The PALIMPSEST

THE LINCOLN HIGHWAY: 1918

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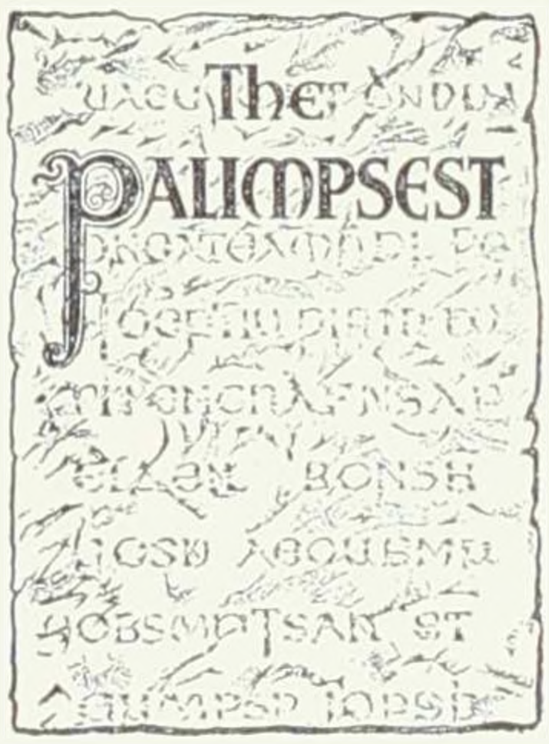

The Meaning of Palimpsest

In early times a palimpsest was a parchment or other material from which one or more writings had been erased to give room for later records. But the erasures were not always complete; and so it became the fascinating task of scholars not only to translate the later records but also to reconstruct the original writings by deciphering the dim fragments of letters partly erased and partly covered by subsequent texts.

The history of Iowa may be likened to a palimpsest which holds the record of successive generations. To decipher these records of the past, reconstruct them, and tell the stories which they contain is the task of those who write history.

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Front — An early motor truck on the Lincoln Highway between Ames and Nevada in 1918. The driver was not consoled by the knowledge that the road had a gravel surface. Unless properly drained a gravel road is no improvement over a dirt road. The Lincoln Highway was the most famous of the name roads that dotted the state and the country before the adoption in the 1920's of the system of numbering roads. The Lincoln Highway became U. S. Highway 30. By 1928 the entire road in Iowa was paved.

Back — Outside: The 1955 map of the Iowa Primary Road System.

All illustrations, unless otherwise noted, are courtesy of the Iowa State Highway Commission.

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ENTERED AS SECOND CLASS MATTER JULY 28 1920 AT THE POST OFFICE AT IOWA CITY IOWA UNDER THE ACT OF AUGUST 24 1912

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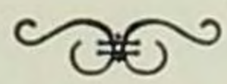


The Old Roads

"A bicycle trip through Iowa is a succession of discomforts," an Iowan reported to fellow bicycle enthusiasts in 1893; "in the Spring the mud renders such a trip impossible; in the Summer the roads, having no foundation, become a perfect sand-bar, through which the wheel slips in all directions, giving the devoted rider many a fall, while the wind whirls the dust about his devoted head, filling his eyes, nose and ears, preventing his opening his mouth to even call down blessings on the man who made the roads." Fall, he declared, was the best season, "but woe be he who wanders far from home, for the least rain ruins the roads for a week, the soft dirt absorbing the moisture readily and the wagons cutting ruts that make cycling a torment."

Poor roads were not confined to Iowa. In 1868 the United States Commissioner of Agriculture declared that good roads "were the exception in all the States." When the Office of Road Inquiry took its first road census in 1904 only a minute

fraction of the nation's 2,150,000 miles of road had hard surfaces, while just 7 per cent were classified as "improved." This term included roads surfaced with stone, gravel, or even sawdust and oyster shells. The remainder were simply dirt roads. Dean Charles F. Curtiss of Iowa State College declared in 1903 that "America has easily the best railway system in the world and at the same time the most inferior public highway system of all the leading and most progressive nations."

Iowa furnished a prime example of the magnitude of the road problem in the large and thinly populated western states. In 1904 it had 102,448 miles of road, ranking third in the nation behind Texas and Missouri. Of this mileage, 1,403 were graveled, 241 were macadam or some other form of stone road, and 20 were surfaced with other materials. All told, only 1.62 per cent of the state's roads were improved, considerably less than in Wisconsin, Illinois, and Minnesota.

Iowa's dirt roads earned it an unenviable reputation as one of the worst "mud road" states, confirming the truth of the old adage, "the better the soil, the poorer the roads." In pioneer days such roads as the famous "ridge roads" had been built to conform to natural drainage patterns. Later, when roads were laid out along section lines as an accommodation to landowners, this advantage was thrown away. "Even animals," C. R. Allen,

Ottumwa engineer, remarked in 1892, "display more engineering skill in the trend of their trails or paths, than we have in locating our roads."

Actually, when dry and well cared for, the Iowa dirt road was an excellent highway. A writer in the Chicago *Tribune* in 1916 declared that only Georgia had natural roads as good as Iowa's, while other outsiders compared the Iowa dirt roads with the best French roads. But no matter how good the roads in dry weather, in wet seasons they became quagmires. In 1840 Judge George G. Wright asked a stagecoach driver how long it would take to reach Iowa City, twelve miles distant. "About five hours," the driver replied, "if we can find the bottom of the road."

Over eighty years later, on November 12, 1922, thousands of football fans left Iowa City after seeing Iowa beat Minnesota in their homecoming game. It had been a damp day, and it began to rain harder after the game. In a short time there was a traffic tieup on the roads out of Iowa City as automobiles which were not equipped with chains became mired in the mud of some of Iowa's best known highways. An estimated five hundred cars stalled between North Liberty and Cedar Rapids alone. Hundreds of motorists and their families spent the night in their cars or at nearby farm houses which they reached on foot. On Sunday, one farmer made $90 in two hours helping to pull cars loose, while the coffers of many other

farm homes were enriched. "Autos Stick in Iowa Muck; Gold Harvest in Iowa," headlined the Chicago *Tribune*.

The consequences of such unreliable roads were numerous. Most attention was given to the economic losses which resulted. In 1899 the Office of Road Inquiry declared that to haul goods a few miles to the railway station cost as much as it did to transport the same goods thousands of miles by rail. At the beginning of the twentieth century most students conceded that the annual national loss from poor roads was at least half a billion dollars. As a good roads writer observed, "Poor roads cost the country $1,500,000 every time the sun goes down."

Owners of vehicles constantly suffered losses due to the damage inflicted on their machines by road conditions. Especially affected in this respect were transportation companies. The struggles of nineteenth century stagecoach lines were matched in the 1920's by the difficulties of the bus companies. In April, 1922, for example, two days after the Red Ball Transportation Company opened the first regular passenger line in Iowa between Charles City and Waverly, heavy rains washed out bus service for five weeks.

Trucking pioneers faced similar handicaps. A large caravan of army trucks on its way to Camp Dodge, Iowa, in April, 1918, was able on its best day to make no more than 46 miles over Iowa's

roads. Even this distance was possible only by traveling from 7 A.M. to 2 A.M. the following morning, and by hooking together like a train so that the trucks could push or pull their way through the mud.

Efforts to advertise Iowa's economic advantages were hampered by the unfavorable reputation of its roads. Industries hesitated to enter the state when they might be unable to obtain necessary materials over the roads for several weeks during the year. In 1923 the Greater Iowa Association spent thousands of dollars on advertisements in eastern papers pointing out the economic wealth of the state. A Connecticut newspaper, perhaps still smarting from Iowa's victory over Yale in 1922, retorted that in Iowa football fans faced the threat of spending Saturday night stuck in the mud. "Who would live in that kind of state," the paper asked, "for all its agricultural wealth?"

Since the Iowa farmer was the principal road user, his losses were the greatest. Iowa's farms were among the leading producers of the country, but the farmer's problem was to get those products to market. An unknown poet observed:

> The Iowa farmer
> Cannot haul to market
> When the market is high;
> He must haul to market
> When the roads are dry.

In addition, muddy roads imposed virtually

complete isolation upon farm families, adding immeasurably to the burdens of an already hard life. Rural school district consolidations, with all their advantages, were difficult to achieve when it was hard enough for school children to attend nearby one-room schools. "The consolidated rural school," Governor George W. Clarke asserted in 1913, "will go halting and crippled until the permanent road passes the door."

Rural churches also suffered. "People will not risk a good car over Johnson county mud roads," the Rev. W. C. Keeler of Iowa City reported in 1926, "and as a result the country churches of Johnson county have been closed the greater part of this winter."

No argument was really required to convince anyone of the importance of road improvement other than to cite the disadvantages of the old roads and the obvious conveniences of having highways that could be used every day in the year. "It really seems absurd," Anson Marston of Iowa State College maintained, "that in a state so wealthy and prosperous as ours, so advanced as regards the education and intelligence of the people, the entire business of the agricultural community, which in Iowa is the basis of practically all business interests, should be left to the mercy of bad weather on account of roads which would be a disgrace even to barbarism."

GEORGE S. MAY

Good Roads Organizations

The good roads movement was part of the general effort to obtain improved transportation facilities which, in the United States, dates from colonial days. The toll road and canal building booms of the early nineteenth century scarcely reached Iowa. The plank road fever of the 1840's and 1850's, however, resulted in the laying of a few score miles of plank in southeastern Iowa before railroad development halted further work.

Until after the Civil War the railroad was more a dream than a reality in Iowa, but it effectively quelled the desire for road improvement. For many years it was thought that railroads would make ordinary roads largely unnecessary. Thus, although there was grumbling about muddy roads, little effort was expended to improve them.

At the end of the century, as the agrarian, rural economy began to give way to one of an industrial, urban character, a new interest in good roads developed in the United States. Railroads connected the cities, but the growing urban centers, for commercial purposes, required a more reliable means of reaching the surrounding rural areas than the existing roads provided. It was local commercial groups, therefore, together with the bicycle and

later the automobile forces, that sparked the good roads movement.

It would be difficult to say when the good roads campaign began in Iowa. A veteran good roads booster declared in 1916: "The fact is there isn't a man in the state of Iowa who is against good roads, and if I can find one who thinks he is, I'll convince him that he isn't." The question has never been should Iowa have good roads, but what were the best roads which it was possible to have at any particular time. The so-called good roads advocates have tended to be the most pessimistic in their appraisal of existing road conditions, and the most optimistic in their estimates of the kind of roads Iowa is capable of supporting.

As early as 1854 Governor Stephen Hempstead gave official recognition to certain specific defects in the road system. Governor Samuel Merrill reported in 1872 that there was "much complaint" regarding road conditions, and he felt there was "much justice in the complaint." Ten years later Governor Buren R. Sherman, in his first inaugural address, stated that it was "painfully evident" that the state's roads needed improving.

In the early 1880's more emphasis began to be placed on road building and less on railroads. The average town which was seeking its second or third rail connection "would be working far more to its own interest and profit," the Des Moines *Iowa State Register* believed, if it spent its time

and money to improve its county roads. Railroads were important, the Cedar Rapids *Republican* conceded, "but it should be remembered that the majority of our people have much more extensive business relations with the citizens of surrounding townships than they have with Chicago, Council Bluffs or Kansas City. Let us develop home markets as well as reach out for distant communities."

On January 3, 1883, Samuel D. Pryce, Iowa City businessman and chairman of the Iowa City Board of Trade's road committee, wrote a letter to the *Iowa State Register*. After vividly portraying the state of Iowa's roads and summarizing the numerous advantages to be gained through their improvement, Pryce exclaimed, "Citizens of Iowa, inaugurate at once in every school district in the State, the agitation of this question. . . . Strike out boldly for public road improvement. The people of Iowa cannot afford to be longer handicapped by mud blockades and bad roads."

Pryce's letter was reprinted throughout the state and was influential in arousing good roads sentiment. The *Iowa State Register* thought it "probable that in no previous paper has so much that is valuable and practical been given to the Iowa public on this subject" as was found in this letter. Newspaper comment was so extensive that the Iowa City *Republican* declared that rarely was "a public question so thoroughly discussed as the

road question has been during the past month. Hundreds of columns have been written on the subject."

In February, 1883, the Iowa City Board of Trade invited "the Boards of Trade, Boards of Supervisors, City and Town Councils, Farmers' Clubs and kindred organizations, to send delegates to a State Road Convention, to assemble in Iowa City, March 1 and 2." Support for the convention was expressed by many newspapers and by such citizens as Governor Sherman, Coker F. Clarkson, and Benjamin F. Gue.

The delegates assembled and organized the State Road Improvement Association. John Scott of Nevada, former lieutenant governor, was elected president, with Herbert S. Fairall, editor of the Iowa City *Republican*, as secretary. The object of the group was "to awaken an interest in favor of the improvement of the public highways, and to secure such legislation as will give us a better system of working the roads."

Sustained effort, however, has been lacking in the Iowa good roads movement. The Road Improvement Association met once more, in 1884, but seems to have passed out of sight thereafter, its members perhaps satisfied with the changes in the road laws enacted in 1884. In the years that followed at least six other groups were organized devoted to the road problem. Once gains were made, however, the organizations folded up.

In August, 1892, a second Iowa Road Improvement Association was organized at Des Moines. The founder of the group and its first president was the editor of the Clinton *Morning Age*, Edward H. Thayer, a nationally known good roads leader. John H. Gear, Peter A. Dey, William Larrabee, Henry Wallace, and John Scott were other active participants in this Association which unfortunately lasted but a short while.

Although a group sometimes called the State Good Roads Association was formed in 1899, the honor of being the first Iowa Good Roads Association probably belongs to the organization created at a convention in Des Moines in April, 1903, called by Governor Albert B. Cummins. It was almost an official organization, not only because of the support of Cummins, but because Charles F. Curtiss, one of the two original State Highway Commissioners, was on its executive committee, while Thomas H. MacDonald, Commission engineer, was secretary-treasurer in 1905-1906.

Like its predecessors, the Association was not a lasting one. As a result, a second Good Roads Association was formed in March, 1910, at a meeting called by Governor B. F. Carroll. Lafayette Young was elected president, Dean W. G. Raymond of the State University of Iowa, first vice-president, and Thomas H. MacDonald was again chosen secretary-treasurer. This group lasted apparently until 1913, when it quietly died.

It is possible that the failure of the legislature to adopt the Association's plans for building and financing surfaced roads contributed to its downfall.

During the next decade the good roads movement was guided by organizations most of which had other interests in addition to roads. The most important of these was the promotional group known as the Greater Iowa Association. Finally, in June, 1923, the third Good Roads Association arose and was at once hailed as "the leader of the good roads movement in Iowa." H. B. Allfree of Newton was elected president, E. T. Meredith of Des Moines, first vice-president, and Mrs. Henry C. Taylor, president of the Iowa Federation of Women's Clubs, second vice-president. A permanent organization was created which, as it turned out, deserved the name. Louis H. Cook, associate editor of the *Iowa Homestead*, acted as temporary secretary until 1924 when Glenn C. Haynes, former state auditor, and a candidate for the Republican nomination for governor in 1924, assumed the position. Believing that its appointed task of seeing the state's primary roads paved was completed, the group expired early in the 1930's.

A permanent solution to the road problem proved as elusive as ever, however, and thus the fourth Good Roads Association, still in existence, was formed at Marshalltown on November 10, 1948. When a permanent organization had been

established, Claud Coykendall, for many years the administrative engineer of the Highway Commission, became executive secretary. In 1953 he was succeeded by Gerald Bogan, a veteran newspaperman, who was publicity director for the Republican party of Iowa from 1949 until assuming his duties with the Good Roads Association.

At the end of 1954 the officers of the organization, in addition to Bogan, included John W. Coverdale of Waterloo, president, Archie Nelson of Cherokee, vice-president, and H. W. Callison of Winterset, secretary-treasurer. Through such devices as a twenty-five minute color movie on Iowa's roads, the sponsorship of essay contests, talks before organizations of all types, printed policy statements, and the tireless efforts of its executive secretary the fourth Good Roads Association has proved itself a worthy successor to the groups which have preceded it.

