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ANCIENT PYRAMIDS WERE EASY BESIDE THIS JOB

Building a Hard Surfaced Road Combines Most of Arts and Sciences

By Ben Dixon McNeil in News and Observer

"You can't sit down and write a letter to Sears Roebuck saying 'Enclosed find $250,000 for which please ship to me at once ten miles of hard surfaced roads.' Roads are not in the catalogue, and you have got to build 'em."

Thus did Highway Commissioner Frank Page illumine the mind of a restive citizen who had come to Raleigh to find out just what sort of wires had to be pulled to get a piece of road finished, why somebody didn't get behind that fiddling contractor and make him do something.

"He's been piddling along there now since last September, and not done yet. Looks like he will not be through this whole summer. Why, look at me———." And so on. He just couldn't understand it, couldn't see any reason why they didn't go on and finish it and let people get some use out of it sometime.

A Lesson From Home

"Haw mony tons of fertilizer did you buy this year?" The question took the restive citizen somewhat aback. He was thinking about the slowness of contractors.

"I got forty tons this year. Why?"

"How far did you have to haul it and how long did it take you?"

"Four miles, and off and on, the boys were about a week at it, maybe more than that. The weather was bad some of the time and—"

"Do you know how many tons of rock and sand and cement that piddling contractor has got to haul, some of it ten miles, before he finishes that job you are kicking about?"

He didn't know. He hadn't thought about it, thought he had seen trucks going back and forth. "Well, I'll tell you. That contractor has got to move 4,836 tons of stuff, some of it ten miles and all of it an average of five miles, and he has got to haul it in good weather," stated the Commissioner.

Why Not Hurry?

"Well, why don't he get him some more trucks and get through with it?" The inquisitor was in no wise ready to surrender.

"Why didn't you get all the wagons in the neighborhood and get through with your fertilizer in one day?" the Commissioner countered.

"Wouldn't pay."

Wouldn't pay you, would it? Well, how long did it take you to get your fertilizer under the ground?"

"Part of it under the shed yet. You know how to put out fertilizer. It took about two weeks, one distributor, one plow and then a cotton planter."

"Why didn't you get half a dozen distributors and half a dozen plows and do it all in one day?"

"Say, don't you know any more about farming than that? Don't you know that's foolishness?" The restive citizen, who happened to be a farmer and a member of the board of county commissioners back at home was beginning to think that the Commissioner was gone plumb beyond all reason, or that he was not good enough Tar Heel to know even the rudiments of farming.

"Don't you see it, don't you see that there has got to be common sense in building roads just like there is in farming. You can't get your fertilizer home in a day, plant your crop the next, harvest it the day after and spend the rest of the year doing nothing. It just doesn't work out that way. It's the same way about building a road." The Commissioner had convinced one citizen that it takes time to build a road.

All of which about sums up why North Carolina can't get its roads built overnight. Building a mile of hard surfaced road involves more labor and more material than the construction of a ten-story building, but stretched out along 5,280 feet of ground it doesn't show up, and most of the work done out of sight of the public.

Some Science in it

Building a road involves a more highly developed technique than building an office building. Things have got to be just so, even to the number of seconds that the rock and sand and cement are mixed together in the mixing machinery, the number of gallons of water that go into the mixture, the accuracy of the measurements of material, the texture and qualities of the material, the set and the curing of the mass after it is belched out of the mixer.

The weather has got to be right. It can't be done in the rain, nor right after a rain, and when it doesn't rain, the creeks run dry, and drouth is likely to stop work for weeks at a time. Hard surfaced roads come only through patience and constant attention to the minutest detail in the measuring and mixing of the aggregates, and the 14-day vigil that comes while the cement is getting its "set."

16 Miles Per Week

Three hundred feet of pavement per day, and an average of four days work a week in the spring, summer and fall is an average that contractors and highway engineers and inspectors dream about at night. Just now there are 70 construction gangs in the State maintaining that average, and 84,000 feet of pavement are added to the State system every week. But think back to the rains and snows and freezes of last winter, and the rains that are ahead.

