nings of life heretofore denied to many of them. The fears that hold
that he employ science as developed in the last 25 years and make
some because of the want or a ready market and of prices being less
than the cost of production will disappear when people reflect that
those conditions are purely temporary; and that they are due to the
fact that a large part of the world has been bankrupt and credit
has been destroyed. A new era is at hand. The world is now build-
ing new economic structures and new social conditions are arising
from the ashes of the old, all of which presage a brighter future.

THE ENGINEER MEETS THE FARMER
Jerry Donohue, Sheboygan, Wis.

The title of this paper might properly be broadened into En-
gineering and Farming for the officers of this society have extended
to me the privilege of discussing some of the problems relating to
engineers and farmers, calling attention in a general way to things
that both the municipal engineer and the farmer are interested in.

It has been my pleasure during the past few years to attend
several meetings between legislative bodies composed principally of
farmers, and civic clubs made up of men interested in the industrial
life of their respective cities. At these meetings the subject of the
relations between the farmer and the city man was generally dis-
cussed and the thought was usually emphasized that there should
be a better co-operation between the farmers and the city folks for
such co-operation would naturally result in a better understanding
of each others problems.

The farmer is the producer, and city people usually are the con-
sumers. In order that the farmer may produce a maximum crop
on his farm and dispose of it profitably it is absolutely essential
use of his land to it's utmost productive ability. Engineering and
farming have both advanced during the past 25 years. Farmers
are now taking advantage of the efficiency of improved farm
machinery. They have cleared their cut-over land by modern
methods, and under scientific supervision they have drained the
low areas in their fields, thus increasing the intrinsic value of their
farms. They have adopted practically all of the improvements
formerly enjoyed only by the residents of some of the larger cities.
The farmer today may have practically all the comforts of a modern
city home, and even the most modest of country houses now have
conveniences unknown to Royalty 100 years ago. Modern demand
and scientific industry have placed the bath tub in the most un-
pretentious homes and when we stop to consider that George Wash-
ington did not have one either in his mansion at Mt. Vernon or in
the White House while he was President, we begin to appreciate
some of the strides that have been made in sanitary conveniences.

Demands for these improvements by the farmer have opened up
new fields for the municipal engineer. City engineers have strug-
gled for years with problems involving the design and construction of sewerage disposal plants, water works systems, pavements, and city planning, but it was only quite recently that municipal engineers were called into the rural communities at the request of the farmer, who is now insisting that he, too, be given these improvements. The farmer wants good roads, he wants his family to enjoy the same things that his city cousins enjoy, providing they can be had without putting a mortgage on his farm. The construction of these improvements for the farmer has put the engineer in continuous touch with his requirements and the engineer is very glad to discuss these problems with him. The farmer appreciates the value of good roads and would like to have the highway that his farm is located on improved so that it would cost him less to transport his farm produce to market.

The same comparison as to the advance in modern sanitary engineering over the practices of 25 years ago applies equally well to transportation. Transportation enters into the cost of everything we consume. If modern transportation had not been developed to enable people from distant points to dispose of their surplus then we would still be existing as the people of the 18th century existed. The home undoubtedly would be the manufacturing center, and all of the goods made and crops produced would be consumed by the family. The head of the family would have to solve the engineering problems, the production problems, the construction problems, and all other problems pertaining to food, shelter, and clothing. And if this method were in practice now most of our modern municipal engineers would be kept busy sawing wood, tilling the fields or hunting to provide their own food, shelter, and clothing. Modern science, however, has given to the farmer the improvements that all must have under our present standard of living and the modern engineer has been invited in to discuss the design and construction of such improvements that any farm today must have to keep the family contented and make the farm a real producer.

The first of these improvements that the farmer became interested in was a system of drainage. Perhaps he did some ditching which resulted in reclaiming certain parts of his farm. At least he installed an under-ground outlet which carried the water away from the kitchen sink to the nearby creek and later he began installing tile to drain his land. This finally resulted in his having a comprehensive tile drainage system outlined for his farm. After he put his land upon this improved basis he gave some attention to the comforts of his family and he installed a sewer which permitted him to put in a bathroom and other house conveniences. This, of course, required that he pipe his house for water and the old oaken bucket which used to drop into the open well was replaced by a pump connected to a drilled well from which an abundant supply of pure water could be obtained. This pump used to be connected to a gasoline engine which supplied the necessary power pressure for his
house, water works system. Later he replaced the gasoline engine with an automatic electrical driven unit. This electrical unit of course required that he purchase a modern farm lighting plant or connect on to the nearest high tension line. This permitted him to install electric lights in his house and barns, motorize his dairy equipment, and give his family and help the convenience of electric light and power.

