

ARKANSAS HIGHWAYS

A black and white photograph of a dirt road winding through a wooded area. In the distance, a vintage car is driving away on the road. The background shows a hazy, mountainous landscape. The overall scene is serene and captures a moment of travel in a rural setting.

VOL.1

JUNE

NO.6

1924

Property of the
ARKANSAS HISTORY COMMISSION
STATE CAPITOL
Little Rock, Arkansas

SEBASTIAN county, one of the most progressive and thoroughly alive counties of the State, from the standpoint of good roads, furnishes us our front cover page this month.

The scene selected gives an interesting glimpse of the Fort Smith-Texarkana road, State highway "A-4," near Greenwood. This is a primary road, and one of the most important of the State system in Western Arkansas.

The particular unit here shown has been built by Sebastian county, co-operating with the State highway department, out of the revenues derived from the gasoline and license taxes levied under the new statewide law. It was a former Federal Aid section, abandoned when Federal aid was withdrawn from the State under the old system.

Traversing a beautiful country, with wide curves and easy grades, it is a highway of which the entire State may be proud.

It is surfaced with burned shale, a by-product of the coal mining industry of western Arkansas, with which the highway department is experimenting, thus far with great success.



ARKANSAS HIGHWAYS



Official Monthly Bulletin of the State Highway Commission
PAUL GRABIEL, Editor

"Arkansas Highways" is edited in the offices of the State Highway Department at Little Rock. Communications relative to advertising or articles and photographs submitted for publication should be sent to The Editor, care Highway Department, Little Rock. The bulletin is sent free of charge to State and County officials, newspapers of the State and Road Commissioners who apply for it. Permission to reprint any matter contained in "Arkansas Highways," with proper credit, is hereby granted to all newspapers of the State.

VOL. I.

JUNE, 1924.

NO. 6

Texarkana Shows Overwhelming Good Roads Sentiment

Recent Election Which Ties Arkansas System Up With That of Texas Analyzed by Chairman R. M. Hubbard.

EDITOR'S NOTE: At our request, Mr. Hubbard, who is chairman of the State Highway Commission of Texas, has written the following analysis of the recent Bowie county election in which virtually half a million dollars' worth of concrete roads were voted by the overwhelming majority of 2,098 to 83.

The election was of especial interest to Arkansas, not only because of the part played in it by Arkansas citizens living in Texarkana, but because of the fact that the new roads will bridge some important gaps between the Arkansas highway system and the fine roads of Texas.

A MATTER of more than passing interest to the good roads enthusiasts of Arkansas (in Texas, this includes most of the citizenship) was the road bond election so successfully carried May the 24th by the progressive citizens of the Texarkana road district in Bowie county, Texas.

It really was not an election, except in name only. It simply developed into a proposition of the public going to the polls and registering its confidence in the future of Texarkana and contiguous territory, and demonstrating to the world that the entire citizenship realized to the fullest extent the many great advantages of paved roads.

The result was easily foretold from the moment the Texarkana Chamber of Commerce, composed of both Texas and Arkansas residents, decided the time was propitious to take this forward step. As usual when this progressive body of men backs a proposition, the outcome was a foregone conclusion. The membership is accustomed to doing big things and doing them in an equally big manner.

And it was a big thing for Bowie county, when the decision was made to construct a system of concrete roads. And it was done in a big way, as the almost unprecedented vote of 2,098 to 83 proves. Considering the total number of votes cast, it set the record in Texas.

In addition to the practically unanimous vote cast for

the proposition, another notable, outstanding feature was the fact that of a total of \$490,000 voted, \$390,000 was to be used ONLY for the construction of concrete pavement, the remainder to be used in constructing important laterals.

The Texarkana road district is fortunate in having three state highways, all eligible for both state and federal aid. These are State Highway No. 1 (the Bankhead); which traverses the entire state from east to west, connecting Texarkana with El Paso; State Highway No. 5, which leads from Texarkana to the State of Colorado through the northern tier of counties, and State Highway No. 47, which enters Texarkana from the north, practically following the Arkansas and Texas state line into Texarkana; thence south into the adjoining county, and on into the State of Louisiana, affording Arkansas as well as Texas with a Shreveport connection.

The financing by the Texarkana road district of its part of State Highway No. 1, completes that state road for a distance of over 600 miles, and gives an admirable connection with Dallas, Fort Worth and the western part of the state. The financing of Highway No. 5, adds 12 miles more of high type of pavement to that state road, on which at the present time there is more surfacing of durable type, mostly concrete, than on any other road in the state. It completes the financing of all of State Highway No. 47. A bridge costing approximately \$150,000 is now under construction across Sulphur river between Bowie and Cass counties, from proceeds of a previous county-wide bond issue.



R. M. HUBBARD
Chairman, Texas State
Highway Commission,
New Boston, Texas.

Where Shall We Locate The Trunk Highways?

A General Discussion of Highway Location, by A. R. Losh, Federal District Engineer.

EDITOR'S NOTE: Mr. Losh's discussion of the location of trunk highways was begun in the May number, covering many factors which are considered by government engineers. At the close of last month's article, Mr. Losh was dealing with highway connections through the larger cities. The discussion is here continued.

WHERE it is necessary because of existing highways to carry the traffic of a highway through a city, it is desirable to do this on one continuous street and thus avoid the heavy traffic sections if possible. Also, it is desirable to avoid sharp turns and changes in directions within cities. It is often possible to effect these changes in direction outside the city and then cross the city practically on a tangent. This is the desirable course. City officials who are already confronted with traffic problems will co-operate to secure the best possible results. There are, however, still a number of officials who consider the highway as a part of "Main street out in the country" and believe, therefore, all traffic should follow the principal business thoroughfares of the city.

In these cases it will be difficult to secure immediate satisfactory adjustments. Many features of this part of location are beyond the control of the engineer and can only be worked out where public officials desire to provide for future development. Some engineers, in order to economize in construction costs, hit upon the expedient of combining two or more main highways for several miles outside the city. This is a questionable policy for the reason that it augments traffic congestion both within and without the city and prevents suburban development along several possible routes. It is believed to be a better policy to keep the highways separated and to develop short secondary connections between them as an additional means of dividing traffic for the several parts of the city and make this division outside the congested area.

Beyond the immediate effect of the terminals, we have the intermediate control features to consider in relation to location. These features are:

1. Natural conditions.
 - (a) Barriers such as rivers, valleys, mountains, etc.
 - (b) Soils.
 - (c) Drainage.
 - (d) Distance
 - (e) Grades.
 - (f) Alignment.
 - (g) Weather.
2. Development conditions.
 - (a) Population centers.
 - (b) Other transportation service.
 - (c) Industries and agriculture.
 - (d) Railroad Crossings.
 - (e) Existing Highways.
 - (f) Finance.

The limitations of this article permit only a brief discussion of these various features and their influences on location.