Figured back to the basis of the individual job, it is less than a quarter of a mile a week, and a mile per month is a profitable average in good weather. That is where the citizen who wants his road when he wants them gets restless, and not infrequently gets so restless that he gets his hat and comes down to Raleigh to see what's the matter. If he can't come, he buys a stamp.

"Why can't he get along faster? Have we got to stand for that detour for the rest of our lives?" Constantly the question recurs, the folks cuss about getting stuck on a detour somewhere and write sarcasitc letters about the whole business. Chief Engineer Upham calls it a "detour year," a year when so much of the touring in North Carolina will be detouring.

It's a Sizeable Job

But why can't it be done faster? How many of these restless citizens know what the State of North Carolina asks for when it offers a road to a contractor, or how he will go about selling the road to the State? How many ever saw the specifications of a piece of hard surfaced construction. Take for instance that project to be let down in Cumberland county week after next. This is what is wanted:

Clearing and grubbing, 17 acres; excavation, 59,200 cubic yards; ditched, 2,000 cubic yards; 1,181 lineal feet of cast iron pipe, 16 to 30 inches in diameter; pavement, 116,940 square yards, 6-8 inch thickness. The job is 11.07 miles long, stretching toward Raeford, and in most particulars is an average of the conditions throughout the State.

The contractor will figure the thing out on the unit basis and submit his bid. Should he happen to be low, he will assemble about $75,000 worth of machinery and equipment, buy 385 carloads of crushed stone, 358 carloads of sand and 167 carloads of cement. He will go to work, and in a year or so, he ought to be through the job.

How Job is Started

Back of the bidding in of the contract is yet another story, of how the State found out exactly how much work there was to be done, and set the specifications down on a piece of paper. First, of course, Commissioner McGirt designated that road as one he wants built as soon as possible, and it was designated for "immediate construction." Instructions went out to the engineering department.

Preliminary surveys were made to locate the road, to mark whether it should go this side or the other side of such and such a field or just where it should cross this hill. After the first survey came other engineers, and designed the road, accounted for every shovel full of dirt that would have to be moved, computed the last truck-load of rock that would be needed. Then the plans came to Craven's department and every foot of the road, grades, curves and the like were made ready for the blue print.

Find Local Materials

Before the specifications are sent to the contractors, the Department of Inspections and Tests takes a hand. One of its men goes down to the prospective job and over every acre of the groud looking for native material that will come up to the specifications. If there is any stone, he finds out if it will do for road building. He looks for sand, for gravel, calculated the quality, and measures the haul, and takes note of the accessibility.

Reports of these investigations are attached to the call for bids. The contractor can figure just how much local material he can use, and how much he can save. One contractor recently made out his bid before he got the material survey, and when he did get it, he cut $65,000 off his bid and got the job. Otherwise he might have be.i buying stone from West Virginia when there are acres of it within a stone's throw of his job. This department costs something like $2,000 per month, and saves, well, nobody knows how much.

Ordinarily the contractor does not buy his cement and in some cases the purchase of the sand and stone is left to the Commission. A fixed price is made on materials, and the bid is figured on that basis. The Commission buys through competitive bidding, in large quantity, and generally is able to effect a big saving. If he does his own buying, he gets stuff as low as he can, and usually at a price obtained before the bid is submitted.

Included in the contractor's outfit is a concrete mixer, eight to twelve 3-ton motor trucks, with dump-bodies and a very short wheel base, a loading crane, steel forms, and a raft of smaller miscellany. For the grading, twenty to forty teams, and if the work is heavy enough, a steam shovel. For the 1,190 carloads of material that he will use, the railroad will provide side tracks. He builds loading and measuring bins, and a warehouse for cement.