The most recent improvement extended to the farmer is gas service from the nearby city gas plant. Gas, under a high pressure distribution system can now be forced as far as 40 miles from the central plant and the farmer has been given the opportunity of connecting into these distributing mains and his kitchen now contains a modern gas range.

In connection with the study of these improvements the farmer has had his attention called to certain political controversies which quite recently have stimulated research along the line of drainage and sewerage problems. Those of you who happen to live in Eastern Wisconsin are perhaps more interested in the present controversy of lake levels than those who live in Central and Western Wisconsin. It is well, however, to call this convention’s attention to the Chicago drainage situation for all farmers are interested in these facts. Chicago, by adopting the diutrition system of sewage disposal at a time when that system offered the easiest remedy of her sewage problem, has at the present time aroused the indignation of all of her sister cities on the Great Lakes by demanding that she be permitted to take water enough out of Lake Michigan to so dilute this sewage as to carry it down the Illinois River to the Mississippi River. The amount of water being taken, is equivalent to the combined discharge of the two largest rivers flowing into Lake Michigan and this flow of water and sewage has damaged the farms in Central Illinois, putting their drainage systems out of commission, polluting the water of the river, destroying the fishing industries, and summer homes all because the selfish interests of a great city did not in time make provision for reducing this sewage in a disposal plant which would make it unnecessary to take this volume of water.

The rights of others must be respected. If the Great Lakes were a deposit of coal instead of water and Chicago had been permitted to tunnel into that mass of coal to promote her own particular interests, then the country at large could appreciate the injustice of such an act. Mr. Farmer in Western Wisconsin is interested in this problem because in a way his own farm may be compared to Chicago. If he throws his refuse and sewage down onto his neighbor without first purifying it his neighbor has the same grievance that the farmers in Illinois have. If Mr. Farmer, in order to do this, has to pump water from the nearby lake in such quantities so as to affect the level of that lake and damage to the property of the riparian owners on the lake, Mr. Farmer is in the same position
that Chicago is in with reference to the level of Lake Michigan and its resulting relations to transportation on the Great Lakes.

The farmer, however, is more interested in his own individual problem than he is in the controversy that may now exist between Chicago and her neighboring municipalities. He is more interested in meeting the municipal engineer and discussing some of the problems with him relative to the improvements that are now necessary to make his farm one of the best in the section. He may also be interested in meeting this same engineer and discussing the installation of some of these improvements in the village that a part of his farm happens to be located in. I have found in my work in Wisconsin that the farmer is generally found on the Village Board and that although he may be conservative in approving of expenditures for public improvements, still, after proper deliberation, he is always convinced that when public funds are spent judiciously his village should have the benefit of any improvements that the taxpayer can afford to authorize.

May the municipal engineer continue to meet the farmer in the progressive days of the future. May the engineer enjoy the wonderful inspiration exemplified by the progress that the farmer has made in the past 25 years, and may the farmer invite the assistance of the engineer to help make a scientific analysis of some of these problems that are continuously arising on the farm and may their solution result in a more prosperous farm and a happy relationship among those destined to enjoy the improvements of the future.

SURFACE INTAKES IN DRAIN TILE
J. J. Degen. Burlington, Wis.

Burlington, Wis., Feb 9, 1926

Wisconsin State Drainage Association:

Gentlemen:

First, I wish to state that I am sorry I cannot be with you today in person, especially so, after receiving such an appealing invitation from Prof. Jones, but at this particular time, due to various reasons, I am unable to leave Burlington. So please permit my pen to fill my place on this occasion.

The subject which I am to meditate upon is Surface Intakes for tile drain. I might say it is that particular part of a drain given the least consideration when a drainage improvement in contemplated. I have often noticed, in going over drainage projects, that few, if any, intakes are built, and usually those built express in their construction the little importance given their necessity. First, a poorly, haphazardly built intake is a detriment to the drain rather than a benefit as it permits earth and weeds to enter tile drains, for which purpose the drain was not intended. Second, I often find a hole cut in the tile, which naturally weakens the tile. Plus this fact the intake is supported upon the same tile by method of using