The natural physical features often act as barriers and in consequence highways develop along the same general direction of rivers, mountains and valleys with occasional

crossings. In making locations along natural barriers and also along artificial ones such as railroads, levees and canals, it is desirable to leave room between these barriers and the highway to permit development on both sides of the highway.

Numerous examples exist of highways laid out directly adjacent to railway lines with the result that suburban development proceeds rapidly along one side of the highway but is retarded where the railway prevents direct frontage on to the highway.

Nature of soils should be considered in location. Heavy clay, buckshot, gumbo, black waxy and similar soils all require special treatment to secure a stable subgrade. Cost of construction and maintenance may be influenced by soil conditions and an alternate route with better soil conditions might well be considered when better soil conditions are to be had.

Drainage features are to be considered in the same way as soil conditions. Sections subject to overflow should, in particular, be avoided due to effect on traffic and on the stability of the road itself.

Distance can often be substantially reduced by careful location study. This is especially true in sections of the country where public roads are laid out on the rectangular or section line system. In such cases a reduction in distance of from 15 to 25 per cent is frequently possible with similar topographic features to be met. Reduction in distance of from 3 to 10 per cent is frequently obtainable where the rectangular system does not prevail. The saving in cost of construction on the shortened line is usually much more than required to pay all right-of-way and damage costs for the new location. The value of distance saved has been estimated on the basis of capitalizing the savings on vehicular traffic at ten cents per mile. Where traffic amounts to as much as 100 vehicles per day the saving to traffic capitalized at 5 per cent amounts to \$73,000 per mile of distance saved. There is also to be considered the saving on construction and maintenance where they can be effected and the saving in time to road users which is difficult to estimate. When we consider the proportion of construction and maintenance costs of these highways paid by the vehicle owner, there is ample reason for considering the saving in vehicle operation as a factor in highway location.

Grades should be an important consideration in highway location. There is not available complete data on this subject which can be used as the basis for design. Some excellent information is to be had from the experiments by Professor Agg of the Iowa State College. From data available and from practical observation it appears that the maximum plus grades of considerable length and with good surfaces and alignment which can be traveled in high gear are between 6 and 7 per cent for automobiles and between 4 and 5 per cent for heavy trucks. Above these grades it is necessary to shift into second gear for long grades. The shift to low gear occurs at about 8 per cent grade for trucks and 10 per cent grade for automobiles. However, short sections of these heavier grades can be negotiated in high gear if the machine approaches the grade with some momentum. The maximum grades which can be safely descended without brakes and with the motor declutched is between

(Continued on Page Sixteen.)

Who Is Not Proud Of Arkansas?

By Herbert R. Wilson, Commissioner of State Lands, Highways and Improvements.



AS a native son of my State, and one to whom she has for the most part been more than kind, I have, always, since my earliest recollection, been proud of Arkansas.

I have gloried in her history, as I learned it at my parents' knees; in her brave and unselfish pioneers, who blazed the first paths through the virgin wilderness, leveled mountains, bridged raging torrents, hewed homes and plantations out of the inhospitable forest, pushed forward the frontiers of civilization and laid strong and deep the foundations of a great commonwealth.

I have gloried in these things. I have marveled at the strength, the fortitude and the vision of these early builders. They were truly wonderful, these pioneers of the "Wonder State."

I have been proud of the natural beauties of our State; of the mountains and plains, the forests and rivers, all filled with the richest and most varied of natural resources. I have been proud of all these things.

But, as I have cast my mind back over the past year, I have been proudest of the spirit with which this great people, harrassed almost beyond endurance by an unjust and overburdensome system of road financing; dismayed by the failure of an unwieldy, disjointed and ineffective system of road building, and humiliated over a well-organized minority drive for road bond repudiation, have rallied to the support of the constructive program given to them in the eleventh-hour by a legislature at last aroused to its real duty and responsibility.

There were many who thought it could not be done. There were many who feared Arkansas had sinned away her day of grace in road matters, and that for the delay, the unbelievable muddling and messing of it all, she must pay with an indefinite period of chaos and inaction, in which the remnants of her early and costly start at permanent road building must crumble and disintegrate into worse than nothing, while bond burdens grew heavier and more unbearable.

Matters did look gloomy a year ago. With Federal aid withdrawn, with the highway department closing for lack of funds, with road districts paralyzed, and the cry of repudiation of outstanding obligations resounding throughout the State, optimism seemed futile and out of place.

But there were those, mindful of Arkansas' wonderful past, and conversant with the underlying spirit of her present day citizenship, who believed that all would work out right. Among them, I was one. I confidently hoped for and trusted in the final awakening of the citizenship, and the successful working out of the tangle. I had no doubt of it. But that it would come in the course of a brief twelve months, and that it should be so complete and so satisfactory, even I had not dreamed.

And so I say of all things for which I have been proud of Arkansas, I have been proudest of the spirit with which Arkansas people have lifted themselves out of their road muddle and started the State upon a well-considered pro-

gram which will, as sure as it is adhered to, place her in the front rank of the commonwealths of the Union.

It has been a truly remarkable spirit and one of which every man, woman and child in the State ought to be more than proud. For only through pride in past achievement can we maintain the sentiment that will guarantee to us its continuation and its expansion in the future. And it is well for us to remember that true and proper pride can only be based upon knowledge and understanding, which makes it necessary that all of us contribute our share to the spreading among our fellows of the real facts of the road situation and of the ideal program that is laid out ahead.

What was our situation a year ago? For those who may already have forgotten it should be recalled that Federal aid had been withdrawn, for the reason that the Federal government does not spend its money on roads in states that have no State-wide system of road maintenance and road financing, and Arkansas at that time had none.

The highway department was closing because the governor, discouraged over the failure of the legislature to provide means for meeting Federal requirements, declared it was unnecessary and vetoed its appropriation bill, making it impossible to operate.

Road districts were paralyzed as a result of the withdrawal of Federal assistance and the inability of the State highway department to co-operate.

Public sentiment was muddled and misguided through the misrepresentation of the real situation by peanut politicians, some of them from other States, who thought to profit by the general chaos and the repudiation of Arkansas' road bonds, which was the real object of their drive. Even right-thinking men and men qualified as leaders of thought were themselves misled by charges of injustice, unfairness and graft which were hurled about indiscriminately, and hence much otherwise effective leadership was paralyzed or nullified. Arkansas was drifting into a dangerous situation.

Then came the special legislative session and the working out of the new highway law providing for a State system of highways and its maintenance in accordance with Federal standards; a shifting of part of the bonded indebtedness of the State from the shoulders of the landowner and farmer to the previously unburdened back of the tourist and the joyrider; a provision for the retirement of a part of the district bonds each year out of the gasoline tax, and for the aid of subsidiary county roads through diversion of some of the gasoline tax to the use of the quorum courts.