Get Ready First

First the grading. Any schooy boy who hasn't forgotten the formula for extracting the cube root from 60,000 cubic yards will be able to figure just how big a pile of dirt that is. It is a tremendous pile of dirt, but it comes in handy filling up low places on the right of way, making embankments and fills and the like. Five per cent is the maximum grade allowed on a State road, a rule that has been abrogated not more than twice in all North Carolina, and then for special reasons.

Water pipes have to be laid, and the machinery set up. These things are done usually while the grading is getting under way, and the sub-grade allowed to settle. If sub-grade is too technical a term, it is the ground, just plain, everyday ground, where the concrete is going to be laid down. It has to be drained and smoothed out and solidified, and settled and made ready for the tremendous weight that it is to carry for the next few decades. It is as important as the foundation of a sky-scraper.

At Last the Pour

Then they begin to pour, as the saying is. That is they begin to put down concrete. A truck comes lumbering down the right of way, loaded with three tons of rock, cement and sand. The aggregate is "one-two-and-a-half-five," or one part cement, two and a half parts sand and five parts crushed stone. It mounts a turntable, is turned around, backs up to the mixer and dumps the aggregate into the hopper of the mixer.

Ninety seconds, after the mass is whirled around and around in the mixer a sluice opens, and the gray, stjcky mass comes out into a traveling bucket. The bucket shoots out along a sweep, the bottom drops out and the mass is spilled out over the subgrade, which has been smoothed out like a floor. There laborers with spades smooth it out, and tuck it up against the steel sides of the forms. The first concrete is laid, two and one-third cubic yards of it.

More trucks and more whirling of the mixer, more falling out of the bottom of the bucket. Three hundred feet in one day is a tremendous trip for the mixer to move along the right of way, and there are smiles of satisfaction. If the schedule of the trucks is not carefully worked out, the mixer must wait, or trucks must stand in line waiting their turn to disgorge the dry elements that will presently become concrete. Or if the water doesn't flow in a steady stream. It is a highly synchronized business.

But that is not the end of the road. It is not finished. The next fourteen days are as critical as the proverbial baby's second. Then is the time that the summer meticulous care must be taken. Otherwise the concrete will crack. It must get its set, and then it must be cured, and somebody has got to sit up at night with it.

First comes a man with what they call templates, a sort of a glorified and magnified trowel that smoothes the smallest wrinkles out of the wet soggy surface, and leaves it is clean as a pane of glass. Then very tenderly they lay heavy burlap or canvas over the new-laid pavement, and turn on the hose. For 24 hours a steady stream of water is kept running over it. The burlap is kept soaked.

After that they take off the burlap and spread two inches of earth over the surface. More water, constantly, keeping the earth always wet for 14 days. Twenty one days and the earth is removed and at the end of the 28th day, traffic can begin to travel over it. By that time it has its set, and has been thoroughly cured, to use a phrase that these road technicians have borrowed from the tobacco grower. The road is finished.

"Contractors are just as honest and conscientious as any other class of men in the world, but some of them have to be watched," Mr. Page says now and then. He watches them all all the time.

Never a second while the work is in progress is it away from the eyes of an inspector. Long investigation, and costly experience have taught road engineers how to compound the mixture that goes into a road, and the specifications say what it is. Sand is cheaper than cement, and stone is cheaper than sand, and there are contractors who would not hesitate to put in less cement if they could get away with it.

The specifications say that the road must be six inches thick on the sides and eight inches thick in the middle. Half an inch cut off the depth anywhere would mean eight per cent less cost in the road, and that much more profit to the contractor if he could get away with it. Some of them try it, and some of them lack training, and many of them don't need watching. But they all get it.

Up at the loading bins, there is an inspector who watches every bag of cement that goes into the box, measures the stone for it and the sand. Down at the mixer is another man who watches the indicator to see that the mix is ninety seconds. Thirty seconds off would speed up the job, but it would show up later when the cement began to crack.

