash."

The sharp two-edged sword of competition plays ruthless havoc among contractors, and only those unusually well-equipped mentally and physically, only those ever alert to new methods and new equipment, only those highly skilled in management and organization, can succeed. All of us have seen contractors come and go, become big operators on their ability to perform or to conceive new methods, and disappear from inability to take the gaff, mistakes in judgment, unforeseen contingencies, or plain lack of ability. All of us have noted that unless they everlastingly keep pace with their competitors, they have been succeeded by the younger group, by the venturesome new-method conceiver, by the brain that analyzes more closely. The conception of new methods has resulted frequently from desperate efforts on a job to meet the cost fixed in the contract price. The great forward march of American construction methods has taken place under the spur of competition.

Some years ago, the day-labor advocates, largely the politicians in congress, pressed for day labor in the federal highway program; and as a result in 1933, the United States Bureau of Public Roads tried a nation-wide experiment to determine the relative economy of the day-labor and contract system on highway construction. Each state was required to select a representative project. Often the actual project was selected by lot. Under no circumstances was the selection to be made so that it would be known before the contractors submitted their bids. The state authorities having picked the projects from a number on which bids had been taken, rejected all bids on those selected, and the state highway departments proceeded to perform the work with their own forces. The project agreement between the state and the federal government required the work to be performed according to the same plans and specifications as governed the contractors' bids.

We have every reason to believe that the Bureau of Public Roads did everything within its power to have this trial carried out fairly and squarely. It must be admitted, however, that the Bureau, in the circumstances, was under some handicaps. In the first place, it could not keep a man on all of the

jobs all the time. Its engineers were able to get around to the jobs only once or twice a month. The representatives of the states in charge of these jobs knew that they were on trial. We are not inclined to think that the representatives of the states on these jobs were more honest than the average contractor. Yet we are quite certain that no governmental agency would care to permit a contractor to go ahead on a project without constant inspection. In this instance, however, the states were their own inspectors, checked their own records, and kept their own time. Knowing human nature as we do, we feel quite certain that, in many cases, there must be some discount made in view of these circumstances.

It might be pointed out that in at least two instances, these being the two that accidentally came to our attention, the Bureau of Public Roads saw fit to reject the project, after it had been carried out by the state, because of flagrant violations of the plans and specifications. In one of these cases the state claimed enormous savings over the contractor's bid. It was shown that the state had not performed the work in accordance with the plans and specifications upon which the contractor bid, and the state was required to undertake another project. Instead of enormous savings, which the state claimed in the former project, the one finally completed showed an increase of 13 per cent in cost above the contractor's bid.

The following are excerpts from the testimony of Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads, given at a hearing before the House Roads Committee, January 22-23, 1935, in Washington, D. C.

"In order to get a reasonable measure of the relative efficiency of contract and force account work, we required each state to undertake at least one project by the force-account or direct-labor method. These projects were selected after bids had been taken in order to know what the work would cost if let to contract. These states have kept very careful records of the cost of doing the work by force account, and in practically all cases the cost has been higher by force account—some materially higher. * * * However, there is no question about the relative economy of contract work versus force-account work under the supervision of the public bodies."

When asked the principal reason for that increased economy in contract work, he replied:

"The principal reason, I think, is that it is very difficult to get the same loyalty and performance from either material suppliers or the employes on the job, to the public, as the contractor can secure."

Without in any manner intending to cast any reflection upon the state highway officials in Indiana, we give herewith

figures on the project undertaken in Indiana under this experiment. It might be well to state that the data we collected on this project were freely submitted by your own state officials, which is evidence enough of their own good faith. Bids on the Indiana project were opened on September 19, 1933. The project was known as N.R.H. 353B, near Liberty, Indiana. It called for the construction of $4\frac{1}{2}$ miles of 20-foot concrete pavement, including grading, etc. Following are interesting figures in connection with this project:

Final cost	\$278,800.00
Contractor's adjusted bid.....	188,600.00
Extra cost under day-labor method.....	90,200.00
Extra cost as a percentage.....	47.8%

It is well to point out here that the general rule in these projects over the country was that they were not finished until long after the date set for completion. This was not true of the Indiana project. The date set for completion was November 1, 1934, and it was completed within a few weeks thereafter.

QUALITY PRODUCED

The third great argument as to the comparative merits of the two systems hinges on the quality of the product produced.