In recent years conferences have been called by the Association in an attempt to coordinate the efforts of the many groups which in the past have played important roles in the good roads movement. Participants in these meetings have included the Associated General Contractors, the League of Municipalities, the Petroleum Industries Committee, the Press Association, the Rural Letter Carriers Association, the Farm Bureau, and the Motor Truck Association.

The good roads movement has never lacked

support, therefore, but actual progress toward its goals has been slow. The Des Moines *Register and Leader* noted in 1912 that the program of the good roads convention that year was no different from that of similar gatherings of the preceding twenty-five years. Debate had been going on too long, the paper declared. "The time has come to act. . . . There is nothing new to be said today or tomorrow. Everything has been said many times that is worth saying."

A major cause of delay was summed up by former Governor Samuel Kirkwood in a statement to the Road Improvement Association in 1883. He had worked for better roads for many years, he declared, but the results were disheartening for the roads remained bad. "The system is an old one," he pointed out, "and you will find it harder to change than you perhaps imagine it to be. It will not be sufficient that you here lay down a system that you think should take the place of the existing system. You will find the legislators in both branches slow to move and they must be moved upon."

Not only has it been necessary to overcome the conservative attachment for a road system some of whose parts originated in the middle ages, but it has also been necessary to obtain unity within the ranks of the good roads forces. This has been no easy task. Good roads conventions produce lively debates, but frequently little agreement.

Sharp disagreements have existed over particular points. Engineers have argued over the correct width of the roadbed and other technical questions of bridge and road construction. Supporters of the dirt road once disputed the claim of others that road surfacing was necessary. Costly delays have resulted from arguments respecting the relative merits of stone, gravel, brick, concrete, and other types of surfacing. The most bitter fights of all have been between the advocates and opponents of greater centralization of road authority, and between the supporters of the pay-as-you-go plan of road financing, and bond supporters.

Progress has been further slowed by conflicts between the northern counties, blessed with a plentiful supply of gravel and a level terrain, and the southern counties, not so favored in this respect, as to the proper method of distributing road funds. The relative importance of the primary and secondary roads has caused heated debate. Certain groups, such as bridge and road construction companies, and producers of road materials, have opposed changes injurious to their interests.

The farm groups generally have offered the strongest resistance to road improvements, although numerous examples of farmers in the front ranks of the good roads movement could be cited. Farm opposition has resulted, in part, from a fear that farmers would be saddled with most of the expense involved in building good roads.

This latter fear, William Steyh, noted Burlington engineer, observed in 1895, was fanned by "the utterances of some over zealous advocates of expensive paved roads, which created a distrust, nay, almost a panic among the farmers, who could see nothing but mortgaged homesteads as the result of improved roads." Until the 1920's this fear was partly justified. Prior to 1919 farmers paid a total of four mills in property taxes to support the county roads, while residents of first class cities contributed only half a mill. "A monument of inequity and unfairness," was T. G. Harper's description of this situation. Harper, president of the Good Roads Association in 1905, contended that the businessman told the farmer that he had goods to sell, but if the farmer wanted to buy he would have to build the roads over which he must drive.

More tact was needed on the part of good roads advocates, Harvey Ingham declared, after witnessing a farmers' convention in 1893 resolve that the existing roads were good enough. "We don't want any eastern bicycle fellers, or one-hoss lawyers with patent leather boots, to tell us how to fix the roads that we use," one farmer asserted. Yet, Ingham believed, the group "would probably have confessed that some changes might have been made for the better, and undoubtedly could be led to make such changes by a judicious attack upon the most conspicuous evils of the existing system."

GEORGE S. MAY

Road Administration

Administrative reforms, which, it was hoped, would result in more efficient road work, monopolized the attention of the early good roads movement. The chief object of the reforms was to achieve a greater degree of centralized control of the roads. After the federal government and private turnpike companies ceased to exercise much influence upon road policy in the 1850's the states permitted the roads to fall entirely under the administration of local governmental units. Not until the end of the century did the states, led by New Jersey in 1891, begin to assume a responsibility for their highway systems.

In Iowa in the early 1880's the state government exercised no administrative control over the roads. County supervisors had the authority to determine locations of new roads, to change the course of existing roads, and, in certain instances, to levy a county bridge tax. Township trustees each spring determined, within prescribed limits, how great a property tax was to be levied to support the township roads during the coming season, and how much of this tax could be paid with labor rather than with cash. In the fall they divided the township into as many road districts "as they may

deem necessary for the public good." Each district, in turn, had a road supervisor who was elected annually before 1880, biennially thereafter. The supervisor was the official actually in charge of the roads since he spent the money and directed the road work, which was performed by men working out their road taxes.

There was some logic to this system in pioneer days when virtually the only use made of the roads was local in character, but as the state grew and traffic steadily increased in volume doubts arose as to the wisdom of permitting thousands of separate road systems to exist with no unifying standards. Most frequently denounced, perhaps, was the wastefulness of the system. "It is not an extravagant statement," Governor William Larrabee asserted in 1890, "that the taxes collected for the care of highways in Iowa yield a smaller return proportionately than any other imposts. The manner in which these taxes are used is a reproach to people ordinarily provident in private matters."

Under the system of working out taxes "all able bodied male residents" between the ages of twenty-one and forty-five were required to perform two days' road work between April and September in payment of the poll tax. In addition, depending upon the trustees' decision, it was possible to receive credit for part of one's property tax in the same manner.

The system was attacked primarily for its in-

efficiency. In a corn state such as Iowa the farmers were needed in their fields during most of the road working season. The result was that road work was done in the late summer when the farmer could best be spared, but when the least effective work could be performed, or it was left to old men and young boys, despite the legal age limits. This was not the way to keep roads in first-class condition, William Steyh argued. Constant care was required "by a force of men specifically trained and employed for this purpose."

To be sure, working out one's road tax was a source of diversion. John Scott declared that it "left us many pleasant recollections of agreeable gossip and invigorating rests under the shade of neighboring trees and fences. To make this event one of the greatest possible utility and enjoyment, the old brown jug had its place in the fence corner, to which was frequent resort." The supervisor's authority, he said, "was more nominal than real. Doubtless, he was often elevated by his followers to this responsibility because of his capacity and disposition to make the period 'a good time.' "

Chaotic as the entire system may appear, however, it had strong support at the time from those who saw positive virtues in decentralized control. Governor Cyrus C. Carpenter in 1874 even suggested that the road districts be made completely independent of all township control. Such a step would result in better roads, for, he believed, "if

one enterprising district, for the honor of the neighborhood, secures good roads, the adjoining district is stimulated to like enterprise." A group of Warren County farmers begged the legislature in 1884 to "give heed to the call of human rights and equal justice and the great principle of free Government which will leave the road laws and management as they now are in the hands of the People and not under the control of a centralized one man power and moneyed despotism."

Progress toward correcting these defective administrative methods was slow and gradual. In 1884, after Governors John H. Gear and Buren R. Sherman and the State Road Improvement Association had strongly urged changes in the road laws, the first step toward greater centralization of power was taken with the passage of "An Act to Promote the Improvement of Highways." This law marks a turning point in Iowa road history, but it was hardly the "radical change" which Governor Sherman declared was needed. The county supervisors were authorized to levy a one-mill county property tax to be paid only in cash. The tax's proceeds would form a county road fund to be spent "only on the order of the board of supervisors for work done on the highways of the county, in such places as the board shall determine." In addition, township trustees, on petition of a majority of the voters, could organize the township into one road district. Road taxes would then be

paid in cash, and all road funds would be spent by the trustees.

Virtually no townships chose to consolidate their road districts. In 1894 the one-mill county tax was made mandatory in all counties, but aside from this change, road administration in 1900 remained no different than it was prior to 1884.

As a result of increased pressure the Anderson Act of 1902 made the adoption of the township system and the payment of property taxes in cash compulsory. Charles F. Curtiss termed this "the most important step that has yet been taken looking to the improvement of the public highways of this state." The old district system was partially restored in 1909 but was abolished for good in 1913. Until 1929, however, it was still possible in some townships for a man to work out his five-dollar poll tax on the roads.

In 1913 the power of the county supervisors was greatly increased with the establishment of the county road system, which was to include "not less than ten per cent nor more than fifteen per cent" of the total road mileage in the county. These were to be the "main traveled roads" linking the principal market places. Administration of this system was placed in the county supervisors' hands. They also received complete control over all bridges and culverts in the county.

In 1921 the legislature provided that upon a majority vote of the people in any township its road

work could be turned over entirely to the county supervisors. It was obvious that the days of road work on the township level were limited, and in 1929 the Bergman Act eliminated the township as a road administration district as of January 1, 1930. All secondary roads came under control of the county supervisors. By this step the number of officials in charge of the state's secondary roads was reduced from 5,500 to about 400.

The most important reform promoting efficient and expert supervision of the roads on the county level was undoubtedly the creation of the office of county engineer. As early as 1883 Samuel D. Pryce declared that road work should be "under the supervision of a competent civil engineer." In 1892, the legislative committee of the engineers' society presented the General Assembly with a bill establishing the office of county engineer.

No action was taken for many years, however. The opposition's reasoning was revealed in March, 1910, when Governor B. F. Carroll asked the Good Roads Association to support the establishment of a county engineer. The delegates defeated the proposal 315 to 168. One delegate called it a plan for "giving places to a lot of boys from college without accomplishing anything." The idea that trained experts were needed to manage road work was an affront to many local road officials. A Monroe County delegate contended that "they did not have to go to college to get men

capable of using the level." Most of these men would not think of erecting a large public building without competent engineering advice, but they stubbornly refused to regard highway construction as presenting an analogous situation.

As a result of this opposition, good roads forces were compelled to accept a compromise in 1911 whereby the supervisors could, if they desired, employ "a competent person" to draw up plans and specifications for county road work. The general shift in sentiment toward more advanced road administrative methods finally resulted in the creation of the office of county engineer in 1913.

Much opposition remained. Senator A. L. Ames of Traer reported that "probably no part of the [1913 road law had been] criticized more frequently than that part relating to the work done by the county highway engineer." In 1923 the critics succeeded in making the county engineer an optional position. Few counties took advantage of this act, however, and in 1929 the Bergman Act not only repealed it, but also gave the county engineer greater responsibility over the county's road work. By this time most supervisors had come to recognize the engineer's value as they saw him save the county thousands of dollars. One county board chairman declared that if the counties had to choose between the engineer and the supervisor "it would do well to give up the latter because the engineer could do the work of the supervisors but

the supervisors could not do the work of the engineer."

The most important of all administrative reforms was the creation of the State Highway Commission. Samuel D. Pryce, in his prophetic letter of 1883, foresaw the need for some form of state road supervision when he called for the appointment by the governor of highway commissioners in each county. A decade later, Seth Dean, Mills County Surveyor, proposed the division of the state into road districts with boards in charge of their roads. These boards, in turn, would be under the general supervision of a five-man state highway board appointed by the governor.

Finally, in 1904, the General Assembly, at the suggestion of the Good Roads Association, considered setting up a state highway department at Iowa State College, where experimental road work had been conducted for several years. Not enough support could be obtained to establish a separate agency with its own funds, but, through the efforts of Representative F. F. Jones of Villisca, the college itself was directed to act as a Highway Commission. The college was to serve chiefly as an information center for road officials of the state on any questions which they might have regarding highway construction and maintenance. Demonstrations in proper road working methods were to be conducted at least once a year.

The board of trustees of Iowa State College ap-

pointed Deans Charles F. Curtiss and Anson Marston to serve as Commissioners, with Professor Thomas H. MacDonald as full-time assistant. The Commission at first received only $3,500 a year. This was later increased to $5,000 and then in 1910 to $10,000. Despite such limited funds the Commission managed to conduct an annual road school for county and township road officers, launch several important investigations of road conditions, and provide information and advice as directed, although at times it was unable to buy the postage stamps necessary to answer inquiries sent to it. The Commission contended that if its powers and funds were increased it could correct "the record of incompetent and frequently flagrantly dishonest handling of contracts, special bridge contracts, pools and agreements in restraint of competition and the erection of flimsy and inefficient structures and disorganized methods of work," which existed in the state.

The exposure in 1912 of wasteful and even corrupt expenditure of funds, particularly in Polk and Clinton counties, forcing the resignation or removal of several supervisors, aroused greater public support for a stronger Highway Commission.

As a result, the Commission was reorganized in 1913 and its power increased. Despite some belief that the Commission should be located in the state capital, it was retained in its existing offices at Ames. The number of Commissioners was in-

increased to three. The Dean of Engineering at Iowa State College was automatically a member of the Commission. The other two were appointed by the governor. The Commission was granted the power to remove county engineers for reasons of incompetency. All plans for improvements of county roads had to receive its approval before work could begin. Finally, the Commission exercised general supervision over all road work through its power to investigate and to report to the attorney general any delinquencies in the performances of county or township road officials.

The office of Chief Engineer was created to handle this increased authority. Only four men have held this office. Thomas H. MacDonald, the first Chief Engineer, resigned in 1919 to become director of the Bureau of Public Roads. Fred R. White, who had been an assistant engineer since 1910, was Chief Engineer from 1919 until 1952 when he was succeeded by Edward F. Koch. Upon Koch's resignation in 1954 John G. Butter became the fourth Chief Engineer.

Anson Marston, as Dean of Engineering at Iowa State College, continued as Commissioner in 1913. The two appointive Commissioners were James W. Holden of Scranton, Greene County Supervisor, and former president of the Association of County Supervisors, and H. C. Beard of Mt. Ayr, a lawyer well known for his good roads activities.

Powerful opposition to the Highway Commission existed for a number of years. Although official representatives of the county supervisors had asked for many of the increased powers granted to the Commission and although county and township officials retained the power to initiate all road work, many of these officials objected to the Commission's new supervisory powers.

A bill sponsored by Representative James F. Johnston of Lucas County in 1915 would have abolished the Commission but was defeated in the senate after the house approved by a vote of 64 to 43. A similar effort in 1917 by Johnston and Speaker Milton B. Pitt of Harrison County failed in the house after a series of 54 to 54 tie votes. During the bitter fight Woodworth Clum of the Greater Iowa Association referred to Pitt and Johnston as "political pirates who are endeavoring to scuttle the ship of state." Earlier, in 1915, the Manchester *Press* called the anti-Commission movement "an insult to the intelligence and progressive spirit of Iowa people. . . . After years of blind road and bridge patching and tinkering, Iowa has for the first time an authorative body of men who are proceeding along definite, sensible and economical lines, and now it is solemnly proposed to drop back into the wallow and bog along with a discarded and discredited system."

The Highway Commission's power was strengthened when, in 1916, Congress enacted the

Federal Aid Road Act appropriating $75,000,000 to be distributed among the states during the following five years as assistance in important road building projects. This action almost restored the federal government to the position with respect to roads which it held early in the nineteenth century.

The creation of the Office of Road Inquiry in 1893 was the start of this reassertion of power. This agency, the forerunner of the modern Bureau of Public Roads, served largely as an information center until 1912 when Congress appropriated $500,000 to be used to aid in the construction of post roads and gave the office supervision over the expenditure of these funds. The federal government allotted each state $10,000 for the improvement of a road over which "rural mail service had been or might thereafter be carried," if the state provided $20,000, and the plans for the road and the finished work were approved by federal officials. Iowa received $30,000 from this fund.

The much more ambitious act of 1916 required the states to match federal aid with an equal amount of money. In addition, each state had to have a state highway department capable of handling and overseeing the expenditure of the money. Governor Harding called the aid "a form of lottery." Not to accept the money, however, would be unjust to the taxpayers of Iowa, so the Governor asked the legislature "to choose a course in this respect which will not lend encouragement to

this wasteful form of appropriation and expenditure, while securing to ourselves some crumbs from the feast we have been forced to spread." The General Assembly in 1917 accepted the proffered aid, matching it with motor vehicle license fees.