The new law, also, for the first time, gave to the highway department real authority over the building of roads, the maintenance of completed highways, and the supervision of contracts and engineering. It is well to remember that it was the lack of such authority in the years immediately previous that had kept the highway department powerless to prevent frauds and injustices for which, strangely enough, it was afterwards blamed by designing politicians and their ignorant dupes throughout the State.

How the new system is working out, and how that authority is being exercised, the people themselves, before whose houses the new roads are being built without added bond burdens, should be the best judges.

(Concluded on Page Five.)

A History of the National Military Roads in Arkansas

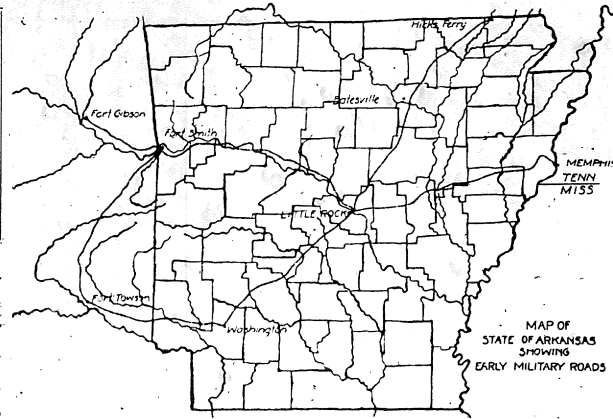
Written Especially for *Arkansas Highways* by Dallas T. Herndon.

EDITOR'S NOTE: We publish this month the second installment of Mr. Herndon's picture of the early road building which had so much to do with the development of Arkansas. In May, Mr. Herndon told of the thrilling experiences of two military couriers who made the trip from Little Rock to Memphis and return over the present route of the State highway, encountering many hardships in making their way through the forests and swamps. For the ordinary traveler or pioneer, he shows it was almost out of the question to attempt a land journey.

THE immigrant who succeeded in forcing a passage for himself by making straight into the region from the east was, for the most part, compelled to enter by the channel of the rivers. Nor had the situation altered in the least for the betterment until the road from Memphis, opening in 1827, made it possible for horsemen—even such, it seems, as were none too skillful, as woodsmen—hastily to cover sixty miles straight across the baffling swamp.

Onward from 1820, in the half dozen years between that and 1827, no want of evidence still exists of the actual isolation of the Arkansas settlements from the rest of the Union, which isolation was directly and chiefly attributable to the one great natural and, oftener than not, impenetrable barrier. Said the editor of the *National Intelligencer* in 1823, "Such is the vast extent of our country, and such are the natural obstacles which interrupt traveling, that we hear from England, France and Spain, indeed, from nearly every region of the globe, sooner, more regularly and certainly than we do from some parts even of our own country. Arkansas appears to be the region with which our intercourse proves most difficult, uncertain and the slowest. For instance, we have received, by yesterday's mail from the West, six *Arkansas Gazettes*, the first of date November 26, and the latest of the 28th of January—two months' news at a time." Meanwhile, of the many tales of hardships that were told by pioneer travelers themselves, "from personal knowledge," as said one who succeeded, thanks to a long dry season, in crossing into the interior on horseback, none leaves any room for doubt as to reason for the manifest isolation then of the greater part of Arkansas.

And none knew better than the pioneer himself what the promise of an easy and direct route of intake and outlet of traffic through the barrier of river swamps meant for himself and his country. Said one of a number of writers on the subject in the early part of 1820, "We have conversed with gentlemen intimately acquainted with the country through which a road from the Mississippi must pass and they are firmly of opinion that . . . the expense of cutting one out would be but trifling compared to the great advantage by it to be derived. By such a route we should receive intelligence from the eastern states perhaps four weeks sooner than can now be obtained from St. Louis." The issuance of a memorial to President Monroe by the first Arkansas legislature evinced unmistakably the state of the public mind regarding this question. "We request the aid of the United States army to assist in opening roads," said the memorial, obviously with especial reference to a road to begin at some point on the Mississippi river. It was further requested "that the soldiers furnished be placed directly under the command of Governor Miller."



Later legislatures were even more specific and importunate. Thence, indeed, for the next twenty years a session of the legislature rarely met but a memorial was addressed to Congress for funds with which "to open," "to complete" or "repair" the Memphis road.

In those same years road building enterprise had taken firm hold on the popular mind in nearly every quarter of the Union. The question had in fact become a national issue. The great Cumberland road had been now nearly twenty years building by piece-meal straight across the continent from Cumberland in Maryland. Albert Gallatin, Secretary of the Treasury in the time of Mr. Jefferson's presidency, had proposed an elaborate system of national highways for linking together in easy routes of travel the spreading, loose-knit parts of the Union. But Gallatin's ideas and statesmanship had been premature; the states, always jealous of encroachments on the powers reserved to themselves, were not yet ready to hear of the adoption of a plan for the yielding of powers making for so large a measure of centralization. The second war with England, though, had sharply emphasized the dire need of roads as a military necessity, as a means of national defense. With the war now out of the way in 1816, Congress and the country in general had been less opposed to a system of national highways when John C. Calhoun had urged upon Congress other plans tending measurably towards much the same ends as those which Gallatin had had it in mind to effect. And thereafter Congress seldom or ever met but certain local projects were vigorously pressed as projects proper to be financed by the government. Federal appropriations in aid of such enterprise undertaking within the organized territories were deemed particularly appropriate. Since the government derived large revenues from the sale of the public lands, the opinion generally prevailed that a part of the money so paid to the general revenue by those making settlements upon the public domain ought by Congress to be returned in expenditures for public improvements for the benefit of the settlers themselves.

Towards such a policy of national expenditures, as applied to opening and making improvements on the highways and waterways, the Arkansas pioneers never let slip an opportunity to importune Congress for a full, fat share

(Continued on Page Eleven.)

Faulkner's Beauty Spots Made Accessible By Highways

Conway Editor Is Enthusiastic Over Picturesque Places That May Be Reached by Motorists.

By J. B. Parker, in Conway News.

STARTING with a paraphrase, we might say that to him who, in the love of Nature, seeks her visible forms in this country, she will not hide her face.

At the end of the hard-surfaced road, going toward Damascus, at what is known as Fishtrap Bridge, one just begins to see the lavish display of scenery that always follows a water course through a country of abrupt hills.

Here the North Cadron Creek has labored for many thousand years to insure its free and untrammelled right to wend its way to the sea.