Day-labor advocates have made the claim that, because of direct control of all the elements entering into the project, better quality of the finished product is assured. Contractors refute that claim. They maintain that the day-labor system is a menace to quality because the designing department, the inspection department, and the construction department are in effect one and the same. There is no independent check upon change in plans, methods, or materials. On the other hand, the contractor, at every step in his work, is open to inspection. The materials which go into his job are described in each detail and tested frequently. A representative of the public is always on the job to see that plans and specifications are adhered to. This inspector is not influenced by the interests of the contractor and is, therefore, not affected by natural tendencies to yield to the interests of economy or expediency. Responsibility for cost and the passing of judgment on quality cannot properly be the duty of the same agency.

The day when the words "crook" and "contractor" were considered synonymous is past. By and large, the contractor of today is as proud of the quality of his work as is the engineer who conceived it. More and more, the forces of the contractor have been recruited from the other side of the fence, and his organization is made up of those who received their early training on the planning and inspection side. Quality has been so systematized and so schooled into working forces that it is no longer one of the major problems of the highway program.

Thus we dispose of the "time-worn but potent" issues, namely, preliminary planning, cost, and quality. In each of them, the contract system, by pure weight of logic and by all available statistics, is proved far to surpass the day-labor system.

The problem of the contract system versus day labor would be a simple one if it were merely a question of determining the relative merits and economy of the two systems, but there are other considerations which cannot be overlooked. These are:

1. Political power.
2. Worker's morale and opportunity.
3. Private enterprise.

POLITICAL POWER

Let us examine the subject of political power. Most of our highway work is administered directly by appointive public officials. The great bulk of these are honest, and would personally prefer to conduct their work as efficiently and as economically as possible, and for the best interests of the taxpayer. Consequently, they recognize the superior advantages of the contract system. But they owe their appointment to elective officials and often find it not only difficult but impossible to withstand the pressure to provide jobs to insure votes for those who appointed them, or for those who may be in a position to reappoint them. The politicians cause men to be placed on the work that could not qualify with a contractor. The politicians can put more men—more votes—on a job than a contractor could possibly afford to carry. No contractor can crowd his crew with relatives, friends, friends of friends, and relatives of friends, all soft-job seekers, political hangers-on, economic shirkers, such as crowd the politician and, in desperation, are placed upon the public pay-roll through day-labor operations. No reasonable man in this room, interested in highway construction, about to enter the industry as a contractor, would recruit his working force from a day-labor crew. If he did, that inexorable law, "the survival of the fittest," would polish him off in one season.

WORKERS' MORALE

The subject of workers' morale can be treated very quickly. The greatest advocate of day-labor in construction is Mr. Harry Hopkins. The greatest day-labor construction organization in the history of civilization is the misnamed Works Progress Administration. It has been operating long enough to become efficient if it ever will. Stand, watch in hand, on any WPA job in any part of the United States at any time, and make an honest observation. In October, 1936, on my visit to our Utah Chapter, I was granted the rare privilege of an inter-

view with Heber Grant, President of the Church of the Latter Day Saints, that great religious, philanthropic, and business organization commonly known as the Mormon Church. President Grant had just taken every Mormon, 33,000 of them, off WPA, and I asked him why. His answer was to this effect: "One of the cardinal principles of our church is that a man must earn his livelihood by toil. I personally," said he, "with stop watch in hand, visited WPA projects all over Utah, and the result of my investigation was the conclusion that these men were violating that principle. We took them off of WPA and put them to work to save them." There is no member of the Church of the Latter Day Saints on WPA anywhere.

WORKERS OPPORTUNITY

On the subject of workers' opportunity, may we point out that some of the supervisory staff and a large percentage of the skilled and semi-skilled men in road work in contractors' organizations came up through the ranks from a start as unskilled laborers? Constant opportunity for progress spurs on the ambitious and the deserving. This opportunity does not exist on day-labor work where men are ordinarily not punished for poor services or rewarded for good. The nature of a day-labor organization and its personnel breeds inefficiency, wastefulness, irresponsibility, and plants the seed of indifference so deeply that the effect upon the moral fiber of the workman is not only unwholesome but definitely destructive. Study, by intelligent observation of working crews, the difference between the working spirit of the road gangs under the two methods.