At the same time, the Highway Commission was directed to select a system of roads on which federal aid would be used. In 1919 this became the primary road system under the provisions of the primary road law which created a twofold division of the state's roads. The primary road system comprised about 6,400 miles of road connecting every city and town of more than 1,000 inhabitants in the state, while the secondary road system was made up of the 10,000 miles of the county road system and the township roads, comprising about 87,000 miles. With regard to the primary roads, although the counties initiated and carried out all construction work, the Commission now exercised control over the purse strings as well as over construction plans. A primary road fund was established, composed of Iowa's share of federal aid and the proceeds from the motor vehicle license tax. Counties did not receive the money, but submitted bills for approved projects, which, if passed by the Commission, were then paid by the state.

To meet the demand for a more connected system of interstate highways, Congress in 1921 passed a new highway act which forced drastic changes in Iowa's road administration. The State

Highway Commission was now required to have complete control over both the construction and maintenance of all federal aid roads before aid would be granted. Single counties were no longer to be permitted to block the establishment of continuous paved roads. The states were given five years to comply with these requirements.

Both Governors Kendall and Hammill, together with the Highway Commission and good roads organizations, urged the legislature to make the necessary administrative changes in order that Iowa might not lose federal aid. Governor Hammill admitted that he was "not very enthusiastic about federal aid," yet to abandon it in this case "would be a short-sighted policy." Representative John P. Gallagher of Iowa County, however, called such aid "unwise, dangerous, unpatriotic and openly and offensively antagonistic to the spirit and genius of the American form of state government."

In 1925 a compromise measure was adopted whereby the minimum federal requirements were met. A primary road development fund was established, composed only of federal aid funds and the exact equivalent in state funds, which the Commission was to use, on its own initiative, for primary road construction work. In addition, the Commission was given final authority in determining maintenance policies on primary roads.

Two years later this stopgap measure was replaced with a comprehensive administrative re-

form. Senator J. O. Shaff of Camanche introduced a bill transferring complete control of the entire primary road system to the Highway Commission. In order to secure its adoption, good roads forces had to agree to changes in the Highway Commission. A five-man appointive Commission was created, with the Dean of Engineering at Iowa State College no longer an ex officio member. This terminated the long years of service of Anson Marston, dating from 1904, and broken only by a leave of absence for war duty in World War I.

Prior to the enactment of the Shaff Act the primary road system, Governor Hammill later recalled, had been like a car with two steering wheels. "The Highway Commission had hold of one wheel and the county board of supervisors had hold of the other. . . . Sometimes one of our chauffeurs was looking backward and the other looking forward. We were unable to dodge the mud holes. All we could do was puddle through." By 1929 the process of centralization begun in 1884 was completed. Responsibility for road administration had been removed from the hands of the many and placed in the hands of a few who could more easily be held accountable. Authority over the roads was clearly defined between state and county with the Highway Commission exercising general supervision over all the roads, and direct control over the state's primary highways.

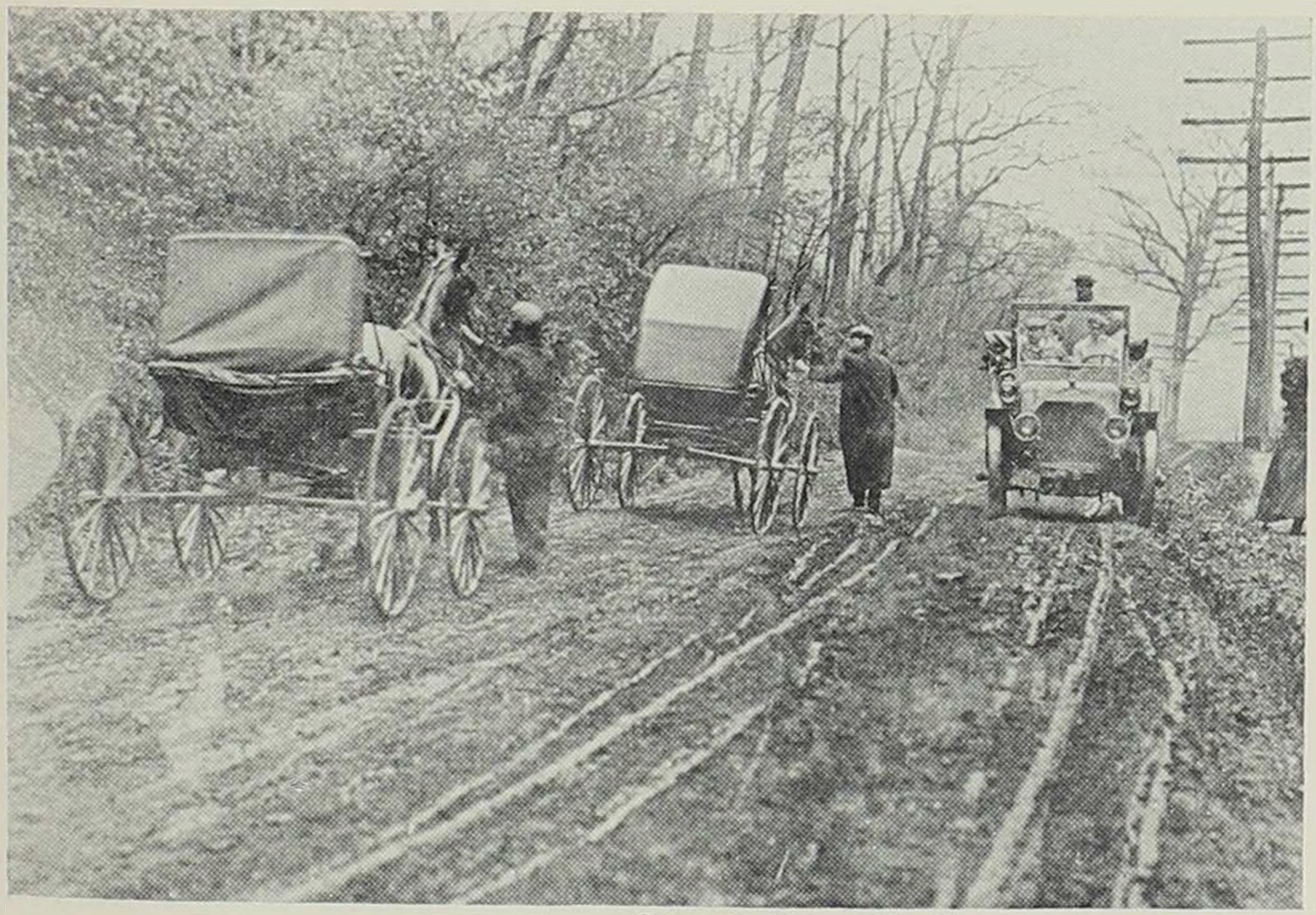
GEORGE S. MAY

Getting Out of the Mud

The automobile revolutionized road making. In 1905 only 799 motor vehicles were registered in Iowa. By 1915 the figure had leaped to 147,078 and in 1925 it had soared to 659,202. By the latter year Iowa had one car for every 3.6 persons in the state, an average surpassed only by California.

Within a span of twenty years road officials had to revise their thinking completely. As Fred R. White pointed out, in 1900 the road maker thought in terms of road traffic of 20 to 30 vehicles per day traveling at no more than eight miles per hour, whereas by 1920 he had to deal with 500 or 1,000 motor vehicles each day at speeds of 30 miles per hour. While a load of two tons was the heaviest conceivable in 1900, trucks in 1920 could haul loads of 10 to 14 tons. By 1920 the roads were challenging the railroads as conveyors of passengers and freight. Thus, roads which had served the needs of Iowans in 1900 were totally inadequate to meet the needs of 1920.

As automobile registrations increased so did the demand for surfaced roads. Until 1910 macadam and gravel were the principal types of surfaced roads. Brick, first used in Burlington in 1887 and widely employed thereafter as street paving, never achieved the popularity for rural roads that it did

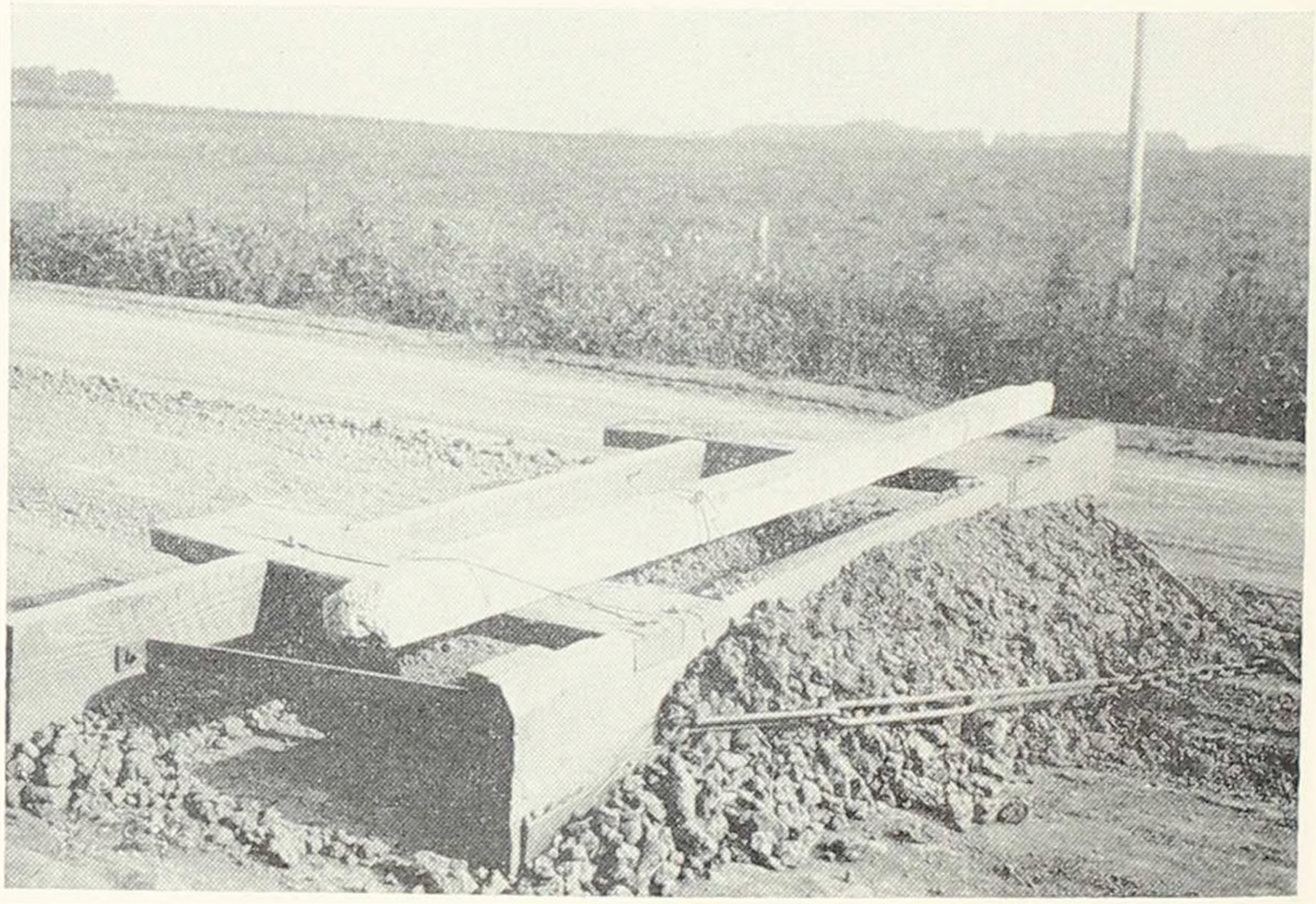


Courtesy Automobile Manufacturers Association

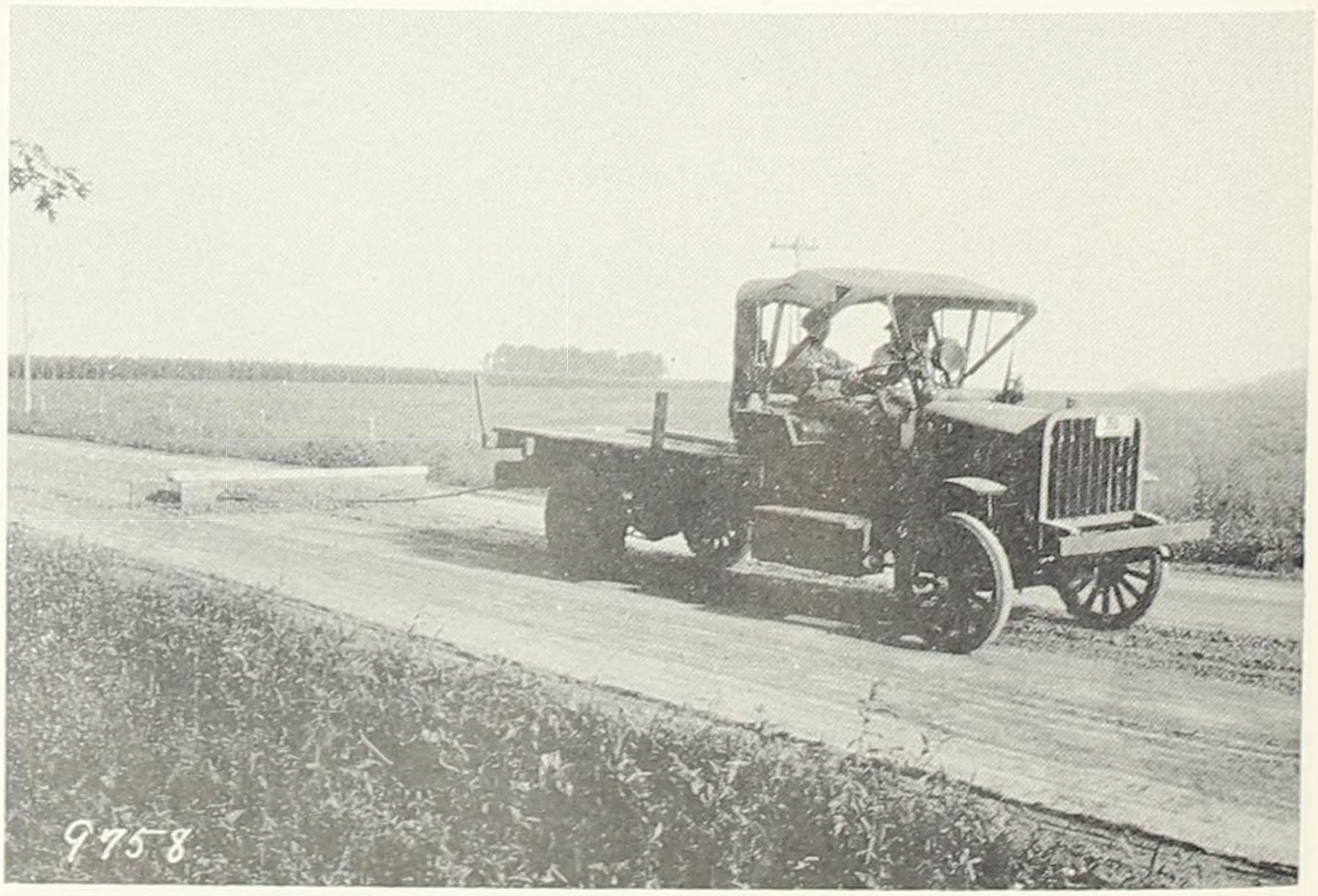
Before the automobile supplanted the horse as the dominant form of road transportation, the law required approaching cars to stop while horse-drawn vehicles were led safely past out of "scaring" distance.

Courtesy Michigan Historical Collections

Henry B. Joy, president of Packard Motor Company, leaving Tama on the Lincoln Highway in May, 1915. Automobiles, such as this one, were helpless without chains on roads which a horse-and-buggy could negotiate.