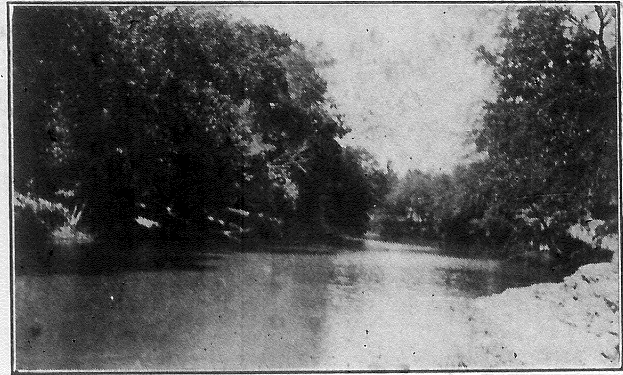
The product of its labors are expressed in cliff after cliff, cave after cave, beginning about a quarter of a mile above the bridge, sheer rises of stratified rock from fifty to a hundred feet, and almost continuous for a quarter of a mile stretches, then winding into a valley where clear blue water can rest and recuperate for another series of laborious effort.

About a half mile below the Fishtrap Bridge, half way to the new Mallettown Bridge, the Cove Creek empties into the North Cadron. Coming almost straight south from Martinville, this creek has little to do but run through fields of more than ordinary fertility, level and uneventful. But about two miles north of where it empties into the Cadron its easy days are over and it has been forced to do furious and Herculean labors to prove that nothing can forever stop the onward flow of water.

About one-fourth of a mile north of the Fishtrap Bridge, on the Damascus highway, the bluffs of the Cove Creek run almost to the roadside, and for a mile north of this point and a mile south, the seeker may find a never-ending and delightful series of pictures that will thrill his friend and make his camera prove its worth.

Here one finds what, in local nomenclature, is called the Devil's Chimney. This is a stack of rocks, stratified so as to look as if placed there by a master mason, about six or eight feet square, a little narrower in the middle than at either end, and rising at least fifty feet perpendicularly, and standing cleanly away from the other bluffs at least twenty feet. Its base is just in the edge of the creek.

If people knew of the delights of a tramp or picnic in this vicinity, or anywhere from this vicinity along the North Cadron to Hardin's Bridge near Holland, it would take the



Cove Lake, near Conway, a Rendezvous of Tourists.

edge from any desire to view the more-talked-about wonders of the big midwest sightseeing group. We should, at least, see the point: near home before we venture abroad.

WHO IS NOT PROUD OF ARKANSAS?

(Concluded from Page Three.)

They see, before their very eyes, the new roads going down or the old roads being reconstructed, re-graded, re-conditioned and maintained. In many instances the work is being done by them or by their neighbors, whose honesty, integrity and capability they are best qualified to judge.

They see these sections of road being tied up with the State system of 6,700 miles, through the bridging of heretofore impassable gaps, and being made into real, all-weather roads that go somewhere.

For the first time in their lives they see real road work being done in a systematic way that makes it an adequate return for the revenues expended. They see these revenues being expended in the community in which they are produced, thereby improving and stimulating local business. They see the State, on July 1 of each year, sending to the treasurer of their local road districts the pro rata share of the bond relief fund through which their road district taxes, will be reduced and finally wiped out.

They see all this, and rub their eyes, and wonder if the day of miracles has come, as indeed it has in old Arkansas. For a real miracle has truly been worked in the twelve-month since Federal aid was withdrawn and the highway department closed last summer.

And it is a miracle that will continue to repeat itself and increase its wonder as the years go by, so long as the present system is maintained. And all of it, in the last analysis, is due to that wonderful spirit of which I spoke at the beginning of this article, the spirit of a great people, of whom I have the honor of being the servant, and permitted to have a small part in the working out of the program.

Who is not proud of Arkansas? Surely only those who do not know her people and their problems, and understand their hearts with the understanding that comes from loving association and service.

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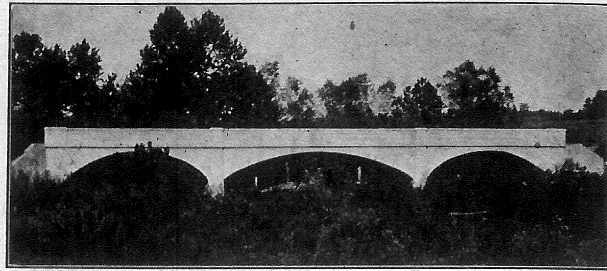
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PRESS COMMENTS

Work is still in progress on the highway * * * and has been lots of help to the country all around, as everybody who has more garden stuff, milk and butter or berries than they need sell it to the road camps, and it's cash, and lots of help for the farm women.—*Walnut Valley Correspondent of the Russellville Courier Democrat.*

Stone county should be grateful to our efficient highway commissioner, Herbert R. Wilson, for the prompt aid he has given us.—*Stone County Record.*



*Clear Creek Bridge in Washington County
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Fort Smith Is Proud of Her New State Highways

Ray Gill Points Out Delights for Auto Tourists.

No section of the State has taken more interest, or cooperated more heartily in the new good roads program than that which is tributary to Fort Smith, whose new road, reaching down toward Texarkana by way of Greenwood, is shown on our front page cover this month.

This road, built of burned shale, with concrete bridges and culverts, is a delight to the eye and a boon to traffic.

But Fort Smith boasts of other splendid routes, spreading in all directions of the compass, as Ray Gill, secretary of the Chamber of Commerce, points out in the following resume:

Fort Smith extends a cordial invitation to tourists. A delightful scenic route has been completed over the mountains just north of Fort Smith with a good route continuing to Little Rock and Memphis.

Automobile tourists from Kansas City via Joplin and from St. Louis via Springfield, Mo., can reach Fort Smith over excellent highways through the beautiful Ozarks by way of Bentonville, Rogers, Springdale, Fayetteville, Winslow, Mountainburg and Van Buren.

All bridges have been constructed and the route kept in good condition west from Fort Smith to Muskogee, Tulsa and on to Colorado Springs over the Albert Pike Highway. This route is well marked and the last bad gaps are being paved this year. The route is good now except two short sections immediately after very heavy rains.

The highway from Fort Smith to Spiro, Poteau, Heavener and Howe and west via Wister, Wilburton, McAlester to Oklahoma City is being rapidly connected up with well constructed gravel roads under constant maintenance. Con-

struction work near Red Oak, Oklahoma, obstructs this route at present.

The Arkansas scenic route south from Fort Smith is being paved through Greenwood to Mansfield and the State forces are improving the graded road to Waldron and south to connect with the Forest Reserve road just being finished through Foran Gap; north of Mena, Arkansas. From Mena south to Texarkana and Shreveport, the route is well improved.