PRESERVATION OF PRIVATE ENTERPRISE

This brings us to the final, and in my opinion, the most vital argument in behalf of the contract system, the necessity for the preservation of private enterprise. In recent years, and particularly in recent months, we have heard a good deal in condemnation of business of the capitalistic and profit system. Those in the attacking position have ready access to the public ear. The profit system, as such, is an economic structure. It has no voice. Nobody rises to its defense. Neither side answers the question, "If not the capitalistic system, then what?" But the construction industry, great laboratory for economic experiment, has the answer. Within it, in every branch, including highway work, the experiment of a socialized industry is being conducted. Day labor in construction is the socialization of the industry. With the merits of the regulation of industry, the restraint of monopoly, the abuse of the power of capital, surplus and surtaxes, or other major bones of contention between the administration and business, we cannot today concern ourselves. Even the

much discussed "wages and hours" legislation we can pass by because the construction industry, and particularly highway work, has long operated upon a minimum wage and maximum hour basis of higher standard than the objective of that legislation.

The cure for much of the nation's economic sickness may be the same medicine of regulation which has been given in large doses to the construction industry. Of that process we can sit complacently by and watch the effect. By and large, many of us agree that, in the past, labor hasn't gotten its just deserts, that there have been abuses. The cure for that is regulation, not annihilation. But to the socialization of our industry, to the performance of construction work by day labor, we in the industry take strong exception. We maintain that shoe manufacturing, cosmetics, textiles, coal mining, automobile manufacturing, or any other major industry, is as susceptible to day-labor operations as construction. In fact, there is more reason for using government forces, day labor, in the production of an absolute necessity such as coal, or a salable article like an automobile, than in the wide open spaces on construction. The measured production of a coal mine or the straight-line process of the automobile industry both lend themselves far better to day labor or WPA personnel than does construction.

The economic system of this nation, though it may need correction in spots, *always has been and right now is better than* that of any other nation. It always has been bound up with private enterprise operating under the competitive system. That system in construction automatically takes care of the laggard, the inefficient; automatically keeps the contractor on his toes; automatically creates progress and economy; and makes for the taxpayer's welfare.

Let us hesitate for a moment with the taxpayer. The total income of the United States for 1937 is estimated at \$68,000,000,000.00. Federal taxes take 7 billions from this income. State and local add 8 billion. A total of 15 billions of taxes on a 68 billion income, about 22%. More than ever in its history, the nation needs a tax base. All of the recovery struggle has been directed toward increasing the national income. Economists assert that a 15-billion-dollar tax program needs a 100-billion-dollar national income to sustain it. When taxes exceed 20%, the whole economic structure of the nation is in peril. Admittedly, taxes cannot be reduced if the budget is ultimately to reach a balance and the debt structure be reduced. The only recourse is an increase in national income. Every piece of construction performed on a day-labor basis reduces the national income, reduces the tax base, reduces the tax income of the nation, dries up taxes at their source. Day-labor, carried on in increasing amounts, perils the whole economic structure of the nation. Only private enterprise is tax-

able, and only private enterprise can be depended upon to pay the bill.

Day-labor, as has been amply demonstrated, thrives on waste and inefficiency, taps the public till for its own shortcomings, creates a political tool of tremendous power, and becomes self-perpetuating. The great example of all this is WPA, the misnamed Works Progress Administration: at one and the same time, the great joke and tragedy of recent years. If the billions that have been fed to that great day-labor octopus had been expended on worthwhile public works through private enterprise, by use of the contract system, the nation would have had the greatest era of useful public works construction in the history of civilization, an equal amount of employment during its performance, and a vast tangible wealth as its result. Now we have nothing except an unemployment and relief problem, further from solution than on its inception; some millions of former good workmen, now prime shovel leaners; and a nationwide set-up that is consuming more than twenty per cent of all taxes. Just such a permanent organization, such a permanent problem, each state, each county, each community takes unto itself when it proceeds with construction under the day-labor system. Leave construction to the contractors of the nation on a competitive system; let them produce a dollar in construction value for each dollar in tax money; let them restore labor's morale by competition on the job, by a re-creation of that pride of accomplishment once inherent in the American workman. Let Russia have its governmental serfdom; Italy its corporate state; Germany its absolute control; France its labor riots and state socialism; but keep America for the competitive system and American enterprise.

HIGHWAY ADMINISTRATION PROBLEMS

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The sole purpose of highway administration should be to provide the best facilities and services for highway traffic possible with the available finances. In order to do this well, the administrator must have a knowledge of present road conditions, of highway needs, and of the funds available. He must also have an efficient organization and personnel, and a long-term plan based on the conditions.

State-wide highway planning surveys are now under way in forty-four states, with a large share of the funds being advanced by the Federal Government. Information will be made available by these surveys as to the present highway