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SAND-CLAY ROADWAY

Methods of an Expert In Con-
structing It.

NEEDS LITTLE MACHINERY.

Only Tools Necessary Are a Scraper,
Wheelers, Carts and Road Plow.
Sand Is the Important Thing—Should
Be Clear of Soil.

The father of the sand-clay road in
America is the present county super-
visor of Richland county, S. C., and he
has a reputation for building lasting
roadways that is almost national. By
his example all the counties of South
Carolina have been enabled to under-
take the building of good roads. This
man is S. H. Owens, and he recently
completed one long stretch of thirty
foot wide sand-clay speedway over
which I have ridden in a heavy motor-
car at a speed exceeding fifty miles
per hour with scarcely a jar of the
machine—indeed, with more satisfac-
tion than over many of the very best
roads in England and in France over
which I have motored.

Convicts are worked in gangs of
twenty-five, and they are housed in
comfortable tents. The food bill is
12½ cents per day per man. This gives
a substantial bill of fare—corn bread,
flour bread, bacon, always vegetables
in season and beef twice a week. This
is accomplished by strict economy in
management, and the men do not suf-
fer for lack of sufficient food. The
striped suits cost \$2 per suit, and each
suit lasts from three to four months.
The shoes cost \$1.50 per pair and the
underwear 75 cents per suit, each last-
ing about three months. Each squad
of twenty-five convicts has one over-
seer, four guards and ten head of
mules, which are usually fine animals.
The real cost is in the feeding of the



MAKING A SAND-CLAY ROAD.

(From Good Roads Magazine, New York.)
mules, this amounting to about \$16
per month per mule. The squad oper-
ates one road scraper, costing \$250;
one dump wagon to each pair of
mules, five "wheelers" (two wheel
scrapers) and a supply of shovels. No
roller or harrow is used, such imple-
ment having been found unnecessary.
The mixing of the sand and the clay
is accomplished by the passage of traf-
fic over the surface. The total cost of
construction of one mile of the best
thirty foot wide sand-clay road, taking
all the above items into considera-
tion, is not over \$400 per mile as an
average. The cost of maintenance does
not average over \$10 per mile annually
if the repair work is done constantly.
If the season is a rainy one the repair
work should be done once a month. A
floating gang of two or three men, all
that is necessary, is maintained for
this purpose. With the two or three
men four or five miles a day can be
put in perfect condition.

In a personal letter to the writer Mr.
Owens presents the following facts re-
garding his methods of constructing
sand-clay roads:

"As requested, I will give you a
short sketch of the sand and clay
roads of Richland county. In January,
1889, I took charge of the roads of
Richland county, which were then in
deep sand in two-thirds of the county,
the balance being through sticky clay
hills, with the exception of about two
miles of macadam road which had
proved too expensive for our county to
continue to build.

"I commenced covering the sand on
the old Camden road with clay to
about ten inches in depth. At first the
people were displeased. It had rained
a great deal, and they were not ac-
customed to seeing muddy roads. I con-
tinued to throw sand on the clay until
it quit bogging and sticking to the
wheels, keeping it crowned with an
ordinary road scraper. After I had
built a few miles of the road and it
became smooth and hard the people
were delighted.

"As to the method of building, the
first thing to do is to grade the road
and give it a very slight crown, not
over two inches to every ten feet from
center to ditch. Then the clay should
be put on six inches deep, then sand
on the clay as clear of vegetable mat-
ter as possible. This keeps down the
dust. It depends entirely on the qual-
ity of clay as to the necessary amount
of sand. If it is pipe clay or chalky
kaolin it requires a great deal more
sand, which has to be applied after
each rain until the clay stops cutting
or bogging. The ruts should be kept
closed and the proper crown kept on
the road with a road machine until it
becomes hard. The important thing
is the sand. It should be as clear of
soil as possible. If the sand is fine
and badly water worn the result is
not as good.

"As to the cost, that depends entire-

ly on the haul of the clay. In real
genuine sand hills, like portions of
Richland county and Lexington, where
clay can be found by digging pits on
the hillsides or in the bottoms, it costs
about \$400 per mile for a thirty foot
road. Where the clay can be found
near the roadside and often in the
ditches by digging two or three feet
it is very much less.