Another check is maintained back in Raleigh in the testing labratory. The contractor submits to the Commission an account of every bag of cement that he uses and an account of every foot of pavement he lays. They can figure out to a yard how much pavement he ought to have laid with so much cement. They do figure it out, and some recent figuring will probably develop some things.

One inch of the right sort of cement has two and a half billion particles in it. On that depends its value. Other cement is not good for roads, but the contractor can get it for less money. Some contractors would use it, but the testing department tests every shipment of cement that comes to a job in North Carolina. Very often the manufacturer wails and gnashes his teeth and sell a rejected car load of cement to somebody who is less careful.

But why can't all this be done faster?

Hard surface roads are 18 feet wide, and there is room for but one concrete mixer and three men working abreast. Two mixers on different locations would double the size of the organization, the overhead cost of operation, and the cost of equipment. Concrete work has its limitations, and anyhow, the roads are going to last several life times if time is taken with building them.

The restive citizen got his hat and went home. He didn't know until he got to figuring on the back of an envelop that this year North Carolina will buy 19,512,000 tons of road building materials, dump them into a hundred hoppers and see them come out on the other side in the shape of 450 miles of hard surfaced roads, or that the State was so almighty particular about it.

SHOCK OF METEOR FELT OVER WIDE AREA

Meteor, Composed of a Metallic Substance, Buries Several Trees With it and Causes Spout of Flames Visible for Many Miles.

Norfolk, Va., May 12.—The shock of a twenty-ton meteor which crashed to the ground in an isolated spot in Nottoway County, 12 miles northwest of Blackstone, late last night, was felt for a radius of fifty miles, while the brilliant glare of the candescent body illuminated the heavens over southern Virginia and sections of North Carolina. The trail of light as the meteor fell in a slow curve from the zenith at an angle at about 45 degrees, was visible in this city, Richmond and at points along the James river, creating general excitement and even consternation on the part of negroes.

The meteor, composed of a metallic substance, crashed into a grove of oak trees with an explosive roar some distance from any house, making a hole with an area of 500 square feet and burying several trees with it. Flames which immediately shot up were visible for many miles, while trees caught fire.

A party of scientists and newspaper men immediately left Richmond and this city for the scene, which is 120 miles west of Norfolk, but the results of their investigation were not known tonight, as telephone communication was unavailable.

The shock of the fall was felt at Lawrenceville, Petersburg, Chase City, and other points. At Lawrenceville, 100 miles west of here, windows rattled and houses were shaken while at Chase City similar effects were noted. Automobilists on the roadways in Mecklenburg county said it seemed as though their cars had caught fire, so great was the illumination.

In Norfolk the meteor appeared to be about half the diameter of the full moon and much like a street arc-light. Its tail, of orange brilliance with a sharp blue flame fading out at the extreme end, apparently was about ten or twelve times as long and fully as broad as the body.

In Richmond a streak of light was noticed before the ball of fire was seen whirling through space to be followed by the reverberations of an explosion. The entire southeastern skies were illuminated as if by a flash of lightning and a burst of flames.

Meteor Causes Shock as if by an Earthquake

Richmond, Va., May 12.—Almost the entire south side of Virginia was shocked as if by an earthquake when a meteor resembling a large ball of fire fell last night about 11:15 o'clock. A great streak of light is reported to have been noticed in the sky before the ball of fire began swirling through space and before a noise that sounded like a great explosion was heard.

A report from Chase City, ninety miles from Richmond, is to the effect that the meteor was not only seen there, but that the explosion caused buildings to shake, dishes to rattle and furniture to rock in many houses. Automobilists who were on roadways in Mecklenburg county are quoted as saying that it seemed as if their cars had caught fire, so great was the illumination.