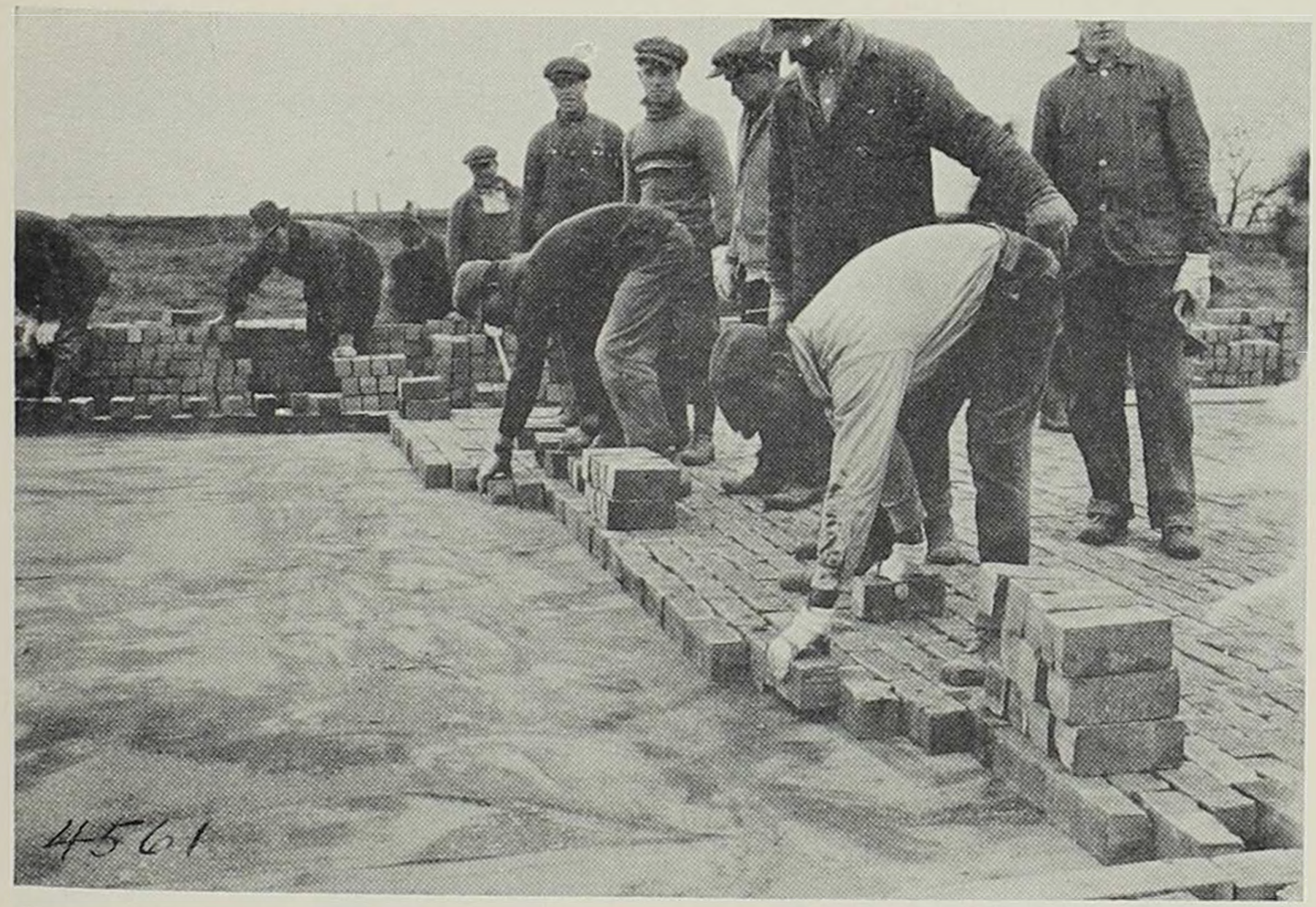


The King Road Drag, popularized in Iowa after 1905 by D. Ward King of Missouri. It is an "improved" model. King preferred to use split logs, rather than the planks used in the drag shown above.

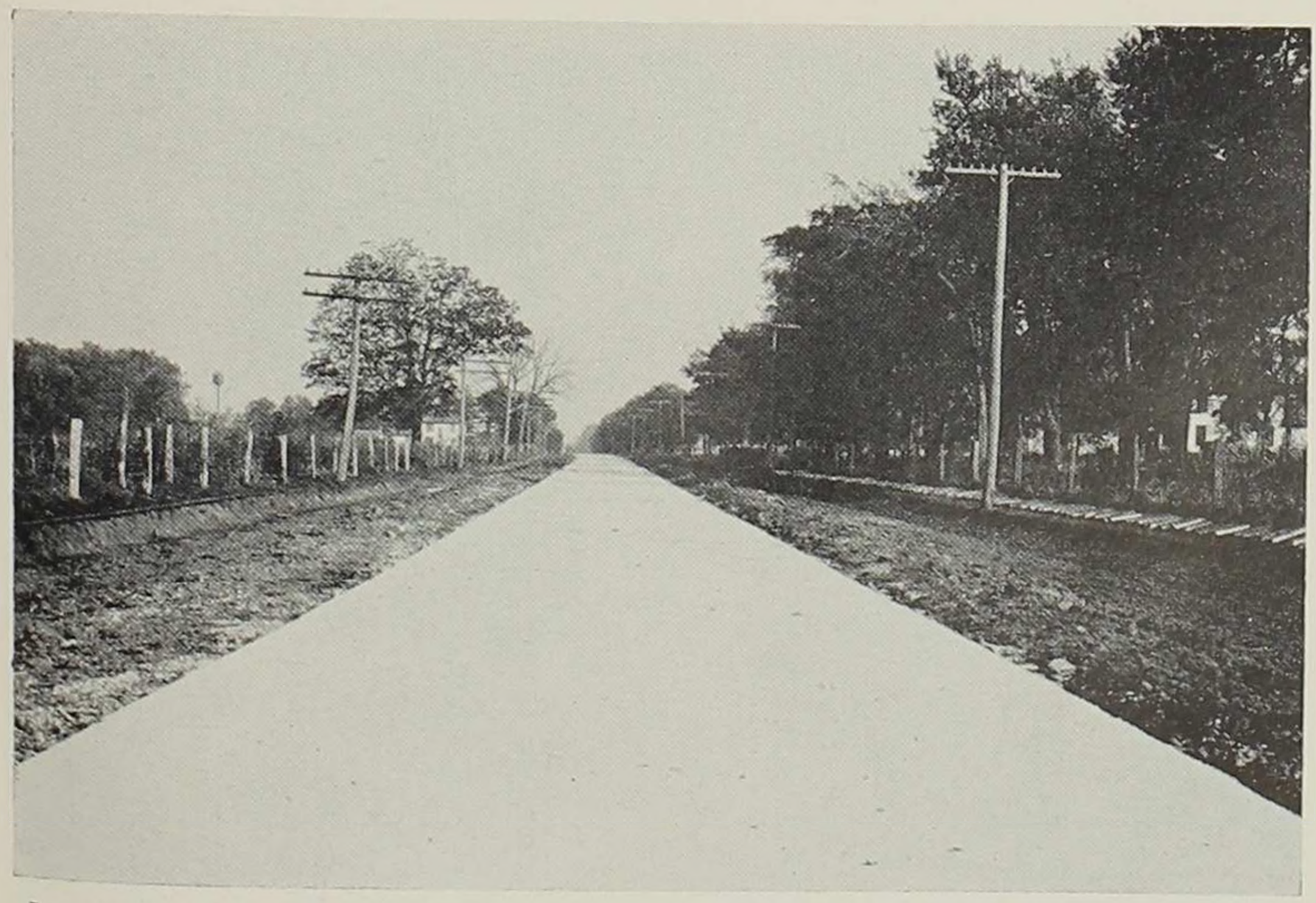


When dragged over a dirt road after a rain, the road drag produced a remarkably smooth surface. Horses were used first, but by the early 1920's maintenance crews, such as this one in Union County, were equipped with trucks.

GETTING OUT OF THE MUD

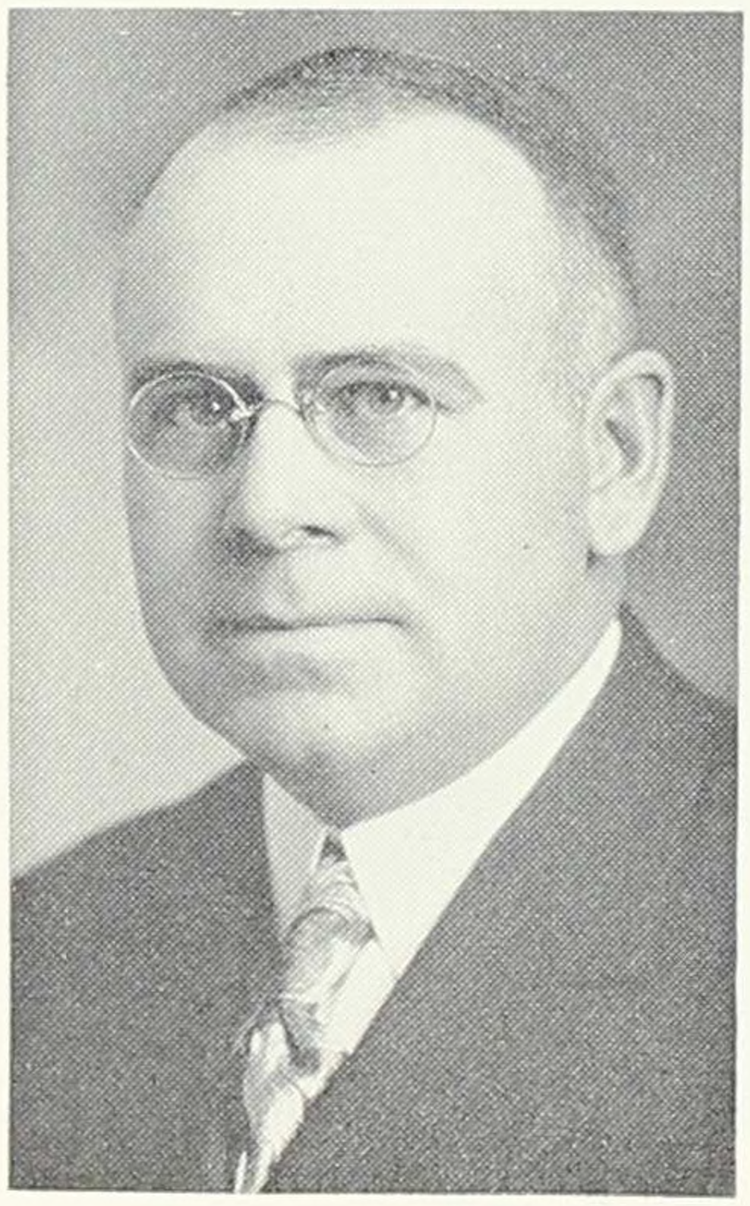


Laying brick on the Des Moines-Camp Dodge road in 1917. Brick was popular as a paving material on Iowa's streets but not on rural roads. Ralph Clover, in the white shirt, could lay 500 feet of 20-foot paving in a day.

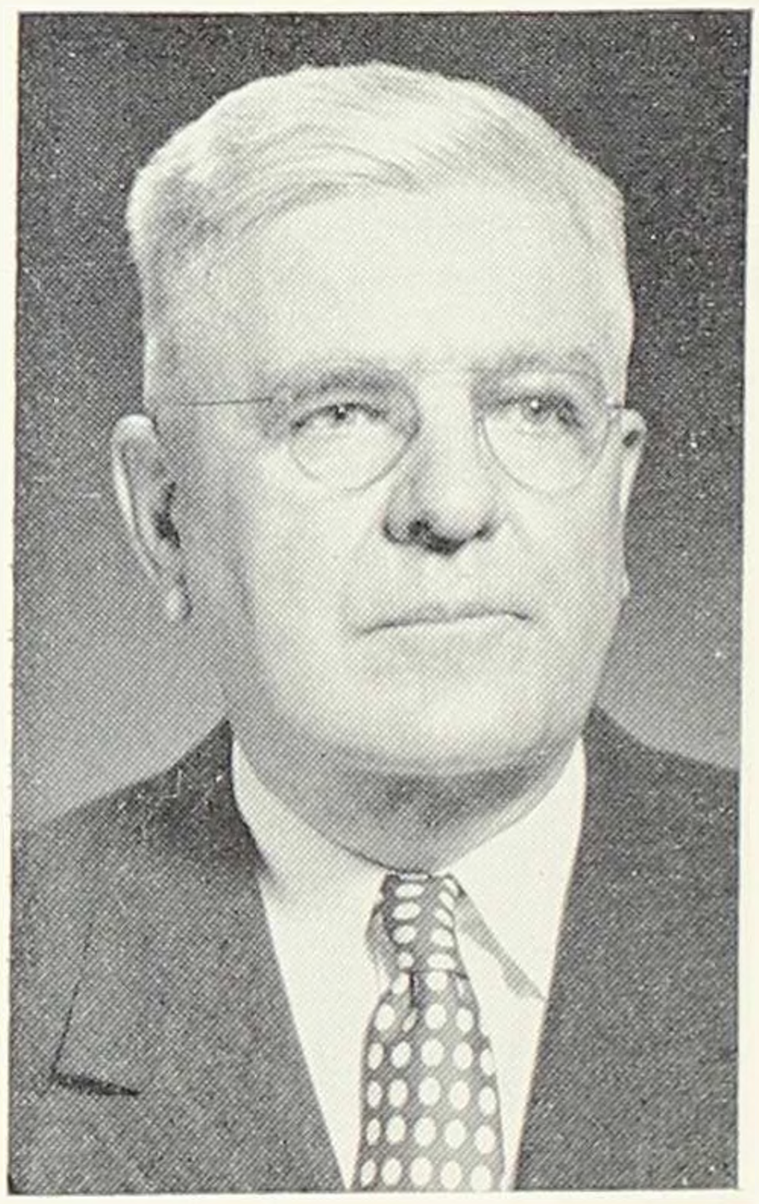


An early Iowa concrete road, built west of Burlington in 1915. Actual paving costs were $1.31 per square yard. Drainage could not be neglected, even on hard roads, as the tile on the side of the road indicates.