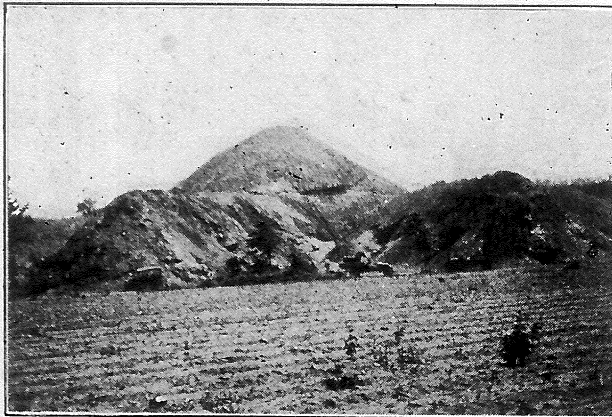
The east end of the Albert Pike Highway from Fort Smith through Waldron and Mount Ida to Hot Springs is being put in shape by the State Highway Department and will be a delightful drive before the close of this summer except in extremely rainy weather. Bridges will be built in another year.

The State road forces are also grading two routes south of the Arkansas river. One from Fort Smith via Greenwood to Booneville, Danville, Ola and Dardanelle, and the other through Charleston and Paris to Dardanelle.

A new road north will also be graded this year from Fort Smith through Van Buren, Natural Dam, Morrow and Cane Hill to intersect with the highway between Lincoln and Prairie Grove.

The Lions Club tourists' park at Fort Smith, with a supervisor and perpetual care by the city, offers tourists a delightful resting and camping place. The camp is close to the main business section of the city. Free natural gas, electric lights, city water, shower baths and comfort stations are supplied the visitors in the midst of a beautiful natural park of forest trees.

A SHALE PILE IN POPE COUNTY.



Burned shale, a by-product of the coal mining industry of western Arkansas, is a cheap and plentiful native surfacing material with which the State highway department is experimenting with good results.

It was used on the Fort Smith-Texarkana highway on the Greenwood section, shown on our front cover this month, and is proving highly satisfactory. The above photograph shows a pile near the Russellville mines which is now burning, and will soon be ready for use on sections of the Fort Smith-Little Rock road under State maintenance.

PRESS COMMENTS

Having had good weather for working on the improvement of the Ozan-Washington road, the road crews have been doing some rapid building. Car loads of the best gravel have been arriving here the past week, and put on the road.

This road improvement is being done by the state, we are informed, assisted by the county. O. Stuart, one of the best road builders in this section of the state, has charge of the work, and with a large crew of men and teams at work, the road building will be pushed rapidly.

Heretofore this road has been one of the worst in the country and this big improvement is something that will be appreciated.—*Ozan Farm-Labor Union Press.*

The road from Salem to Viola is the best 10-mile stretch of road in Fulton county. It was built under the provisions of the Harrelson act without a cent of real estate tax.—*Fulton County Democrat.*

The year 1924 is going to stand out prominently in Crawford county's good road history.—*Van Buren Press-Argus.*

The chances of good roads in this county are beginning to take concrete form.—*Camden Beacon.*

Leaves From the Editor's Notebook

"PAY DAY"

Some man from Georgia—what was that gentleman's name?—told us once upon a time that the district bond relief and county road aid features of the new State-wide highway law under which Arkansas now is operating were "all bunk."

He said they were "bait" to catch the unwary, and pull them out from under his own precious influence. He said the law would not produce enough revenue to make good on the promises of its proponents, and that if it did, it would be diverted to the uses of graft and extravagance. He said a lot of other things in a similar vein, all of which have been proved false by the actual experience of the people of this state under the operation of the law since last October.

The crowning answer to this erstwhile purveyor of free advice from Georgia will come in a couple of weeks—July 1—when there will be sent to the treasurers of each of the road districts of the State and of each of the counties checks on the State highway fund for the amounts due them out of the \$2,000,000 set aside for bond relief and county road aid. The money sent to the road districts will be used on this year's bond payments, reducing by that much the payments made by landowners in the districts. Those interested in the amounts and the percentages of tax reduction in their particular county may find the tabulation in their January number of *Arkansas Highways*. The money given to the counties for road work—less that part advanced some weeks ago by Commissioner Wilson—will be used by the county judges on county roads not a part of the State system.

"Pay Day" will be the final answer of the State of Arkansas to the wise boys who said it couldn't—and wouldn't—be done.

CONVICT LABOR ON THE ROADS.

Recent agitation against the leasing of convicts for the clearing of private lands has again brought to the front the question of using convict labor on the State highway system at periods when not needed on the State farms.

It is impossible at this time to say just what the outcome of the present discussion may be, but it may be of interest in this connection to recall that the State of Colorado has been using this system for the past 15 years, and that State authorities declare it to be highly satisfactory, both from the standpoint of the State's road program and of the welfare of the convict.

There seems to be less objection from free labor to such use of convict labor than to any other. It also seems to be popular with the convicts themselves, who like to feel, even though they may be under the ban of society, that they are doing something really constructive in the development of their State. It is also undoubtedly true that the work accomplished by convict gangs in such States as Colorado materially reduces the cost of good roads to the landowner and taxpayer.

All of these factors, we take it, are to be considered by those who may determine the State's attitude toward the question.



RADCLIFFE

STATEMENT.

Appropriations biennial period July 1, 1923 to June 30, 1924, and expenditures of the Department of State Lands, Highways and Improvements, July 1, 1923, to May 30, 1924.

REGULAR APPROPRIATIONS.

DESIGNATED APPROPRIATION	AMOUNT	EXPENDED	BALANCE
Land Division—Salaries as provided by law:			
1 Commissioner	\$ 2,500.00	\$ 2,083.30	\$ 416.70
1 Deputy Commissioner	2,400.00	2,000.00	400.00
3 Clerks	5,000.00	3,655.00	1,745.00
Clerks and Stenographer	1,500.00	1,200.00	300.00
Land Division—Maintenance	2,500.00	751.84	1,748.16
Automobile Division—Salaries as provided by law:			
1 Deputy Commissioner	2,400.00	2,000.00	400.00
2 Clerks	3,600.00	2,825.00	775.00
Extra Clerks for rush period	2,400.00	2,337.77	62.23
Automobile Division—Maintenance	50,000.00	48,472.27	1,527.73
Highway Department—Salaries as provided by law:			
1 Chairman	750.00	625.00	125.00
1 State Highway Engineer	5,000.00	4,166.60	833.40
2 Assistant Engineers	6,000.00	4,149.90	1,850.10
1 Secretary	2,700.00	2,250.00	450.00
1 Accountant	2,700.00	2,250.00	450.00
2 Stenographers	3,000.00	2,200.00	800.00
1 Chief Clerk	1,800.00	1,300.00	500.00
3 Draftsmen	5,400.00	4,715.00	685.00
Highway Department—Maintenance	40,000.00	38,081.78	1,918.22
State Highways—Maintenance, Construction and Re- construction	1,357,550.00	1,016,242.61	341,307.39
Aid—Construction of State Highways	1,000,000.00	1,000,000.00
Federal Aid Fund	3,000,000.00	3,000,000.00
Distribution to Counties and Road Improvement Districts	3,000,000.00	227,316.75	2,772,683.25
Salaries—Assistant Attorney General and Stenographer	2,700.00	1,800.00	900.00
Salary—Extra Clerk, State Treasurer's Office	1,350.00	1,350.00
Examination of Gasoline and Oil Records	5,000.00	1,479.39	3,520.61
TOTALS	\$8,506,650.00	\$1,371,902.21	\$7,134,747.79

Total Vouchers issued April 26 to May 28, 1924, \$523,706.24.