One Chase City man said this morning that the meteor fell northwest of that town. He said inhabitants of Chase City and Mecklenburg county were badly frightened and rushed from their homes, fearing that an earthquake was causing the houses to shake. He reported no damage to property, however, and said no one seemed to know the exact point at which the meteor struck the earth, if it landed at all. The phenomenon was witnessed by many Richmonders who were on the streets shortly after 11 o'clock. The entire southeastern skies were brightened as if by a flash of lightning or a great burst of flame. While the shock was not felt here as at points south of the James river, it attracted a great deal of attention, a noise similar to that described by persons at Lawrenceville and other points being heard in Richmond when the detonation occurred.

A lot of stores are selling paper flowers and some of them so realistic that they fool everybody except the bees.

QUESTIONS ANSWERED

Facts About the Kentucky Tobacco Growers Association

Raleigh, May 15.—President Stone of the Kentucky Burley Tobacco Growers Association has answered the questjonnaire sent out by the Greenville, N. C. Tobacco Board of Trade in its efforts to discredit cooperative marketing in North Carolina. Saying that these questions are easy to answer President Stone has sent the following to headquarters of the Tobacco Growers Cooperative Association, at Raleigh, N. C.

1. What per cent of the Kentucky crop delivered to the Association has been sold by the association?

Answer: Fifty per cent.

2. What per cent of the tobacco sold was the best tobacco delivered to the Association?

Answer: Leaving out the green grades, the tobacco sold was not above the average of what we still have on hand. This question will be answered more fully below.

3. What per cent of the tobacco now in the hands of the Association is common tobacco?

Answer: There is approximately twenty per cent of the tobacco we have on hand unsold which is common tobacco.

4. What per cent of the 1921 crop of Burley tobacco that has been delivered to the Association, is still in the hands of the Association unsold?

Answer: Same as number one.

5. When will the Association sell this tobacco, that is still in the hands of the Association?

Answer: We sold five million pounds of our re-dried tobacco last week, and judging from the demand we have for it, it will be sold in the next sixty days.

6. When will the Association pay the farmer in full for his 1921 crop of Burley tobacco?

Answer: Soon as all the tobacco is sold in orderly and profitable way.

7. When will the association be able to tell the Kentucky farmer what his 1921 crop of tobacco averaged?

Answer: As soon as all the tobacco is sold.

8. What per cent of the value fixed on the Kentucky tobacco, did the Association advance the farmer?

Answer: Approximately thirty-five per cent in cash on the delivery of his crop to our receiving plants.

9. Does the Association require you to deliver all of your tobacco crop at one time, or can you deliver it one load at a time?

Answer: The grower can deliver it all at one time, or one load at a time to suit his convenjence.

10. Is the Association liable to you in case the tobacco you deliver to them damages, before it is sold or redried?

Answer: No when the grower delivers his tobacco to the Association, he is issued a receipt showjng the number of pounds of each grade he has delivered and the identity of each man's tobacco is lost from that time on and each grower owns his pro rata part in the total number of pounds received by the Association of the grades delivered by the grower, if any tobacco is damaged in any grade all the growers in the Associjation, who owns any part of that grade stands that damage pro rata.

11. When will the Kentucky farmer know what it has cost him to sell his tobacco through the Association?

Answer: As soon as all the 1921 crop has been sold and the final distribution made. However, we have thoroughly demonstrated to the satisfaction of our members that the expenses of our first year's operation will not be as much as the grower in the past paid jn actual warehouse fees to sell his crop over the loose leaf floors. Up to the first of April 1922 by which time all of our receiving plants had been closed, and the largest part of our expense of operation had been paid, it cost 40 cents and 1 mill per 100 pounds for actual, operation expenses. And this operation expense includes all receiving plants management, including common labor, salaries of graders and general office expense including salaries, but does not include the cost to the farmer in payment for the real properties which are being used for receiving plants. This will be about 1 cent per pound per year.