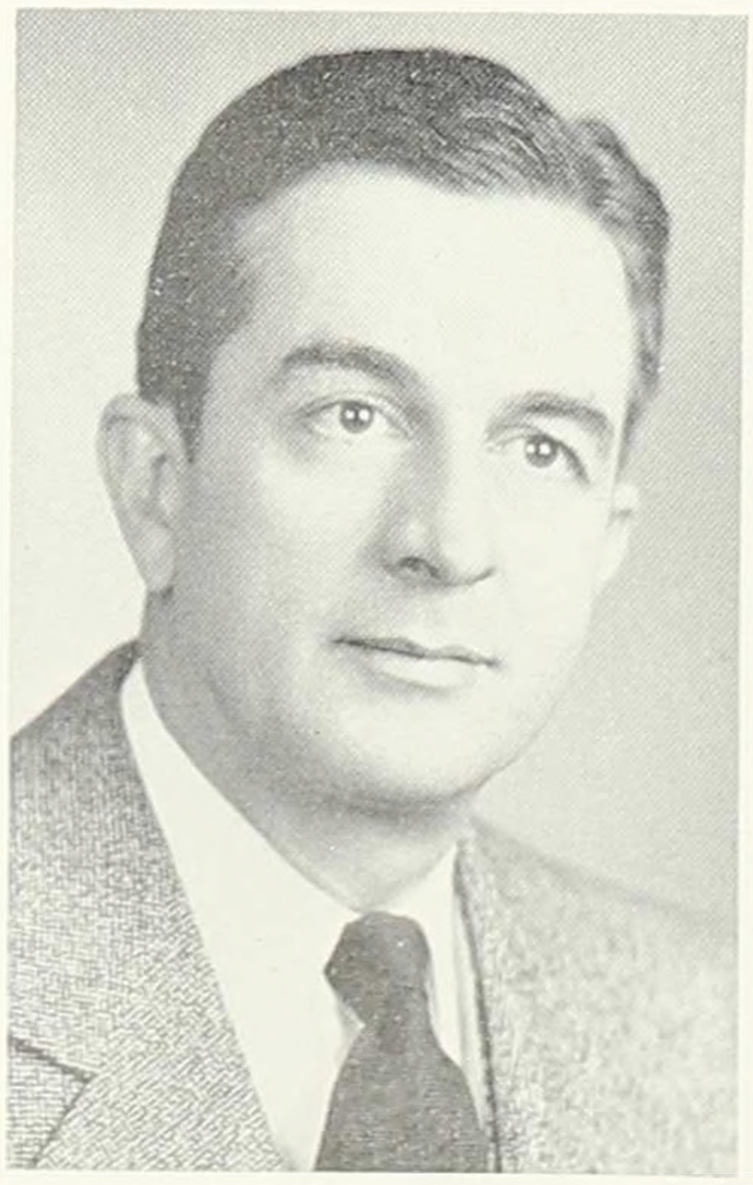
IOWA'S CHIEF ENGINEERS



THOMAS H. MACDONALD
1913-1919

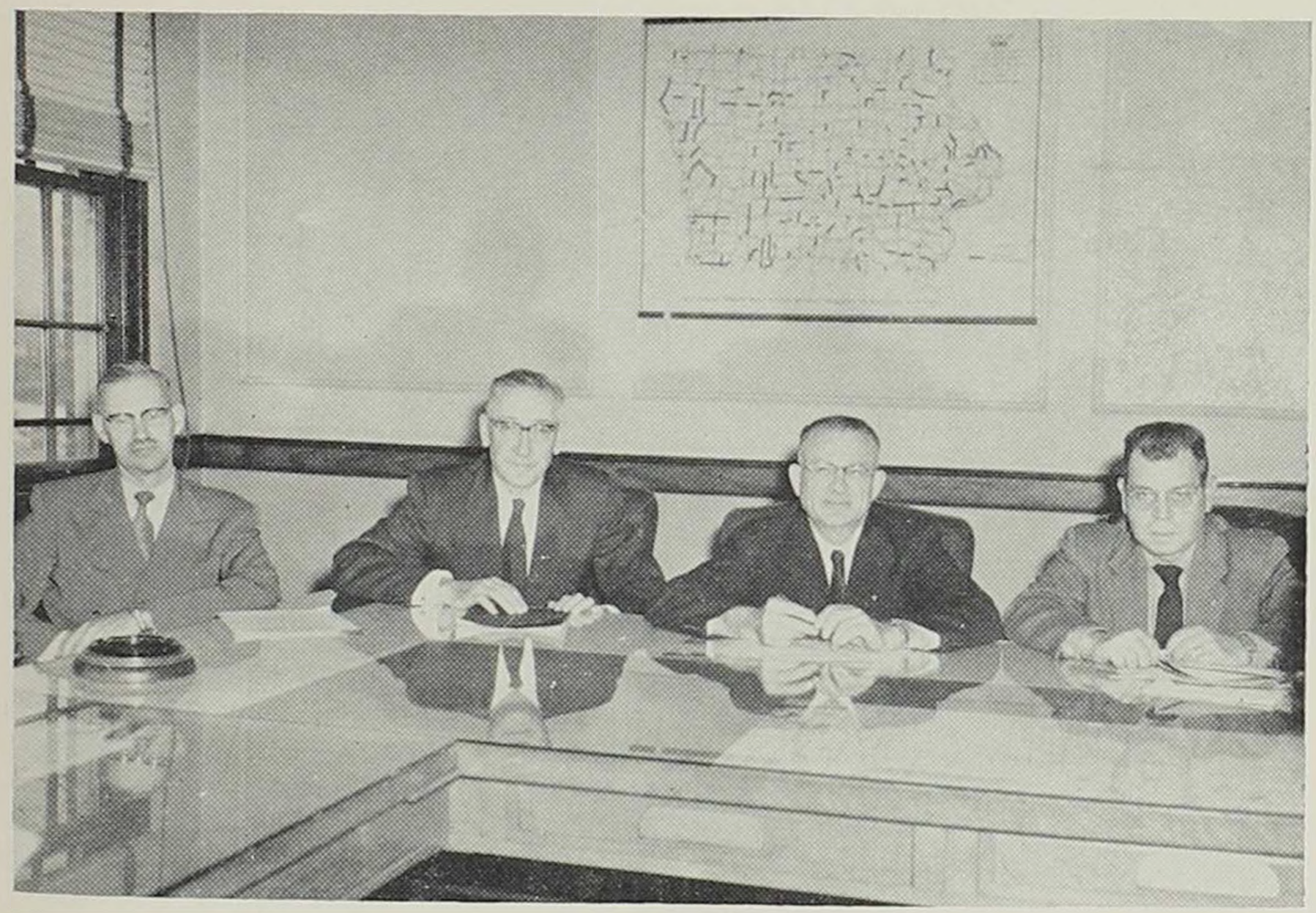


FRED R. WHITE
1919-1952



EDWARD F. KOCH
1952-1954

JOHN G. BUTTER
1954-

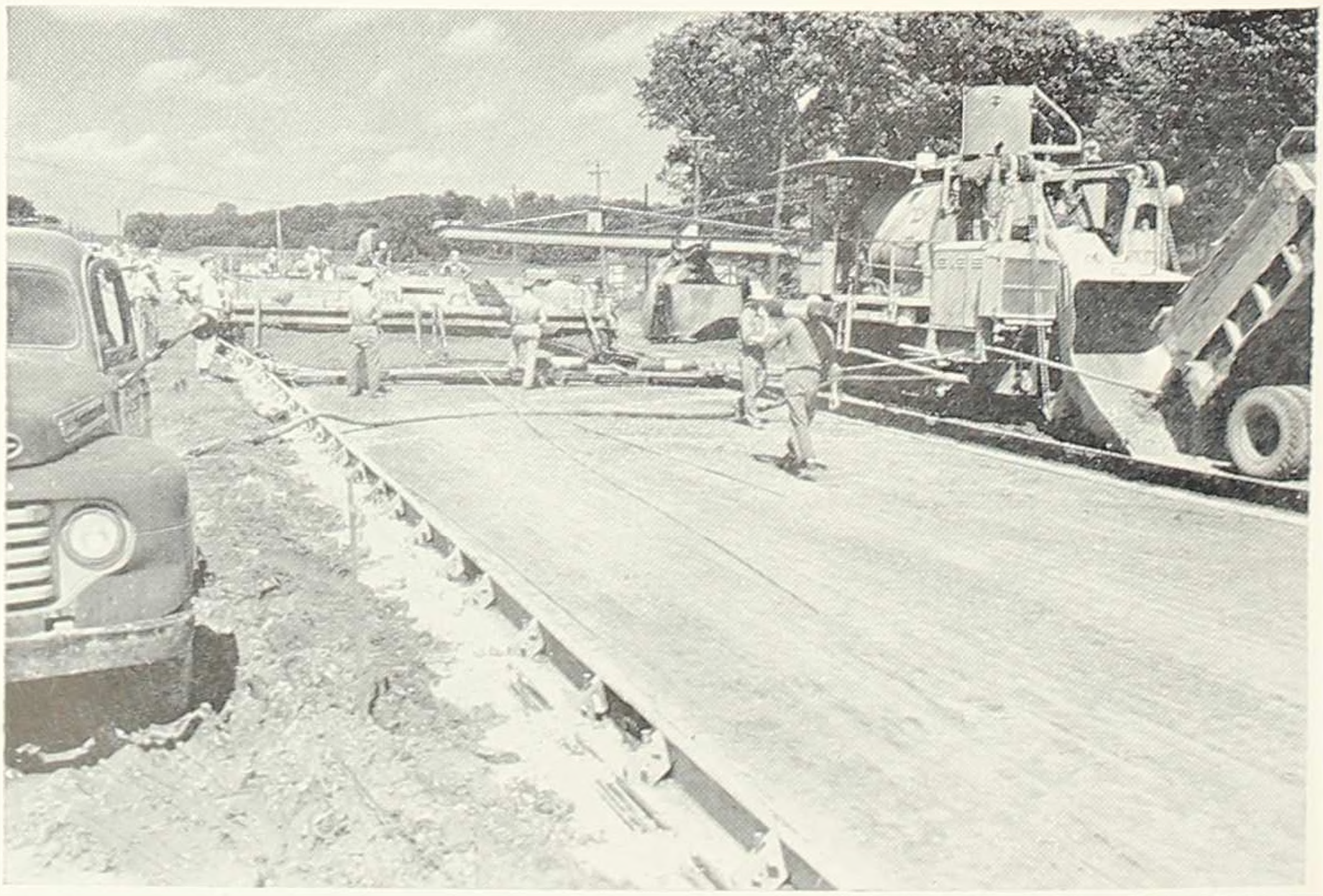


The Iowa State Highway Commission in 1954
Left to right: Robert Keir, Spencer; John R. Hattery, Nevada; Chairman Sanford Zeigler, Fairfield, and Mel Graham, Audubon.
Not present: Frank R. Kerrigan, Dubuque.

Courtesy Iowa Good Roads Association

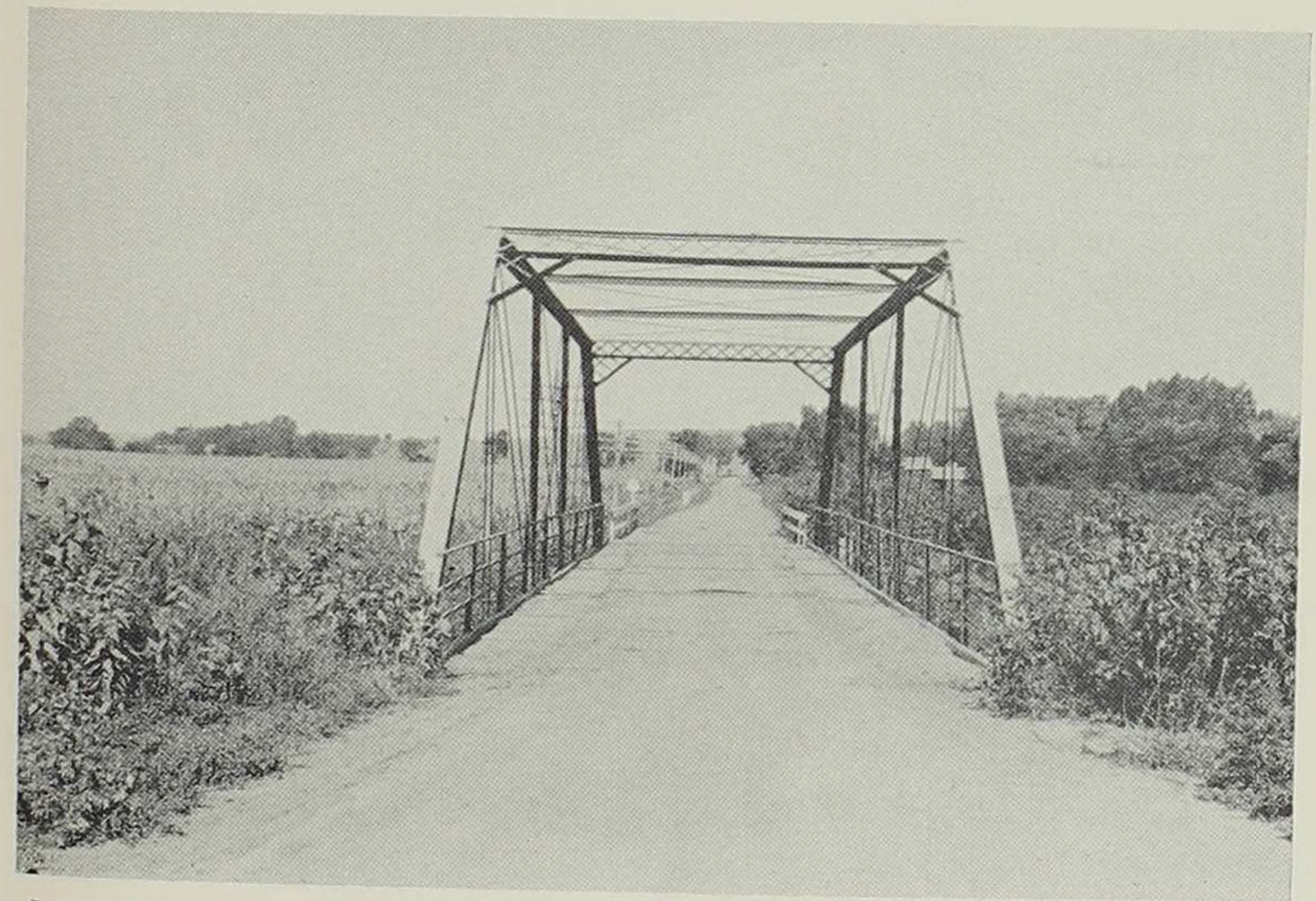
Executive secretary Gerald Bogan, *center*, confers with some leaders of the Iowa Good Roads Association. *Left to right:* F. R. Everds, Estherville; Charles Watts, Pocahontas; T. C. Roderick, Fort Dodge, and James W. Wilson, Carroll.

Road building tools and methods were still in a primitive stage of development in 1915, as indicated by these workmen on the Dubuque-Dyersville gravel road construction project. This was Iowa's second road to receive federal aid.

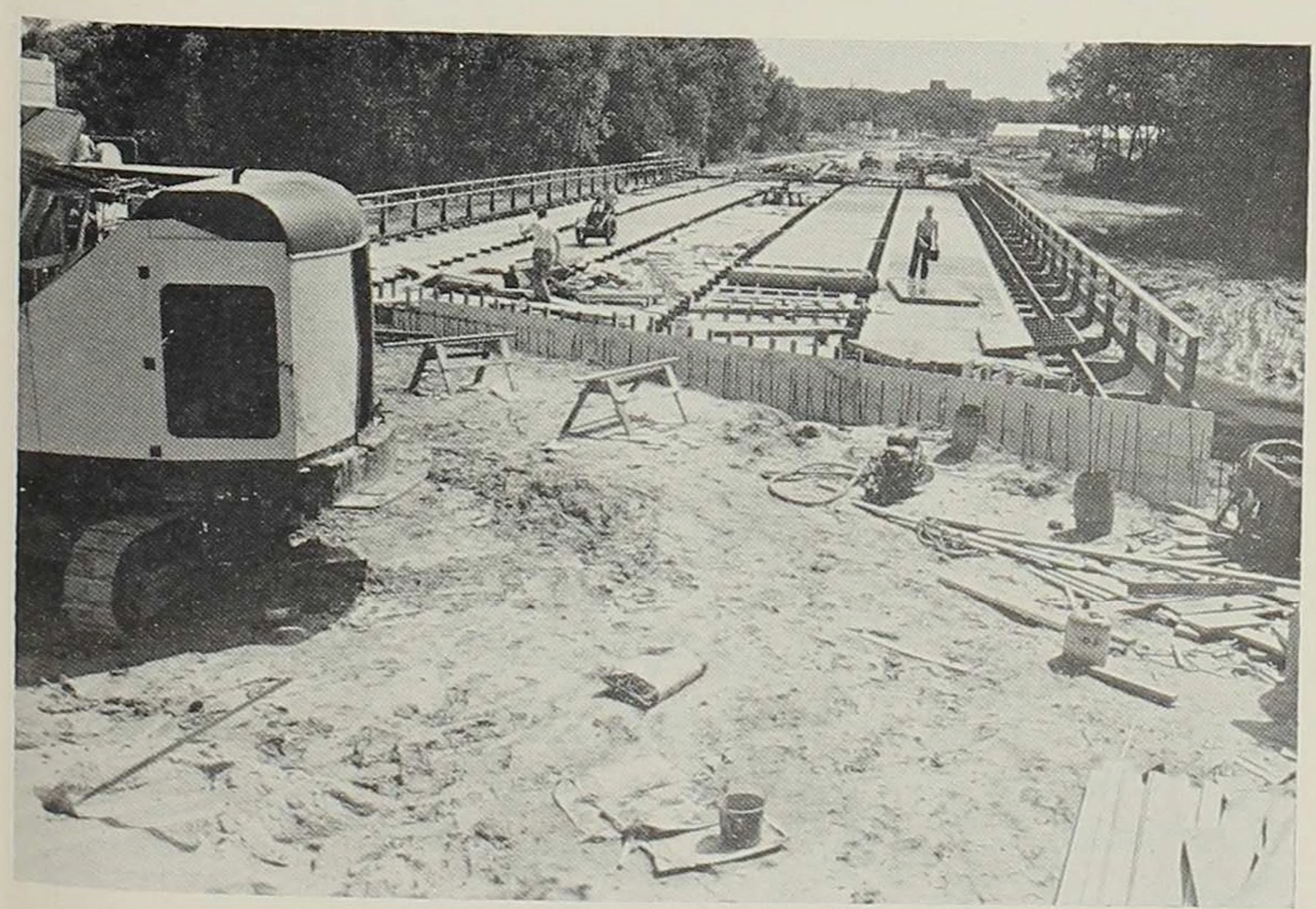


Courtesy Iowa City *Press-Citizen*

The multitude of equipment used to pave a section of Highway 6 west of Iowa City in 1951 provides a vivid example of the complexities of modern road work.