"Gravel roads are often mistaken
for sand and clay roads. They are as
old as macadam, and it does not re-
quire the skill and care to build grav-
el roads that it does those of sand
and clay, especially where the clay
changes from half sand and half clay
and from that to a red, sticky clay
and sometimes a white chalk or stiff
pipe clay. It requires close attention
in the application of the sand where
this is the case. I have had as good
results putting sand on clay roads as
I have clay on sand.

"As to the durability of the sand and
clay roads, they will last as long as
macadam. There are stretches of
sand and clay roads in Richland county
where they are level that are in
good condition that were built ten
years ago, while the macadam road
built to Hyatt's park twelve years ago
was entirely rebuilt last year. I would
say my experience is that automobiles
improve sand and clay roads. I think
the opinion of all road experts is that
they damage macadam very much.
Since the automobiles are here and
more are coming every day it is ab-
solutely necessary to widen our roads
to at least thirty feet.

"One thing I would like to mention—
that is, in building sand and clay roads
very little machinery is needed. I have
never used a roller. All the tools that
are necessary are a road scraper,
wheelers, dump wagons or carts and
the road plow. There are no drains.
The crown extends to a "jaw" at the
roadside which carries all the surface
water better than a cut drain. Through
swampy places the roadbed is raised
and underdrained."—E. J. Watson,
Commissioner of Agriculture, Com-
merce and Industries, in Good Roads
Magazine.

GOOD ROADS AND ECONOMY.

Impassable Highways Cost American
Farmers Untold Millions.

There is no difference among well
informed people as to the cost of bad
roads, nor is there any longer a ques-
tion as to where the burden of the
cost is most severely felt. There are
hailed over the country roads of the
United States every year 255,000,000
tons of produce, equal to 30 per cent
of the railway tonnage of the coun-
try. The average haul from farm to
railway is 9.4 miles, and the cost per
ton per mile is between 23 and 25
cents. In Germany over better roads
the cost is 10 cents per ton per mile
at the maximum and 7 cents per ton
per mile at the minimum. The loss
suffered by the American farmer and
consumer, figured on the basis of the
German wagon road toll, is immense.
If it were saved from year to year
it would soon constitute a fund suf-
ficient to improve all of the common
highways of the country.

L. W. Page, who has collected a
great deal of valuable information on
this subject and who talks about road
improvement intelligently and reason-
ably, is not among those who clamor
for the federalization of the highways.
On the contrary, he deprecates the all
too prevalent idea that nothing can
be done in this country until the fed-
eral government puts its hand to the
wheel or its hand into its pocket.
The states, in his opinion, should take
the initiative or at least prove their
sincerity by setting an example for
the national government.

NEEDLESS WEARING OF POADS

If Automobile Traffic Would Spread,
Highways Would Last Longer.

A country surveyor protests against
the habit which many motorists have
of doing the majority of their driving
on the crown or center of the road.
This method of driving means that one
portion of the road takes all the wear
and, naturally, of course, gets worn
into ruts and ridges.

If the traffic would spread itself and
make all that portion of the road from
gutter to the top of the crown take a
share of the wear, road surfaces would
last much longer and would require
less frequent repair. In these days,
when roads are made almost flat, there
is no excuse for this habit of clinging
to the crown, but where roads are
made with a great deal of camber it
is perhaps excusable, as driving on a
continuous slope is the reverse of
pleasant.

Let Good Roads Come Quickly.
It is planned by the good roads as-
sociation of Spokane county, Wash.,
with the co-operation of the state good
roads association, county and township
organizations and property owners
along the route, to build a modern
highway, bordered with a continuous
line of shade trees, between Spokane
and Coeur d'Alene. Such a road would
be of direct benefit to thousands of
people, urban and rural residents alike,
and would also be a valuable object
lesson for the people of the surround-
ing country, who as time passes are
becoming more deeply interested in
the vital subject of good and perma-
nent highways. It is hoped the pro-
posed road will materialize and prove
the wisdom of its construction in such
a way as to cause the idea to spread.

Good Roads Mean Money.
The people need to be educated to
the fact that money spent for good
roads is not money thrown away,
whereas money spent for makeshift im-
provements is worse than thrown away.



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year as they needed more trees. If our trees
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our trees. They are our references—and
the best references a nursery company can have.

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