cash value of the land to be taken for the right of way for the ditches and drains, or the damages that will be done thereto by reason of the improvements under the power of eminent domain, then the court must grant a jury trial when demanded by the land owners . . . under the Missouri constitution. Several Missouri cases are cited as sustaining this, among which are Land & Stock Co. vs. Miller, 94 S. R. 727; S. C. 70, S. W. 721; and S. C. 60 L. R. A. 190.

Many courts hold that there is no common law right to trial by jury on damages in eminent domain and condemnation proceedings, but we do not ask for that change in this bill.

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WHAT DRAINAGE MEANS
ED REICHENBACH

Drainage Engineer and Contractor, Jefferson, Wisconsin

TEXT: Large crops on little tile drains grow,
Rich virgin soil runs deep and low,
Whole fields alive with stock and grain,
Net surplus funds the farmers' gain.

Seekers for fairer climes usually come back to Wisconsin and say "Wisconsin is good enough for me." Blessed with liberal sunshine, well supplied with good water, and built upon a strong soil, her agriculture has prospered.

The bountiful resources of the virgin soil yet remaining uncultivated still await the hand of the younger generation to render still further prosperity among farmers.

The marvelous growth of the dairy industry, and the vast production of clover, corn, and alfalfa, as well as the numerous herds of high class cows and prize winning sheep, are gradually and surely bringing the state into general prominence.

Although Wisconsin is scarcely as old as the average eastern state, her recognized prominence in agricultural pursuits was accomplished by developing but a part of her vast resources. Many
hundred thousand acres of virgin soil still remain waiting for the plowman to turn the first furrow. And foreclosure of farm mortgages is quite unusual.

DRAINAGE SHOULD BE ENCOURAGED.

Among the native resources capable of profitable development the drainage of wet land deserves more encouragement than is accorded it by farmers. Agricultural meetings conducted by some of the more progressive class of farmers who meet to learn and teach improved methods, have exemplified numerous practical demonstrations of profitable results derived from tile drainage on their own farms. And the marked advantages thereby created are the legitimate profits acquired as ample reward for judicious foresight and diligent devotion to a practical cause.

Usually the soil requiring drainage is the most fertile, and is particularly adapted to grow corn and clover, the prime feed for dairy stock. And since several thousand miles of tile drains are laid in Wisconsin, evidence to sustain the claims made for drained land may readily be obtained. The drains work day and night and even during the winter when necessary. Frost does not injure them and the cost of their maintenance is nearly nothing.

To encourage the introduction of tile drainage among farmers who are unfamiliar with the subject, practical examples of successful results are necessary. Ample opportunities exist for personal observation where various systems of drainage have been in successful operation long enough to demonstrate their utility as a permanent improvement.

FRUGALITY AND ENERGY ESSENTIAL.

To those of the present generation who decline frugal economy and fear hard work, the essential energy and patience required to reclaim wild land seems an irksome task. Vain ambition to obtain something for nothing is a bad form of idle purpose. Primitive methods of the pioneers combined with more irksome toil and cheaper living than the present generation would tolerate, proved successful in the long run. And although human modes have changed and land values advanced and the younger genera-
tion needs and obtains advanced education, the merits of old time
diligence and frugality are good as ever. Education and modern
machinery tend toward making farming a comparatively pleas-
ant occupation. And with knowledge of possible results the re-
claiming of new land becomes interesting. The independence
and healthfulness of country life should be considered as an im-
portant feature in the results desired. While farming does not af-
ford sudden chances to leap from poverty to great wealth, as an
occupation it affords a gradual and sure advance and often per-
manent prosperity.

DRAINAGE WARMS THE SOIL.

The removal of excess water from the soil is followed by pene-
tration of fresh air into the open pores of the soil vacated by
the soil water. This action repeated renders the soil porous and
mellow and warmer, and hence the change is conducive to vigoro-
ous plant growth. This result is a prime factor contributing
merit to the theory of drainage. The roots of ordinary farm
crops cannot thrive without air; and without thrifty roots plants
can not attain mature growth. Neither can roots of cultivated
crops survive continued contact with stagnant water. Try the
experiment of planting farm seeds in a jar filled with soil; seal
the surface air tight after the plants extend above the jar. Or
keep the ground constantly saturated with water.

In northern climates early warmth of the soil is essential to
timely growth of leading farm crops, and by thorough drainage
this result can be accomplished in wet land. Early in the plant-
in season in the north, when field work is in active operation,
tile drained soil is about thirteen degrees warmer than the soil
water three feet below the surface in similar soil. The difference
is greater as the season advances. The soil water retains a cool
temperature longer than the air in spring.

During the winter and early in spring when the ground freezes
and thaws alternately, tile drainage prevents the surface from
heaving. And therefore prevents destruction of plant roots.
Clover roots penetrating below the point of frequent thawing are
torn apart by the surface heaving, while the lower ends of the
roots are held fast by the frozen ground.
TILE DRAINAGE 200 YEARS OLD.

Tile drains were laid in England before our grandfathers were born. Underdrainage with tile was first introduced in the United States about seventy-five years ago, the tile being imported from England. At the present time there are more than two thousand tile factories in operation in this country. And what does this mean? Who buys the vast product of so many factories? And what does it signify? If such investments were unprofitable, persons thus engaged could not continue half a life time in their business. And while these historical facts stand as a public exhibit of great magnitude, many farmers whose land requires drainage would not take the trouble to investigate the valuable results accomplished.

In southern Wisconsin the present market value of many wet marshes, with the cost of drainage added, is less than half the estimated value of adjacent improved farms. Numerous actual examples proclaim the merits of tile drainage as a permanent investment. Well burned tile properly laid will endure forever, with reasonable care.

Any other improvement on a farm is of temporary duration and requires repairs or renewal occasionally, owing to natural causes. Tile drains properly laid directly increase the value of the land in proportion to the increased yield of the soil. Besides it is gratifying to observe the improved appearance of the land.

DEPTH, SIZES AND PLANS.

If the water table or surface of the soil water remains within three feet of the surface of the land during the growing season, then the land requires underdrainage. The requisite distance between drains depends upon the character of the soil, and also the extent of thoroughness desired. If the surface is two to three feet above the normal height of the outlet, good results can be accomplished. Deep drainage is generally best. But shallow drainage is much better than none. If you cling to the theory of great depth, perhaps you may find much of your land situated too low to enable you to put your theory into practice. And further, you may observe successful results from numerous soils drained shallower.
The cost of construction is materially affected by greater depth when the lower strata is composed of gravel, stones, or wet loose sand. If obstructions at greater depth are numerous, then drains laid nearer together and at less depth are commendable.

STUDY LIVING EXAMPLES.

To those interested in the drainage or purchase of wet land, I would suggest communication with prominent farmers who have extensive systems of tile drains laid in accordance with approved plans under competent supervision. Their advice based upon actual experience will help to guard against error. Personal visit to drained farms are most impressive. The interest on the usual cost of tile drainage per year is about $1.80 an acre.

Forward march, advance in line,
Drain your land and work it fine,
Sound the word that thrift will win,
Till the soil to fill your bin.
Proper Drainage Insures Good Crops

PROPER DRAINAGE WILL GREATLY INCREASE THE VALUE OF YOUR LAND

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