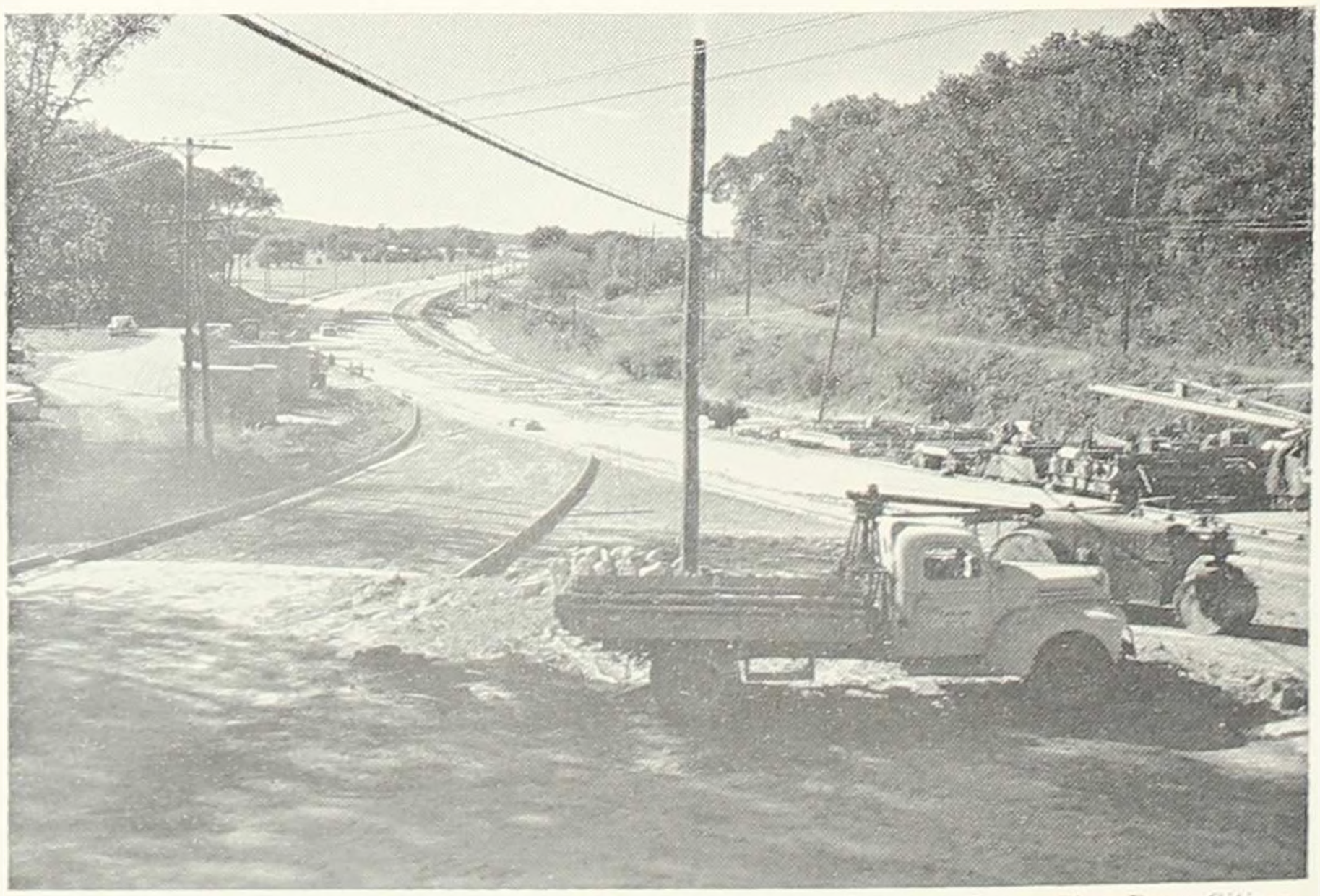
A narrow bridge on the Lincoln Highway near Dow City in the early years of the twentieth century. Note the wooden planking.



Courtesy Iowa City *Press-Citizen*

A modern four-lane, re-inforced concrete bridge in the process of construction across Clear Creek on Highway 6 west of Iowa City in 1951. Built at a cost of $118,249, the bridge is 210 feet long and 52 feet wide.

Typical of the paved roads built in the 1920's and early 1930's is this 18-foot highway near Guthrie Center. The paving cost about $30,000 per mile.



Courtesy Iowa City *Press-Citizen*

The highway needs of the 1950's demand many more miles of 24-foot, four-lane highways such as was built on Highway 6 between Iowa City and Coralville in 1951. Construction expenses were in excess of $100,000 per mile.

in many eastern states. Various forms of asphalt pavement, however, first used in Iowa by Des Moines, Cedar Rapids, and Marion in 1901, have been used on a large scale on rural highways.

The difficulty with macadam and gravel roads was in obtaining materials. If macadam roads were the only answer to Iowa's road problem, one observer declared in 1893, "there is a large part of Iowa which can hope for no improvement for many years to come." Outside of a few areas in eastern Iowa where stone was more plentiful, the macadam road was not a factor in pulling the state out of the mud. The discussions of early Iowa good roads enthusiasts, however, indicated that macadam was considered the ideal surfaced road.

The automobile quickly changed that opinion. Before the advent of the motor vehicle the stone dust which served as the binder for the stones in the macadam road was ground in by the steel tires of the horse-drawn vehicles. The automobile, however, Anson Marston explained, "sucks out the binder and loosens the stones, and . . . tears the road to pieces rather than bind it together." Iowa, in fact, was fortunate that it could not build many miles of macadam road, as New York did, only to find it necessary to spend prohibitive amounts of money to maintain them under the pounding of motor traffic.

Iowa's gravel supply was better than its stone. Northern and eastern Iowa were blessed with

more gravel than the rest of the state, but by 1928 only seven counties had been found to have no source of gravel at all, although the supply in eleven others was nearing exhaustion by that date. Iowa's gravel, however, tended to be inferior to that of some other states, lacking the natural binder which made New Jersey's gravel roads famous. Nevertheless, around World War I many felt that gravel offered the best solution to Iowa's road problems. Gravel has proved practicable for surfacing side roads, but on main highways heavy maintenance costs have ruled out its use in favor of concrete, which has become the preferred type of surfacing.

The use of concrete pavement on a large scale is relatively recent. The nation's first such pavement was laid in Bellefontaine, Ohio, in 1893-1894. Not until 1904, however, did concrete paving begin to achieve any degree of acceptance. Its popularity soon grew with amazing rapidity. Where there were only 364,000 square yards of concrete pavement in the entire country in 1909, by 1914 the figure had increased to an estimated 19,200,000 square yards.

A half block paved at Le Mars in 1904 seems to have constituted the earliest use of concrete paving in Iowa. Not until 1909, when 6,000 square yards were laid in Mason City and Davenport, was any substantial quantity built. By 1912, concrete, which only three years before had ranked at the

bottom of the list, was far and away the most popular paving material in Iowa with a total of 316,279 square yards laid during the year.

The first rural concrete pavement was built in 1911 near Eddyville on a quarter mile stretch of deep sandy road which had long been a bottleneck for farmers. Businessmen of Eddyville contributed several hundred dollars to the project, farmers supplied the labor, and the Mahaska County Supervisors donated $500 worth of cement. A roadway fourteen feet in width was laid under plans drawn up by the State Highway Commission. At the prevailing rates the road cost $1.02 per square yard, about a third of what a similar paving job would cost at the present time. Forty years later this road was still in usable condition.

A mile of concrete was laid west of Mason City in 1913. By 1915 it extended into Mason City, and in 1917-1918 the eleven miles from Mason City to Clear Lake were completed, constituting Iowa's first interurban concrete highway. A dedication ceremony was held, with speeches at Mason City, followed by a parade to Clear Lake. At the halfway point a few shovelfuls of dirt were removed from the pavement, symbolizing the end of dirt road connections between the two towns.

The chief importance of the early paved roads, once their ability to withstand use was proved, was to stimulate a desire for more such pavement. In 1918 Linn County built a "seedling mile" of

pavement on the Lincoln Highway six miles east of Cedar Rapids, and the same distance southeast of Marion and northwest of Mount Vernon. This location was chosen because it was felt that it would be easier to obtain money to pave the road into one of the towns. The "seedling's" limited practical value was demonstrated when, in December, 1918, J. W. Eichinger, editor of the Highway Commission's *Service Bulletin*, asked County Engineer R. W. Gearhart if they could drive over and take some pictures. "Drive!" the engineer replied. "Man! We'd have a time getting through the mud with a team. We couldn't possibly get to the pavement with a car."

Once the practicability of concrete roads had been tested the question of their expense became the important one. By the 1920's the cost of the average concrete pavement built in Iowa was around $30,000 per mile, a figure which has since risen to $100,000. Bankruptcy, many asserted, would be the only result of an attempt to pave many miles of Iowa's roads.

Advocates of concrete paving were able to cite the maintenance costs of concrete which were lower than any other type of road and eventually would make paved roads the least expensive. Tests conducted by the Highway Commission, Iowa State College, and other engineering groups during the 1920's showed that it cost an average of 2.6 cents less per mile to operate a motor vehicle

on a paved road than on a dirt road. Other tests showed that tires wore out five times faster on gravel than on concrete. Such figures indicated, the Commission contended, "that vehicle operating expenditures by private individuals and not road-building costs paid from public funds are the big item of expense in Iowa's annual transportation bill." The savings in operating expenses gained from paving the more heavily traveled highways would be sufficient to pay the cost of that paving within a few short years, even if one disregarded the other savings such roads would bring. In short, good roads enthusiasts argued, Iowa couldn't afford not to build hard roads.

In addition to enormously stimulating the demand for surfaced roads, the automobile also provided a means of financing those roads. Before the automobile the only practical means of providing the money for the expensive macadam road improvements advocated by many good roads leaders was through increased taxes on the property abutting the road.

In the pre-automobile era there was some justification for treating road improvements as a matter of interest chiefly to the local residents. But with the coming of the automobile, Governor Hammill observed in 1925, a road was no longer "a neighborhood or town road, but a county, a city, a state, a national highway, used by everybody from everywhere. Under these changed conditions it is

simply common sense and common fairness to say that the people who use the roads and get most of the benefits from them, the motor vehicle owners, should pay a share of the cost." Through the automobile license fee and the gas tax the automobile provided two reasonably painless means of financing road improvements. By 1927 the last of the special property taxes assessed to help pay for primary road improvements was repealed.

The motor vehicle license tax was introduced in 1904 when a one-dollar registration fee was required for each vehicle. Later, in 1911, the Kulp bill increased the fee to fifteen dollars, and provided that 85 per cent of the proceeds would be distributed to the counties who were to use it for improving rural roads. In 1917, however, the necessity of matching federal highway funds compelled the legislature to order that an amount equal to Iowa's annual share of those funds be taken out of the motor vehicle license revenues.

In 1919 the licensing regulations were revised to make the fees correspond more closely to the price and weight of vehicles. The owner of a $6,400 Pierce-Arrow now paid a fee of $82.40, while the owner of a $525 Ford paid only $12. This revised tax was expected to yield as much as six million dollars a year, and Highway Commission officials hopefully declared that this would pay for most of the hard-surfaced roads in the state in the coming years. Actually, by 1921 the

motor vehicle license revenue had risen to $7,719,-127, a sum which contrasted remarkably with the $65,608 raised in 1910, yet was less than a third of the total income from road taxes. The remaining two-thirds was supplied chiefly by county and township property taxes.

In its annual report for 1922 the State Highway Commission recommended that a tax be levied on gasoline for highway construction and maintenance purposes. Eighteen states at this time had such a tax with ten placing the money in a general state road fund. The legislature in 1923 authorized a two-cent tax on every gallon of gasoline or other petroleum products suitable for generating power, with the exception of kerosene. At the same time county and township road taxes were to be abolished. Governor Nate Kendall vetoed the measure, calling the levy a "plain and palpable sales tax." Despite the ending of other road taxes, he felt a gas tax was too great a burden for the people of the state to bear. The bill's most serious defect, however, was that it made no provision for exempting those who used gasoline for heating purposes or for generating light and power.

Kendall's successor, John Hammill, and the Good Roads Association renewed the fight for a gas tax in 1925. "Under the present law," the latter group argued, "the man who drives ten thousand miles per year, pays no more into the road funds than the man who drives a similar vehicle

5,000 miles per year, yet he gets twice the service and does twice the damage to the roads." Furthermore, the gas tax was the only way in which the increasingly numerous out-of-state motorists could be made to pay for the use of Iowa's roads. The legislature again passed a two-cent gas tax, but provided refunds on all gasoline used for purposes other than moving vehicles on the roads. Governor Hammill had requested a three-cent tax, half of which would go into the primary road fund and half for secondary roads. The legislature, however, divided its two-cent tax equally among the primary, county, and township roads. Two years later the General Assembly increased the tax to three cents, the additional cent going entirely into the primary road fund.

Total receipts in the primary road fund during 1928 were $14,604,521. By itself, this sum could not build paved roads at the rate desired by the majority of the people in the state. This raised a fundamental question: should Iowa's roads be built only as fast as the revenue permitted, or should construction be accelerated with bonds.

As early as 1894 Governor Frank D. Jackson advocated the pay-as-you-go plan of road construction. "The burden of expense in a single year ought not and need not be a heavy one," he declared. "Each succeeding generation of people, at no burdensome expense to themselves, can leave to their successors a few miles of permanent roads as

a just and proper legacy." The opponents of this plan have always contended that it is much too slow and costly because of the economic losses inflicted by poor roads.

In the 1880's and 1890's Edward H. Thayer and Samuel D. Pryce favored road bonds as the best method of building surfaced roads. "To do this," Thayer admitted, "a great many people will have to conquer their prejudices and listen to a kind of reason and argument that they turn from now with a solemn shake of the head and the exclamation 'no bonds if you please, and no debt for road building.' " But why not? Thayer inquired. Business firms and farmers were continually borrowing money to make needed improvements, while bonds had been issued to finance public works. "Debt has made America what it is," Thayer argued. "The business of civilization is transacted on the credit system."

The theory behind road bonds is that by anticipating income and building good roads quickly with the funds obtained from the sale of bonds the saving in decreased maintenance costs plus the economic benefits which improved roads will bestow upon those who use them will be more than sufficient to pay the principal and interest on the loan. Improved roads, it is further contended, will benefit future generations, as well as the present, and thus both should pay their share of the cost.

As most states began adopting road bond plans

the demand for similar action grew in Iowa. In 1912 the Good Roads Association recommended "that our coming legislature test the sentiment of our people by submitting at the next general election the question of issuing bonds for road improvements." Until the mid-1920's most of the discussion centered around permitting the counties to sell bonds, although a $25,000,000 state bond issue had been strongly advocated by Harvey Ingham in the columns of the Des Moines *Register and Leader* in 1912.

In 1914 the Republican party gave guarded support to bonds when its platform recommended "that our road laws should be so further amended as to permit the several counties to finance public road improvements in a similar way as court, school houses and other public works are financed." The following year Governor George W. Clarke, noting the support which had arisen for road bonds, expressed his approval and recommended legislative action. In addition, he appointed a commission, headed by D. W. Norris, Jr., Marshalltown editor, to prepare recommendations as to the legislation needed to build permanent roads. Early in 1916 the commission reported that it favored "the issuance of county bonds . . . so as to build a road that will not wash away at every rain." It believed that "the people of Iowa can be trusted, at least with their own money."