RECEIPTS AND DISBURSEMENTS HIGHWAY IMPROVEMENT FUND AT CLOSE OF BUSINESS MAY 28, 1924.

Balance in State Treasury, April 26, 1924		\$2,065,200.36
Receipts April 26 to May 28—		
Auto License Tax	\$ 101,684.47	
Gas and Oil Tax (Regular)	203,749.53	
Recovered under 1 Cent Law from Pierce Oil Co.	855.21	
From Chauffeurs, Transfers, Losses, Duplicate Registration Cards and Land Office Fees	363.00	
Refund on Warrants90	
Interest from depositories	6,735.12	
TOTAL Receipts for Month	\$ 313,388.23	313,388.23
		\$2,378,588.59
*Expenditures April 26 to May 28		536,795.73
Balance in State Treasury		\$1,841,792.86

*—This included \$227,316.75 which has been paid to the counties of the state as a partial payment of the amounts due in accordance with the provisions of the new highway law.

Auto License Fees for First Quarter Over \$2,000,000

Partial Report Shows Average Car Paid \$19.15 for Tags.

An incomplete report prepared by the accounting division of the State highway department for this issue of *Arkansas Highways* shows that the total of automobile license fees paid under the new law during the first quarter of the year will run over \$2,000,000, and that the average fee paid by the Arkansas autoist for his State tags will run slightly over \$19.

We are forced to go to press with this issue without reports from Pulaski, Mississippi, Calhoun and Conway counties, but it is known that these reports will bring the total above the \$2,000,000 and will modify the average license fee but slightly.

This sum, which goes into the State highway fund, along with the gasoline tax, is in itself more than enough to care for the July 1 payment of \$2,000,000 toward bond relief and county road aid as contemplated under the new highway law, and shows that the estimates of revenue made for the General Assembly last fall by R. C. Limerick, State highway engineer, when the new law was under consideration, erred but little, and that on the side of conservatism.

The detailed report by counties is as follows:

COUNTIES	No. Licenses Issued during First Quarter	License Fees Collected during First Quarter	Average Amt. of Each License	COUNTIES	No. Licenses Issued during First Quarter	License Fees Collected during First Quarter	Average Amt. of Each License
Arkansas	2,456	\$ 47,448.75	\$19.32	Lincoln	576	10,976.00	19.06
Ashley	1,123	19,925.50	17.74	Little River	697	12,878.00	18.47
Baxter	387	6,836.00	17.66	Logan	1,474	26,004.75	17.64
Benton	3,222	60,745.00	18.85	Lonoke	1,754	32,865.50	18.74
Boone	802	14,121.50	17.61	Madison	315	6,281.75	19.94
Bradley	897	17,057.00	19.02	Marion	220	3,806.50	17.30
Calhoun	Report not in			Miller	1,726	34,139.50	19.78
Carroll	923	19,496.50	21.12	Mississippi	Report not in		
Chicot	957	18,779.50	19.61	Monroe	692	12,896.50	18.63
Clark	1,173	21,304.00	18.16	Montgomery	458	10,502.50	22.93
Clay	1,453	25,728.00	17.70	Nevada	769	13,721.00	17.84
Cleburne	354	6,259.00	17.64	Newton	127	2,268.00	17.86
Cleveland	453	7,697.50	16.99	Ouachita	1,785	34,348.00	19.24
Columbia	1,377	25,494.25	18.51	Perry	168	2,971.00	17.68
Conway	Report not in			Phillips	2,263	47,869.00	21.15
Craighead	2,570	50,736.00	19.74	Pike	409	7,516.00	18.37
Crawford	1,384	25,248.50	18.24	Poinsett	1,011	18,702.50	18.50
Crittenden	1,189	25,737.55	21.64	Polk	673	12,799.00	19.02
Cross	750	14,097.50	18.79	Pope	1,605	29,330.50	18.27
Dallas	733	13,651.50	18.62	Prairie	1,000	17,652.50	17.65
Desha	947	19,284.00	20.30	Pulaski	Report not in		
Drew	879	16,856.00	19.17	Randolph	862	15,552.50	18.04
Faulkner	1,434	26,239.00	18.30	Saline	1,150	23,088.75	20.07
Franklin	1,131	20,198.25	17.85	Scott	314	5,492.50	17.49
Fulton	373	6,955.50	18.65	Searcy	249	4,621.50	18.56
Garland	3,115	67,827.75	21.77	Sebastian	5,845	114,852.50	19.65
Grant	673	12,134.00	18.03	Sevier	943	18,100.75	19.19
Greene	1,165	22,006.00	18.89	Sharp	442	8,272.50	18.72
Hempstead	1,189	23,347.00	19.63	St. Francis	1,177	21,917.50	18.62
Hot Spring	882	15,860.00	17.98	Stone	164	3,706.00	22.60
Howard	789	14,930.50	18.93	Union	4,239	79,170.00	18.68
Independence	1,020	19,099.00	18.72	Van Buren	268	4,772.50	17.81
Izard	295	5,133.00	17.40	Washington	2,997	59,209.50	19.76
Jackson	1,248	24,864.35	19.92	White	1,844	34,526.00	18.72
Jefferson	4,066	83,092.75	20.44	Woodruff	869	15,930.00	18.33
Johnson	836	14,834.50	17.75	Yell	1,068	19,298.00	18.06
Lafayette	861	15,841.50	18.39				
Lawrence	1,350	25,305.50	18.74				
Lee	691	13,366.00	19.34				
				TOTALS	85,300	\$1,633,577.15	\$19.15

A HISTORY OF NATIONAL MILITARY ROADS.

(Continued from Page Four.)

of the proceeds. Wherever after 1820 a group of pioneers were got together to talk over affairs of moment to the common weal, the plan of a road to open towards the east was never stale matter for discussion. Once the magic word was passed, tongues were instantly unloosed in a ready, nimble flow of other words, and all of one drift. From the lips of Arkansas politicians of that day was often heard this sentiment: "It is highly unfortunate for the interest of our infant country that at its very borders are presented baffling obstructions to the immigrant. The Mississippi swamp is highly calculated to fill the mind of the traveler with decisive disappointment and regret; has in many cases caused him even to retrace his steps with high anticipations of a comfortable residence blasted. Not until a dutiful government has perfected a firm road through that difficult region will our country fulfill the destiny intended it by nature."