12. What per cent does the Association agree to advance North Carolina farmer on his tobacco when delivered?

Answer: This no doubt will be decided by the Tobacco Growers Cooperative Association of Virginia, North and South Carolina in connection with tobacco representatives of the Banks furnishing money for advance.

13. What per cent did the contracts signed by the Kentucky farmer agree to advance?

Answer: There was no agreement in the contracts of the Burley Tobacco Growers Cooperative Association agreeing to furnish any particular amount but the amount to be advanced was decided by the officers of the Association who represented the members of the Association and expert tobacco men representing the banks who agree to furnish the money.

14. Who places the value on the tobacco delivered to the Association?

Answer: Answer in question thirteen.

15. Does the farmer see his tobacco sold?

Answer: No, unless he wants to. The Burley Association is not doing anything under cover and any member has a right to any information in regard to what the Association is doing.

1. Can the farmer refuse to accept the price the Association sells his tobacco at?

Answer: No, the members select the Directors in their respective districts in whom they have confidence, and those Directors direct the policy of the Association. You might add to the answer of this question, what could the farmer do under the old auction system, if he did not accept the price he got on public sale?

MEREDITH COLLEGE TO MOVE FROM RALEIGH

Trustees Vote to Build New Plant for 500 Girls at Method on Big Farm

Raleigh, May 13.—Meredith trustees today voted to move the Baptist college from Raleigh to Method, where the trustees have an option on 135 acres of land known as the Tucker farm.

The trustees made this momentous order without opposition on Raleigh's part. The institution has outgrown its city quarters on Blount and Edenton streets. When the girls come down from their rooms they are on the side walks, objectionable from their standpoint, beautiful for the city dwellers.

By going to Method they will have acres of recreation space, grounds for golf and every modern amusement.

The first work will be the construction of a $1,000,000 plant. The institution will hardly open without room for 500 girls and buildngs adapted to easy enlargement. The transfer cannot possibly take place within two years and it may take four. The money must be raised before the transfer is completed. The $75,000,000 campaign will release $250,000 for the college. The grounds in the heart of the city will be salable doubtless for another $250,000.

Today's action was the result of a resolution a year ago. President Charles E. Brewer was a strong advocate of more room. Meredith cares for its 300 girls in the dormitories with great difficulty. The institution has reached its capacity and it now merely marks time. This necessity overcame the sentimental argument which was decidedly against moving to a place bounded on the north by the state penitentiary and the south by the Method population.

Look to Lightning Bug to Alter Radio Methods

Peoria, Ill., May 11.—If science can discover how the lightning bug's sending apparatus flashes light waves present day radio science may be superseded, E. G. Shalkhauser, professor of physics and radio science at Bradley Polytechnical institute here, said today.

Professor Shalkhauser believes that the fire fly can send out an electric magnetic wave, but its source is still a mystery and this he is investigating.

"If we could find this source, I think we could throw away all our antennae, audion bulbs and other apparatus, because in my belief the lightning bug may have a little power plant of his own more highly perfect than any fruit of radio science," said Professor Shalkhauser. "It has been proved repeatedly that the wave transmitted by the bug is a cold light wave. The light wave, heat wave and radio wave are the same in a sense because they have the same frequency. It may be possible to tune down to a sufficiently low wave length to discern the bug code.

Demonstration in Honor of Wilson

Hot Springs, Ark., May 10.—A demonstration in honor of former President Wilson; adoption of resolutions of greetings to Mr. Wilson, President Harding and Secretary of State Hughes; the reading of reports on the collection and disbursement of centenary funds; the transaction of a quantity of routine business occupied the attention here yesterday of delegates to the nineteenth quadrennial conference of the Methodist Episcopal church, south.

The outburst came with the introduction of a special resolution which lauded the former president for his efforts toward the establishment of international accord and congratulated President Harding and Secretary Hughes on the work done by the Washington conference. When the reading clerk spoke Mr. Wilson's name his succeeding words were drowned in the flood of cheers and applause.