Road bonds were a major issue in the heated

political campaign of 1916. E. T. Meredith, who had been a member of Clarke's special commission, was the Democratic candidate for governor and received the support of such normally Republican papers as the Des Moines *Register* partly because of his support of road bonds. On the other hand, William L. Harding, the Republican nominee, was widely referred to as the "mud roads" candidate because of his failure to support bonds. The bond forces were led by the Greater Iowa Association together with such groups as the Greater Des Moines Committee and the Iowa Bankers Association. Opponents asserted that most members of these "self-appointed committees and associations . . . do not pay any road tax, and that the burden of paying for these bonds will be placed upon the farmers of Iowa." Harding declared that the voters were asked to approve "long-time indebtedness . . . for extensive work in experimental road building."

Actually, bond supporters contended, all they desired was that the voters in each county be permitted to express their opinion on whether they should adopt a method successfully used elsewhere to build roads. "Is there anybody anywhere that has not been benefited or who has not profited by the anticipation of revenues by the great business enterprises of the country?" Governor Clarke asked. "Why fear to apply the principle here, applied everywhere else? . . . If there

is nothing compulsory about it what can be the objection?"

According to Harding, however, his victory meant that "the voice of the people" had spoken in "no uncertain tone" against the issuance of bonds, "and for making our road improvements out of funds previously raised by normal taxation, and in such manner and to such extent as should be determined by those who must furnish the money to pay for them."

The sale of millions of dollars of Liberty bonds in the state during World War I changed the minds of many people, who agreed with the Rev. A. H. Cooke of Des Moines that "it ought to be as easy to issue bonds for good roads as it was for war." At a conference in January, 1919, called by the Greater Iowa Association in Des Moines, representatives of the Farm Bureau Federation, Federation of Women's Clubs, Bankers Association, Manufacturers Association, League of Commercial Clubs, organized labor, Ministerial Association, Retail Clothiers Association, United Commercial Travelers, and other groups supported county road bonds. As a result, the primary road law authorized counties to issue bonds to speed the construction of hard-surfaced primary roads. The principal would be paid out of the county's share of the primary road fund, the interest by a special county property tax.

The legislation of 1919 marked the beginning of

the great construction program to get Iowa's main highways out of the mud. Fred R. White called it "the biggest engineering undertaking this country has attempted for some time." From 1913 to 1919 Iowa had made greater progress than probably any other state in the construction of permanent concrete bridges and culverts. In addition, although Iowa was far behind its neighbors in the amount of paving laid, the work of building the roads to permanent grade, which the Highway Commission insisted must precede any surfacing, advanced at a much greater pace. Thomas H. MacDonald declared in 1917 that Iowa "may be behind just yet in surfacing but when she starts, she will be in shape to make exceptional strides."

During the first half of the 1920's the number of ungraded miles of primary road was reduced from nearly 5,000 in 1919 to less than 1,500 by 1926. The increase in paved mileage, however, was disappointing. From a start of 25 miles of pavement in 1919 only about a tenth of the primary road system had been paved by 1926. In 1919 and 1920 the delay was attributable to shortages of material and manpower as a result of unsettled post-war economic conditions. After that the difficulty was a shortage of money.

The county bonding plan of 1919 failed to produce the funds anticipated. After an initial burst of activity in 1919 stirred up by Joe L. Long of the Greater Iowa Association, which saw thirteen

counties authorize a total of $18,475,000 in bond issues, no counties voted in favor of bonds until 1926. By 1925 primary road funds had dropped to a point where construction would have to be cut by two-thirds unless additional funds were provided. If this was not done, Governor Hammill declared, "few men now past their majority will live to see a connected system of highways covering this state." Furthermore, most of the work which had been accomplished was not spread evenly over the state. By 1926, one-fourth of the counties, in the northern part of Iowa where conditions were most favorable, had surfaced all their primary roads, but in 60 per cent of the counties no surfacing had been accomplished.

Several actions were taken to meet this situation. The two-cent gas tax was introduced, but the one-third allotted to the primary road fund amounted to only $1,575,000 in 1926. The Highway Commission in 1926 announced a three-year stopgap program to provide gravel surfaces for 2,700 miles of the primary road system. Although it admitted that later much of the mileage would have to be re-surfaced with concrete its program was a means of getting Iowa out of the mud as soon as possible.

In addition, there was renewed bond activity. With Johnson County setting the example, vigorous campaigns by local good roads groups resulted in twelve counties voting in favor of bond issues

VOTE YES

MARCH 16

You are now paying in auto license fees and gas tax enough to get paved roads; but are still pulling through mud.

Other Counties In The State

are getting about 20% of your money to improve their roads. Here is a plan to beat them to it.

VOTE YES

MARCH 16

A million dollar bond issue will enable you to anticipate your license fees and gas tax over a period of 19 years and in the meantime you can

RIDE ON A PAVED PRIMARY ROAD

Enjoy Life While You Live.

Courtesy W. J. Smith

A poster which helped sell Wapello County on the desirability of authorizing primary road bonds in 1926.

during 1926. In 1927, the Shaff Act, by assuring counties that all obligations arising from primary road bond issues would be paid out of the primary road fund, greatly encouraged further bond issues. As a result, 33 counties authorized bonds during 1927, bringing the total amount approved since 1919 to $63,685,657.

Meanwhile, support for a state bond issue had grown. Groups like the Good Roads Association argued that road development with county bond issues resulted in disorganized, patchwork construction. A few counties that refused to approve road bonds could block the completion of hard-surfaced roads across the state or between important cities. Only through a state bond issue could a state-wide network of connected modern highways be achieved. Even after the Shaff Act gave the Highway Commission authority to use the primary road fund wherever it wished, the Commission felt obligated to use funds from primary road bonds in the counties which had voted for them.

By 1928 the demand for a state bond issue was so great that Governor Hammill called a special session of the legislature in March. Although he had earlier expressed disapproval of state road bonds, he now strongly supported them. The legislature submitted to the voters in the general election of November, 1928, a $100,000,000 state bond proposal. No more county bonds would be sold, and those already issued would be called in

and replaced by 20-year state bonds. Since no more than $100,000,000 in bonds could be outstanding at any time, this meant, the proponents of the plan declared, that the state's bonded indebtedness would be increased only about $34,000,000 after the county bonds had been absorbed. The bonds were to be redeemed from the motor vehicle license fees and the gas tax, which, at the 1928 levels, would provide ample funds to pay for the debt and maintenance of the completed system.

With the money from the state bond issue the primary road system would consist of nearly 5,000 miles of pavement and 1,700 of gravel by 1934, ten years sooner, it was contended, than with county bonds. The Farm Bureau Federation objected that "the state will have to pay as interest . . . the staggering total of $66,000,000 for which it receives nothing except that the completion of the program is advanced eight or ten years." John F. D. Aue, president of the Good Roads Association, retorted that this was precisely the point of the bond issue. By speeding up the completion of the primary road system, Aue maintained, reduced operating expenses on paved roads would save drivers of motor vehicles $14,000,000 more than the interest on the bonds.

The bond proposal was approved by a 2 to 1 majority in November, 1928, but the following March it was declared unconstitutional. The legislature had provided that the bond act would not

be operative until tested in the courts. The Iowa Supreme Court ruled that the provision that the last bond would not be retired until 26 years after the first had been issued violated the constitutional requirement that state debts must be retired within 20 years. Furthermore, the attempt to pledge license fees and the gas tax during the life of the bonds was ineffective since "the constitution confers upon the legislature no mortgaging power over future resources, other than the proceeds of a direct tax."

The decision did not prove to be as serious a setback to the primary road program as was at first feared. An attempt was made to amend the constitution to make state bonds possible, but, in addition, the legal limit of a county's bonded indebtedness was raised. This stimulated 18 counties which had already issued bonds to vote additional bonds totaling $12,200,000 during 1929, while 18 others voted new issues totaling $21,080,000. Thus, over $33,000,000 was authorized in 1929, which was virtually what the state could have raised had it been permitted to go ahead with its bonding plans. Eventually every county except Louisa voted for bonds, with a total of $118,186,000 being obtained by this means from 1919 to the end of the 1930's. By November 1, 1950, all bonds had been retired.

The increased funds made available after 1926 quickly accelerated the paving of primary roads.

In both 1928 and 1929 approximately 700 miles of pavement were laid, more than had existed in the entire system in 1926. The year 1930, however, was the peak year of construction in the entire history of Iowa's roads. A thousand miles of concrete were laid, with primary road construction costs for the year reaching $42,600,000. For the first time it became possible to travel from Des Moines to all ninety-nine county seats on surfaced roads. Whereas three years earlier only three roads across the state had been completely surfaced, by the end of 1930 seven east-west and two north-south surfaced highways spanned the state.

The exhaustion of the road bond funds and the effects of the depression forced a sharp reduction in work on the primary roads following 1931. Despite this, by 1934 the state was within 690 miles of the goal set by the defunct state bond program. An additional 324 miles had been blacktopped, a method of surfacing cheap to lay but expensive to maintain, first introduced in 1932. In large, bold type the Highway Commission proudly declared on its 1931 primary road map: "Motorist, Get This, Once for All — IOWA IS NO LONGER A MUD ROAD STATE!"

GEORGE S. MAY

Post-War Road Problems

The many miles of concrete paving laid by 1932 did not, as many seemed to think, solve Iowa's road problem. Since that time road officials have sought to prevent the primary roads from becoming obsolete, while, at the same time, providing more adequate secondary roads.

The depression of the thirties sharply reduced road receipts. The primary road fund's income dropped from $18,116,000 in 1931 to $14,514,000 in 1934. After bank closures in 1933 tied up over half the available funds, no primary road contracts of any magnitude could have been let that year without increased federal aid. In 1935 and 1936 the Highway Commission still relied upon federal help to provide two-thirds of the money it spent.

In 1940 the Commission reported an urgent need for extensive primary road improvements. Since 1920 motor vehicle registration had increased from 437,000 to 790,000. During this same period the average cruising speed and mileage traveled had doubled. Buses and trucks presented problems in 1940 that had not existed in 1920. Curtailment of railroad service left many small towns entirely dependent upon highways to meet their transportation needs. The Commission,

therefore, proposed to spend at least $116,000,000 in order to modernize the primary road system.

Before any action could be taken, World War II intervened, virtually halting all road construction. In the year ending June 30, 1945, less than $600,000 was spent on primary road construction, the smallest amount in the history of the system. The normal maintenance force of 1,400 men was reduced to 971 by June, 1945. Equipment which would ordinarily be replaced had to be repaired and used again. Some relief was gained through the reduction of highway traffic by nearly one-half during the war.

It took years following the war to reorganize and equip the highly trained engineering and construction forces built up in the 1930's but scattered by the war. Critical shortages of materials halted construction for months at a time. The wartime cut in construction left a surplus of almost $13,000,000 available for the primary roads, in addition to the annual income. At the same time, however, inflation forced the costs of such items as standard concrete pavement up from $1.95 per square yard before the war to a peak of $4.23 in 1948. Maintenance costs rose from an average of about $4,000,000 in 1940-1944 to nearly $7,000,000 in 1949, and yet the Commission admitted that the general condition of the roads did not improve.

Road work was also delayed by arguments between supporters of the primary and secondary

road systems. The fact that over 90 per cent of the roads were secondary made it appear that they should receive the most attention. In reply, primary road supporters pointed out that at least 60 per cent of the state's highway traffic was on the primary roads. Unless the main highways were in good condition, they argued, the side roads could not adequately fulfill their chief function as primary road feeders.

During the 1920's, as a result of the haste to pave the primary roads, the complaint that not enough was done on the secondary roads was justified. By 1929, however, Governor Hammill optimistically declared, "We may now consider our primary road problem solved and turn our undivided attention to the solution of our secondary road problem." Whereas in 1929 less than half the county trunk roads were surfaced, by 1939 fewer than 2,000 of the 13,800 miles of this group were dirt roads. During the same decade surfaced mileage on the old township roads quadrupled.

These gains were financed chiefly by local property taxes, but the state came to play an increasingly important role. Beginning in 1923, when a county's primary roads had been improved, part of its share of primary road funds could be used on its secondary roads. Additional state aid was received after 1925 from gas tax proceeds.

In 1939, in order to obtain the aid which Congress now furnished for secondary roads, the

farm-to-market road system was created, consisting of 10 per cent of the most heavily traveled secondary roads. A special fund was established to consist of all federal secondary road aid and, after 1940, all primary road fund receipts in excess of $16,000,000. In 1941 the ceiling was raised to $17,000,000. Postwar federal legislation increased the farm-to-market system to 35,000 miles, over a third of all secondary roads. These roads remained part of the secondary road system, but in order to obtain federal aid, the Highway Commission controlled the funds and supervised construction work.

After 1945 it became obvious that some changes would have to be made in the method of road financing. Ample funds were available to match federal secondary road aid, but in 1947 it was necessary to transfer $3,736,000 from other sources to avoid losing precious federal primary road subsidies. By 1948 primary road fund receipts from state sources alone were more than $29,000,000, but about 40 per cent had to be diverted to the farm-to-market roads. After July 1, 1948, the fund was so low that the Commission could not let any new contracts for primary road construction during the remainder of the year.

In an effort to find a solution to these problems the legislature in 1947 set up a road study committee of eight lawmakers and four private citizens, with Senator Jans T. Dykhouse of Rock

Rapids as chairman. The committee was ordered to submit a plan to the next General Assembly for obtaining a balanced program of primary and secondary road improvement.

Late in 1948 the committee recommended a twenty-year, pay-as-you-go program which, at existing prices, would cost almost a billion dollars. Of this amount, $482,000,000 would be required to pave the 2,200 miles of graveled or unsurfaced primary roads and to widen and rebuild the remaining mileage. The rest would be spent on secondary roads with the object to provide every reasonably located farmhouse with a surfaced road outlet, and reduce maintenance costs by resurfacing wherever necessary.

To raise the additional $14,211,000 required annually to finance this program, motor vehicle registration fees would be increased and taxes already collected from highway users but not used for highway work would be added to the road revenues. All road taxes collected by the state would be placed in a single fund to be divided on the basis of 48.5 per cent for primary roads, 6.5 per cent for municipal streets, and the remainder for secondary roads.

With the earnest support of Governor William S. Beardsley, who had been a legislative member of the study committee, and the newly formed Good Roads Association, this twenty-year program was adopted in 1949 with few changes. One

important revision allotted only 42 per cent of the proceeds of the new Road Use Tax Fund to the primary roads, instead of the amount asked for by the Dykhouse committee. Farm-to-market roads received 15 per cent and other secondary roads 35 per cent, 5 per cent more than suggested. Despite these changes, the new law increased primary road funds from the limit of $17,000,000 in 1949 to $27,400,000 in 1950.

The new program was well received. The Des Moines *Register* asserted: "We can now begin to recover from the long period of stagnation in highway improvement in this state." Claud Coykendall of the Good Roads Association, who had written the report of the Dykhouse committee, declared that the 1949 General Assembly "had to its credit more sound, constructive highway legislation than had ever been enacted by a single session of the Iowa legislature." As a result, Governor Beardsley said, Iowa was now "at the head of states in highway modernization."

Progress on secondary road work from 1948 to 1953 proceeded at a rate which, if continued, would provide all-weather surfaced roads to every rural home five years earlier than scheduled. Completion of the farm-to-market system seemed probable before 1960. Nearly three-quarters of the secondary road system were surfaced by 1954.

Primary road work, however, was far less satisfactory. By 1954, when work should have been

one-fourth completed, actually only about 12 per cent of the primary road program was finished. By 1954 about $130,000,000 had been spent for primary road construction, yet it was estimated that $767,000,000 would be needed to complete the work. The 1949 program had counted on a 33 per cent traffic increase by 1960, whereas in reality traffic in 1954 was already 38 per cent heavier than it had been five years earlier. The task of estimating future road needs, W. Earl Hall, Mason City editor, observed early in 1955, "calls for an imagination that just doesn't seem to be present in the human animal."