The case of Robert Crittenden, acting governor in 1823, is a notable example of how the politicians harped upon this string, when he went out of his way to assert in a message to the general assembly: "It is with pain that I am constrained to turn your attention to a subject of far greater moment, over which a still deeper gloom lowers than at any former period The very fact of our severance from Missouri in 1819 was a pledge of support and protection on the part of Congress of the orphanage which it by that act created. Sad has been our disappointment We have respectfully asked only what should have been conferred upon us at the organization of the Territory. To all our petitions an inflexible silence is preserved. The liberality and munificence so conspicuous in the case of Florida, Michigan and Missouri has never been extended to our Territory; but, in lieu thereof, we have seen vast numbers of our citizens driven by order of the government out of their lawful habitations and possessions to make room for various tribes of Indians. Such proceedings are without a parallel in American annals."

Congress, due to the efforts and management of Henry W. Conway, made a fair beginning of the business of opening a road from Memphis in 1824. For by act of Congress that year to that end was set aside the sum of fifteen thousand dollars. The work was, as stated in the act, to proceed at the pleasure and upon authority of the President of the United States. For the selection of a suitable route, three commissioners, to be compensated in the sum of three dollars per day for their services, should be named by the President. Surveys were directed, however, by Congress to begin at a point opposite Memphis on the west bank of the river, and thence to proceed by the most direct and practical route to the town of Little Rock. So soon as the commissioners should make a selection of the most suitable route, the president might order soldiers of the regular army to the scene for the purpose of cutting out the trees and otherwise making a roadbed.

The survey of a route of one hundred and thirty-five and a half miles was ready before spring of 1826. Thereupon the work of cutting out the road was begun. Meantime, though, was abandoned the plan to set soldiers to the task of clearing the right-of-way. Instead Lieutenant Griffith of the army let the whole enterprise in four separate contracts. Contracts were awarded in April, 1826, one to A.

Carr, another to N. Anderson and a third to W. Irwin, all of Tennessee. Together these three awards called for a road of the length of sixty miles, to begin at a point near the river, four miles north from the place of actual beginning opposite Memphis. To a fourth bidder, a Mr. Hunt, was let the contract for opening four miles of road from the point opposite Memphis northward along the river, a detour taken in order to avoid a marsh which the surveyors thought it not practicable to traverse.

The contractors took the work at an average price to the government of one hundred and sixty dollars the mile. Contracts called for a road twenty-four feet in width. Ditches must be cut on both sides of the road; the earth thrown thence to the center, banked high enough to carry off all surface water. The plans called for bridges to be erected across all the smaller streams; the laying of causeways through the low marshes, and all bridges and causeways to be covered with a layer of earth to a depth of several inches. The larger streams were left untouched; for crossing the latter the traveler must look to his own ingenuity, unless perchance ferry boats should be instituted and kept by private enterprise.

Thus the first half of 1827 saw completed sixty-four miles of open road. Also was shown that to put the project through to Little Rock would need additional funds. Congress, therefore, made an appropriation of nine thousand and sixty-five dollars "in aid of the unexpended balance" to open the road westward from the house of William Strong on the river St. Francis:

(To Be Continued Next Month.)

Russell Badger Grader

A Light Standard ~ Combination Scarifier

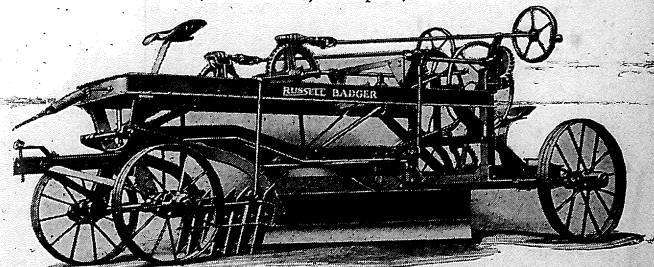
Scarifier and Grader in one unit. A medium size machine most suitable for work in city or township and requiring 4 to 6 horses or 8 to 12 h. p. Tractor.

The Badger may be equipped with scarifier ahead of blade and both worked in combination or may be worked with scarifier detached. A 6-foot blade is recommended when worked with scarifier and a 7-foot without scarifier. An 8-foot maintenance blade is also supplied if desired. Width of blade 15 inches, thickness 5-16 inches, carefully hardened and polished. Furnished with detachable cutting edge. The Badger combination weighs 2810 lbs.

The complete Russell Line includes - 8 Sizes Road Machines, 2 Sizes Elevating Graders, Maintenance Patrol Machines for both Motor and Horse Power, Scarifiers, Road Drags and Wheel Scrapers, Drag Lines, Gravel Screening, Crushing and Loading Equipment, Steel Beam Bridges, etc.

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RUSSELL GRADER MANUFACTURING CO.
OF TENNESSEE
489 Main St., Memphis, Tenn.



PRESS COMMENTS

J. P. Murray of Jasper spent yesterday in Russellville, and he declares that the road through the Ozark Forest Reserve is in the best condition it has ever been, and that the number of tourists is increasing as the summer season approaches. * * * Much work has been done in Newton county, and the long stretch of sand between Jasper and Harrison has been graveled and is a delight to autoists.—*Russellville Courier-Democrat.*

The Hot Springs-Glenwood-Amity road, which crosses a corner of this county * * * is now in excellent condition. The road commission and the State Highway department are also doing good work over the county, and it is possible we will have the best roads in the history of the county at an early date.—*Malvern Times-Journal.*

The first State highway work in this county was done on the road running north from Decatur. Critics who have seen it aver that if each strip of highway under the state's supervision is given as good treatment as this strip, the saving in tire bills to autoists will more than recompense them for added gas tax.—*Rogers Democrat.*

Highway Commissioner Herbert R. Wilson has done effective work under the road law. If improvements continue, Scott county will have good roads in every direction, and without cost to the taxpayers.—*Waldron Record*

ARKANSAS HIGHWAYS CAN NOW SECURE EFFICIENT AND ECONOMICAL CONSTRUCTION SERVICE THROUGH THE RECENT COMBINATION OF GREGORY & WILSON

who own and operate more road building machinery than any other firm in Arkansas, with the Southern Sand Company operating the largest sand producing plant in the State.

There is no longer any question regarding the value of good roads when economically and properly built to meet required conditions. Combining the material production with the construction end of the business tends toward economy.

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Road Forms	Batcher Plants
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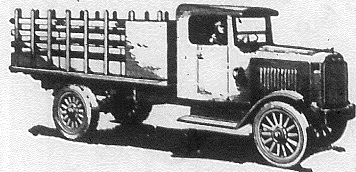
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The New Highway Law

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GOOD ROADS



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Little Rock, Ark.



CLOSE AT HOME

This 36-inch 14-gauge ARMCO Culvert was installed in Pulaski county, near Scott, Arkansas, in 1908. It was inspected and photographed in June, 1923, and found to be in perfect condition in spite of its slight protection from heavy traffic and the water which stands in it at least nine months out of each year.