The average age of concrete pavement in 1954 was 23 years; less than 500 miles of paving in the primary road system were under five years old. A 22-foot pavement with four-foot shoulders for roads carrying less than 400 vehicles a day, on up to special four-lane highways for roads carrying over 4,000 vehicles per day, were the Highway Commission's standards for construction in 1954, but at that time about 3,300 miles of pavement were still the 18-foot model of the 1920's; only 150 miles were wider than 22 feet.

"Few if any of Iowa's licensed drivers living today will see an adequate primary highway system in the state during their lifetime," G. J. Timmerman of the Motor Club of Iowa declared, "if we continue to depend upon the present 'pay-as-you-go' plan." In 1953 his organization favored a

state road bond issue. "Good Roads — In Our Lifetime!" was its slogan. The right of counties to float road bonds was repealed in 1949, but a constitutional amendment in 1942 seemingly overcame the objections which the Supreme Court earlier had raised with respect to state bonds. A bill sponsored by Senator D. C. Nolan of Iowa City submitting a $300,000,000 bond issue to the voters passed the senate in 1953, but was not acted upon in the house. Clyde Herring, Democratic nominee for governor in 1954, called for a $175,000,000 state bond issue which would, he contended, permit the modernization of the primary roads within seven years.

The Good Roads Association, however, opposed bonds, using many of the same arguments which had been employed in the 1920's against the good roads forces when the latter were supporting bonds. In view of the similar opposition by most Republican leaders there appeared to be no chance of action favorable to road bonds in 1955.

The answer of the Good Roads Association to the road problem in 1954 was to increase the gas tax. In 1945 this tax had been raised from three to four cents on the gallon. As a temporary measure to last only until July, 1955, a fifth cent was added in 1953. After a lengthy debate between primary and secondary road supporters it was ordered that the proceeds from this increase be used to pave the graveled section of the primary road system.

The Good Roads Association in April, 1954, proposed to retain this one-cent increase, and, furthermore, to add two cents more. A fourth of this increase would go for secondary and urban roads, while the rest would be spent for primary road construction. In this way the Association hoped to increase annual primary road construction expenditures to $50,000,000, which "competent authorities" declared was needed if the system's modernization was to be completed by 1969.

This increase was opposed by the powerful Farm Bureau Federation. The Petroleum Industries Committee also disapproved, contending that if existing funds were used to modernize the most heavily traveled highways instead of the entire system, no tax increase would be necessary. But, as Chief Engineer John G. Butter candidly observed about a similar suggestion, "nobody would last long on a commission that did that."

Leo Hoegh, Republican nominee for governor in 1954, supported the retention of the fifth cent added in 1953, and, in addition, proposed to raise the gas tax to six cents, in order to accelerate the primary road program. He declared that Iowans should not think "that we can get roads without paying for them." With strong Republican support Hoegh's modified version of the Good Roads Association's proposal appeared most likely to be enacted in 1955.

Additional hope for relief of the state's road

problem came from two other sources in 1954. In August the Highway Commission reported that a toll road was "economically feasible" in Iowa in 1959 if bonds could be issued and sold at 3.5 per cent interest. The road's suggested route would roughly parallel Highway 6 from Council Bluffs to Davenport, where it would join a system of such turnpikes which eventually might stretch continuously into New England. The Commission and two cooperating engineering firms estimated that such a super-highway would cost $180,000,000. It would be financed through the sale of bonds by a toll road authority which would also build and operate the road. The bonds could be paid off within 21 years by tolls collected from the road's users.

The report, the result of a study authorized by the legislature in 1853, evoked few expressions of disapproval. Senator Charles S. Van Eaton of Sioux City and Representative Ernest Kosek of Cedar Rapids sponsored senate and house bills in the 1955 General Assembly which would create a toll road authority. Kosek declared that 75 per cent of the cost of the road would be paid by trucks and cross-state traffic. Primary roads would benefit by the routing of heavy interstate truck traffic over the toll road. Gas taxes collected from toll road users, Kosek pointed out, would help to develop Iowa's other highways. In addition, this toll road would qualify as an interstate

highway, and under the new national interstate highway program proposed in 1954 Iowa might receive federal aid equal to the amount spent on the toll road for use on other state highways.

Kosek's and Van Eaton's bills provided that as soon as the last toll road bonds were retired and thirty years had elapsed, the road authority would donate the road free and clear of all encumbrances to the State of Iowa. As long as no state funds were involved in this self-liquidating project, the general feeling was that Iowa had nothing to lose and everything to gain if a toll road was built.

Some were less enthusiastic, however, pointing out that such a road was no substitute for continued improvement of free roads, since the toll road would handle only 4 per cent of the total state highway traffic. Others declared that in states which had toll roads, the state highway commissions had been weakened and work on public highways had suffered as a consequence of the influence wielded by the toll road authorities. Since concessions along the turnpike would be leased to the highest bidder, who would have exclusive rights to serve motorists, several groups, notably the Motor Court Association, Restaurant Association, and Independent Oil Jobbers, who feared for their own interests, formed the Iowa Free Roads Association to oppose any toll road.

More directly beneficial was the prospect of greater federal aid which 1954 brought. From

1913 through 1954 Iowa received from this source over $140,000,000 with annual receipts increasing from the modest $10,000 of 1913 to the $12,400,000 allotted forty years later. Many Iowans pointed out, however, that this figure was less than one-half of the $30,000,000 drawn annually from Iowa by the two-cent federal gas tax and automobile excise taxes. Governor Beardsley, Representative Fred Schwengel of Davenport, and groups such as the Motor Club of Iowa were active in the national campaign to correct this situation. It was hoped either to force the federal government to allot a larger share of the taxes collected from highway users for road work, or to repeal the federal gas tax altogether, thus allowing the states to increase their own road taxes.

In 1954 Congress increased federal aid so that beginning in July, 1955, Iowa would receive $18,760,000 annually. In November this amount was dwarfed by a proposal of President Eisenhower's highway advisory committee headed by General Lucius Clay that $25,000,000,000 be spent in the next decade to provide a national network of modern highways. These funds would be used on the interstate highway system drawn up in 1947 which included some 700 miles of Iowa's primary roads. Initial appropriations for this system were authorized in 1952, but at the end of 1954 only a small amount had been spent in Iowa due to federal insistence on a 300-foot right-of-way and limited

highway access. The Highway Commission had difficulty in meeting such requirements.

The Clay committee's plan was certain to arouse considerable opposition from those who feared it would greatly weaken the states' control of their roads. In addition, matching the allotments, which in Iowa would amount to about $40,000,000 annually over and above regular federal aid, would be a formidable task, even though the states would probably have to provide no more than 40 cents for every 60 put up by the federal government. On the other hand, it would release more funds for use on other primary roads.

No matter what happens in 1955, however, the road problem will continue. Discussions regarding ten or twenty-year road programs are deceiving if they imply that the road problem will be at an end when these programs are completed. Pavements wear out and future road needs are unpredictable. The dilemma of the road maker was clearly stated by Fred R. White in 1920 at the start of the campaign to pave the primary roads. "By the time we get those roads paved," he forecast, "the first of them will be worn out and ready to start again. So let's go into it with our eyes open that we are starting something we will never finish." Much has changed since 1920, but time and experience have proved the wisdom of White's advice.

GEORGE S. MAY

IOWA'S PRIMARY ROAD SYSTEM, 1919-1954: A STATISTICAL RECORD[a]

		Road Conditions					Expenditures		
							Construction		
	Total Miles	Paved	Bituminous	Gravel	Dirt Graded	Dirt Ungraded	Primary Roads	Urban Ext.	Maintenance
1919[b]	6,432	25	.....	624	836	4,947	$ 741,314		
1920	6,619	67	.....	792	1,021	4,739	4,906,405		$ 614,297[c]
1921	6,616	236	.....	1,157	1,448	3,776	15,500,524		2,264,693
1922	6,615	334	.....	1,558	1,761	2,962	13,324,555		2,444,665
1923	6,647	419	.....	1,889	2,001	2,338	12,662,681		2,420,900
1924	6,660	502	.....	2,164	1,934	2,059	10,479,315		2,722,077
1925	6,674	569	.....	2,461	1,796	1,849	6,889,024		3,021,004
1926	6,654	650	.....	2,819	1,732	1,452	8,402,786		3,100,675
1927	6,665	940	.....	3,226	1,417	1,083	16,341,642		3,743,210
1928	6,761	1,625	.....	3,221	1,114	801	29,946,607		3,809,955
1929	6,770	2,317	.....	3,137	715	602	28,250,410		4,621,702
1930	7,242	3,272	.....	2,863	513	594	42,616,687		3,311,620
1931	7,789	3,804	.....	3,070	281	635	28,143,206		3,361,930
1932	7,845	4,086	137	3,067	117	438	14,337,094		3,021,681
1933	7,834	4,202	139	3,083	52	358	8,809,539		2,668,974
1934	7,909	4,313	324	2,933	175	165	11,313,112		3,145,910
1935	8,278	4,374	323	3,297	92	192	7,676,437		3,502,462
1936	8,318	4,546	469	3,130	63	109	11,150,294		4,337,011
1937	8,433	4,818	569	2,890	50	106	13,259,948		4,453,415
1938	8,498	5,090	587	2,690	52	78	11,120,896	$1,849,347[d]	4,268,107
1939[e]	8,541	5,135	614	2,661	51	80	3,312,839[f]	960,433	2,383,815
1940	8,559	5,208	671	2,592	22	62	6,424,236	1,633,402	3,868,850
1941	8,567	5,364	681	2,458	14	50	6,805,970	1,091,922	3,952,765
1942	8,558	5,459	727	2,335	19	18	6,700,460	602,947	4,114,870
1943[g]	8,601	5,489	762	2,330	2	18	2,419,737	1,201,875	4,063,256
1944[h]	8,641	5,497	752	2,359	14	19	416,133	705,803	4,047,500
1945[i]	8,644	5,499	753	2,357	14	21	551,039	18,770	4,881,870
1946[j]	8,651	5,495	742	2,381	15	18	1,638,875	129,984	5,002,678
1947	8,662	5,558	776	2,291	22	16	7,189,015	712,799	5,009,859
1948	8,654	5,615	788	2,222	16	13	10,003,140	1,700,441	5,990,052
1949	8,678	5,665	795	2,187	10	21	10,383,205	2,346,185	6,903,672
1950	8,680	5,716	846	2,081	16	21	14,508,601	2,611,042	7,413,089
1951	8,670	5,767	875	2,002	0	25	11,854,745	4,444,299	8,090,729
1952	8,674	5,832	948	1,869	0	24	21,688,870	5,397,404	8,812,508
1953	8,686	5,936	1,034	1,695	5	16	29,214,703	4,213,716	9,953,220
1954	8,673	5,990	1,006	1,649	12	15	17,802,812	4,758,271	8,852,284
Totals							$479,329,106	$34,378,640	$154,195,305

[a] Source: Iowa State Highway Commission's annual reports. Fractions of a mile or dollar have been reduced to the nearest whole number.

[b] Road conditions from 1919 to 1938 are as of November 30 or December 1 of the year listed, expenditures from December 1 of the year previous to November 30 of the year listed.

[c] Includes only last half of year. Primary road funds were not used for primary road maintenance until July 1, 1920. Maintenance of urban extensions of primary roads began in 1927. The expenditure for this work is included in the total.

[d] Prior to this date the Highway Commission did not list separately construction expenditures, if any, on primary road extensions in cities and towns. These extensions are separate from the regular primary road system.

[e] Road conditions from 1939 to 1942 are as of June 30.

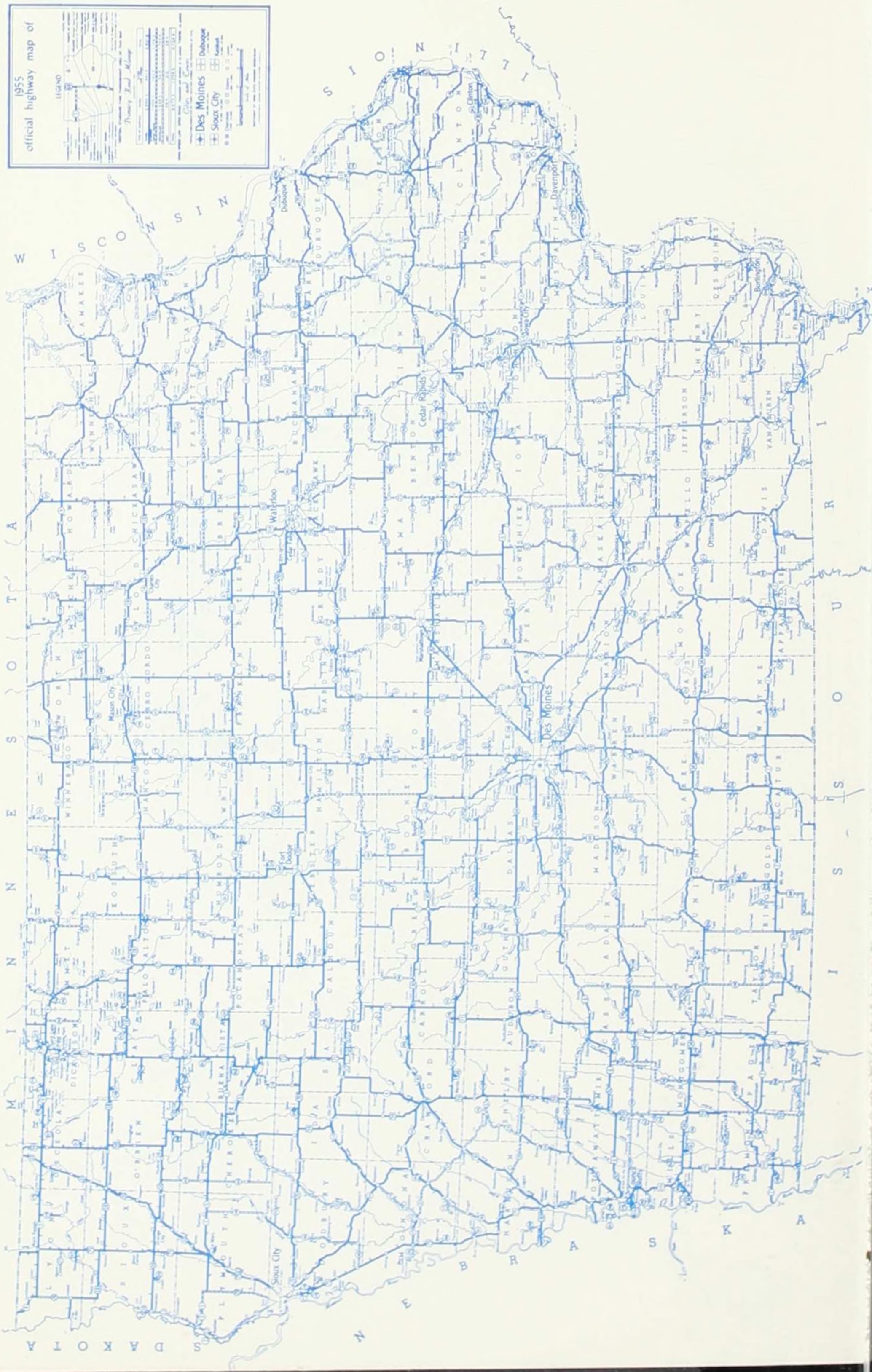
[f] Expenditures cover only period from December 1, 1938 to June 30, 1939. Beginning in 1940 expenditures are for fiscal year, July 1 to June 30.

[g] Road conditions are as of December 31, 1942.

[h] Road conditions are as of January 1, 1944.

[i] Road conditions are as of July 1, 1945.

[j] Road conditions from 1946 to 1954 are as of January 1 of the year listed.


1955
official highway map of
LEGEND
Primary Road Mileage
Cities and Towns
Des Moines
Dubuque
Sioux City
Keokuk
WISCONSIN
ILLINOIS
MISSOURI
NEBRASKA
SOUTH DAKOTA
MINNESOTA
Dubuque
Davenport
Clinton
Cedar Rapids
Waterloo
Mason City
Fort Dodge
Des Moines
Ottumwa
Burlington
Sioux City