After sixteen years of service this ARMCO (Pure Iron) Culvert has not only proven its rust-resisting qualities but it has proven its strength and ability to give years and years of service under adverse conditions.

There are thousands of other installations under varying conditions which prove that ARMCO Culverts are just as permanent as any roadway that can be built.

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**THE DIXIE CULVERT
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LITTLE ROCK, ARKANSAS

PRESS COMMENTS

Mr. W. J. Mitchell, who has charge of the roads in this part of Woodruff county under Herbert R. Wilson, highway commissioner, has finished repairing the road at Grays much to the delight of the heavy traffic that goes over that section daily. He has also repaired the road across Cache river bottoms at Jelks and has the road from McCrory to Fair Oaks in first class condition.

Under the direction of the highway department, Mr. Mitchell will go to Cross county next week where he will help Mr. Isom Maxwell, the man who has charge of the road from Fair Oaks to Wynne under the highway department, build a good road from Fair Oaks to Wynne. This is one of the most important sections of road in the state as it is the most practical route from Little Rock to Memphis. The gumbo sections between McCrory and Fair Oaks have recently been graveled and gravel will also be placed on such places between Fair Oaks and Wynne as soon as the road bed can be prepared for same.—*Arkansas Central Leader.*

H. Bearden made a flying trip to Little Rock last week. He left here at 4 o'clock in the morning and got back at noon the same day. Can anyone beat that for speed without flying?—*Solgochachia Correspondent of the Conway County Unit.*

The era of good roads is now on in Boone county and the country at large in fine shape.—*Harrison Times.*

PITTSBURG TESTING LABORATORY

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Bituminous Pavements

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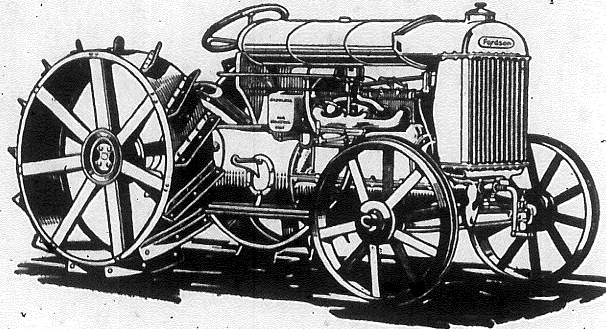
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The Burden of Good Roads
Is Being Borne by the Automobile.
By Reason of Its Popularity

BUICK
Is Bearing the Heavy End.
But Good Roads Are Worth
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PRESS COMMENTS

CROSS CROSSINGS CAREFULLY.

Beware of the first four letters of autopsy.—*Nashville Banner.*

WHERE SHALL WE LOCATE TRUNK HIGHWAYS?

(Continued from Page Two.)

3 and 4 per cent for long grades and much steeper for grades of only a few hundred feet in length. The safety of these grades is largely determined by alignment. The effect of avoidable rise and fall does not appear to materially affect gasoline consumption on light grades and reduction of grades below 3 per cent from the standpoint of economy is questionable. Except for isolated sections of short grades, it seems desirable to develop locations with grades not exceeding 5 per cent. Lighter grades are desirable but there is little economy effected in reducing grades below 3 per cent. In view of the variety of motor vehicles in use on the highways it is not desirable to jump from a 5 per cent to an 8 per cent gradient on the theory that if a high gear gradient is not available we should adopt a second gear gradient. A very important consideration in establishing a grade line is the matter of safety to traffic. This brings up the question of sight distance. The present practice is to design for 500 foot vision. This requires long vertical curves where a rolling profile is followed. In rough country it will be necessary to drop below this standard for sight distance. Generally vertical curves should be not less than 200 feet long for an algebraic grade difference of 2 per cent or less, and lengthened 50 feet for each additional 2 per cent algebraic difference. Another important consideration of grades is the matter of storm water run-off. With a grade steeper than 5 per cent there is a tendency for road shoulders, ditches and the lower types of surfacing to be eroded.

Exceptional progress has been made in recent years in the matter of alignment standards as used by engineers on highway work. Only a few years ago curves of 200 feet radius were considered sufficient, but now curves of less than 500 feet radius are exceptions to the standards and many engineers consider the six degree (955 feet radius) as the desirable minimum standard. These easier curves provide a better field of vision and thus reduce the hazard of collision. It makes reasonable speeds safe and thus effects a saving in time as well as adding to the ease of operation. In broken country grades and alignment are closely associated and it will not be possible to obtain such easy curves as 500 foot radius. Perhaps some sacrifice of grade should be made to alignment. Grades on sharp curves should be flattened or compensated. Reverse curves should have an intervening tangent. Curves should not extend up to bridges, underpasses or road intersections, but in all cases there should be a tangent intervening of at least 100 feet in length. A longer tangent is desirable between curves in the same direction. We have developed very little data on the effect of curves on traffic. Aside from the element of danger, it is evident from practical observation that curves of less than 500 foot radius are out of place on roads designed for heavy traffic moving at moderate speeds.

(To Be Concluded Next Month.)



High Standards Assure Concrete Road Satisfaction

Rigid, unyielding, skid-proof, Concrete highway pavement makes driving easy and safe.

It can be built to carry any kind of traffic indefinitely, practically without repairs. It has the maintenance built into it.

Wherever Concrete Roads have been properly designed and constructed, they are giving lasting satisfaction.

The present Highway Authorities of Arkansas are to be commended for the high standards they have adopted in building Concrete Roads for this state.

Our booklet R-3 tells many interesting things about Concrete Roads Write this office for your copy.

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STATE CAPITOL
Little Rock, Arkansas

Roads

Whither leads this highway, little one?—
It runs just on and on, is never done.

Whither leads this highway, mistress fair?—
That goes to town, sir; to the village square.

Whither leads this highway, father old?—
To the white quiet of the churchyard fold.

—JOHN VANCE CHENEY.





"Those 113,000 Cars"

says the King of the Black Tops

"They will either add much to the prosperity and comfort of Arkansas, or they will simply serve to keep the repair men busy; depending on what kind of roads you build for them to be driven over."

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The perfected product of a half century of experience in road building, aided by exacting research and scientific experiment. A sturdy body, combined with a smooth, shock-absorbing surface to create a unit that resists the hardest usage for years, and defies all kinds of weather. By actual test, the lowest of all good pavements in cost per mile per year.

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New York, N. Y.
Portland, Ore.
St. Louis, Mo.
Winnipeg, Man.
Harrisburg, Penn.

Birmingham, Ala.
Vancouver, B. C.
Chicago, Ill.
Phoenix, Ariz.
Washington, D. C.

Utica, N. Y.
Minneapolis, Minn.
Oakland, Cal.
Toronto, Ont.
Salt Lake City, Utah

Memphis, Tenn.
Los Angeles, Cal.
New Orleans, La.
Charlotte, N. C.
Dallas, Tex.